



---

# Status, Challenges and Trends in Videoconferencing Platforms

A.M. Suduc, M. Bizoi, F.G. Filip

## Ana-Maria Suduc\*

Valahia University of Targoviste  
Aleea Sinalia 13, 130004, Targoviste, Romania  
\*Corresponding author: [ana.suduc@valahia.ro](mailto:ana.suduc@valahia.ro)

## Mihai Bizoi

Valahia University of Targoviste  
Aleea Sinalia 13, 130004, Targoviste, Romania  
[bizoi@valahia.ro](mailto:bizoi@valahia.ro)

## Florin Gheorghe Filip

Romanian Academy  
Calea Victoriei 125, Sector 1, 010071 Bucharest, Romania  
[fflip@acad.ro](mailto:fflip@acad.ro)

## Abstract

Although videoconferencing platforms were a growing market even before the Covid-19 pandemic, they became very popular and widely used within weeks of the beginning of the pandemic. The compulsion of social distancing, lockdown, the need to work from home have led to an exponential demand for videoconferencing applications and an adaptation of the way we carry out our current activities such as work, decision-making, communicating with family and colleagues, or education. With the diversification of the categories of users of videoconferencing systems and the contexts in which they were used, many other needs have emerged and the demand to adapt these platforms, both in terms of ease of use and functionality, as well as security. Videoconferencing systems are no longer meant only for decision-makers or trainers, but also for general public. This paper reviews various data regarding the use of videoconferencing systems in recent years, a number of problems encountered by users, and expected trends in the future.

**Keywords:** collaboration technologies, decision support platforms, pandemic, virtual meetings.

## 1 Introduction

A collaborative group consists of a number of members who work together to achieve a common set of objectives by carrying out activities and using specific procedures and techniques [10]. Communication has always been one of the main enablers of an effective collaboration. It can be synchronous or asynchronous. Synchronous communication has traditionally involved face-to-face or online meetings of group members who are placed in the same or different locations, respectively. Although, before the pandemic, there were quite a few companies that regularly held online or hybrid meetings for decision

making and problem solving (some using dedicated Group Decision Support Systems or Computer Supported Cooperative Work systems [8] [4], most of them mainly, if not always, held face-to-face, same-place meetings. In the pandemic period, companies were forced to go online. In order to continue operating effectively, businesses have had to develop new procedures for decision-making and communication. At the same time, the digital platform technologies (such as Big Data, Internet of Things (IoT) and cloud computing) and working style are spreading as wildfire and contribute to the progress towards a platform society and economy [5]. As statistical data and analyses witness, the ever-growing market for videoconferencing platforms, it is useful to evaluate the current state and identify the trends in this area so that we can adapt ourselves to the new situation and see how we can integrate the appropriate tools with the view to increase work efficiency. This paper reviews various statistical data on the use of the most popular videoconferencing platforms in recent years and present the results of comparisons of these systems made by various authors in the literature. A number of challenges encountered by users of videoconferencing systems and the main promising trends in the development of such systems and corresponding enabling tools, that are expected to have a significant impact on the way we communicate and make-decisions in the future, are also presented.

## 2 Current status on the most popular videoconferencing platforms

Covid-19 experience has shown that online meetings are a viable and rather acceptable alternative to face-to-face and same-place meetings. Prior to the pandemic outbreak in 2020, working from home has not been too widespread. Videoconferencing platforms have regularly been mainly used by a range of users such as policy makers and trainers. With the new needs that have emerged in recent years due to the pandemic context, companies, public administration offices, education institutions, and various people had to imagine new solutions. Unified communication and collaboration tools such as Zoom, Microsoft Teams, Cisco Webex, GoToMeeting or Google Hangouts/Meet saw an increase in demand when remote working intensified following the COVID-19 outbreak in 2020 [38]. Such tools have been largely adopted, in all fields, for both professional and personal purposes since the early months of the pandemic. Although pandemic conditions no longer force using virtual meetings, due to the many advantages identified and experienced, many businesses still prefer to use videoconferencing instead of face-to-face, same-place meetings. In 2021, companies' top IT investment priorities to support working from home have been based on cloud-based technologies and digital collaboration tools [29]. Today, videoconferencing platforms represent the increasingly popular means of communicating with business partners, friends, colleagues, and family members and a convenient and broadly used way to provide education. Videoconferencing platforms that include tools tailored for different categories of meetings can make possible a higher productivity in teams or efficiency in learning by facilitating collaboration, problem solving or decision making.

### 2.1 Strengths

Over the years, various authors have analysed the different advantages and disadvantages of videoconferencing platforms and remote working in geographically dispersed work teams. As one may expect, the main advantages are related to costs (e.g. meeting materials and office expenses, travel costs, and so on) and time savings. According to [33], communication and decision-making performed by using virtual meetings can be achieved in a shorter time and more efficient way. That explains the early trend of companies to use videoconferencing solutions in order to facilitate decision-making and reduce the costs associated with holding physical meetings. Sometimes the option of a face-to-face and some-place meeting may not be possible or desirable. In such situations, online meetings could ensure that the necessary tasks and processes are accomplished. In addition, agenda-driven online meetings tend to be more productive and efficient, partly due to the sense of urgency given by the shorter online attention spans and also because there is less table talk and more productive conversation. According to [28], a significant percentage of 57% of business professionals felt that in working remotely during the pandemic, in 2020, their productivity was higher than before. Only 17% of them considered themselves less productive and 24% did not notice a difference. Virtual meetings have become universally accessible, and the convenience of having members from the same or different companies in the same

meeting from any location is also a great benefit of online meetings [19]. According to [24], the best videoconferencing apps offer high picture and sound quality and include essential features for initiating and managing online meetings (e.g. easy meeting scheduling, collaboration features, meeting recording). Following testing of 30 videoconferencing apps, Pot [24] identified five best videoconferencing platforms in 2022, each of which, according to the author, is recommended for certain usage settings of use or the quality of certain attributes. They are as follows: a) Zoom (for reliable and large video calls), b) Google Meet (for Google Workspace users), c) Microsoft Teams (best combination of team chat and videoconferencing app), d) Whereby Web (best videoconferencing app for an easy option), and e) WebEx Meeting (for video quality). There are numerous authors who have made various comparisons between different videoconferencing systems, taking into account attributes such as the functions offered, the devices on which they operate, the size of meetings or their prices [34]. In the analysis carried out by [31], using different parameters as a basis for comparison, the three most popular videoconferencing platforms are in most cases placed on an equal footing with each other. In terms of video quality alone, Microsoft Team stands out, and Zoom stands out in terms of meeting recording and local recording storage. Suduc & Bizoi [34] developed a list of strengths of the three most popular videoconferencing systems, as highlighted in the literature, considering seven criteria such as: (1) performance and reliability, (2) meeting size (number of participants), (3) integration, (4) security, (5) platforms (supported devices), (6) best features, and (7) what they are best suited for (“best for...”). Table 1 shows the features identified by Suduc & Bizoi according to the classification made in [34], to which other features from other comparisons in the literature have been added [3][31].

Analysing the results, it is difficult to conclude that one platform stands out from the others in terms of any of the criteria analysed. The situations/contexts in which platforms are commonly viewed as the most suitable may tip the balance in choosing one product over another. According to the results obtained by [34], Zoom is the most suitable platform for education and for contexts where users only need audio/video communication and less for other tools. Many authors consider Google Meet to be the natural and best choice for Google Workspace users. There are currently over three billion Google Workspace users [12], of which six million are paying business users [1]. Google Meet therefore targets a very wide audience. However, Google Workspace is the second most popular project management tool after Microsoft Teams [1]. [34] place Microsoft Teams as the best videoconferencing platform for Microsoft 365 users, education and corporate settings. Microsoft Teams also has an impressive number of users, reaching more than 280 million monthly active users in the second quarter of 2023 [14]. Such systems offer similar functions, which makes choosing one platform over another a difficult task. As shown below, the moves made by major videoconferencing platform providers to embrace interoperability will apparently make life easier for users.

## 2.2 Statistics on the use and market of videoconferencing systems

The global market for videoconferencing platforms is expected to grow significantly in the coming period, from USD 7.65 billion in 2022 to around USD 18.56 billion in 2030. This growth is driven, according to [25], by the trend of remote working, geographically dispersed operations and due to globalization.

In January 2022, up to 78% of US corporations used videoconferencing software routinely, and a little over 58% of companies did so daily to keep operations running. According to recent surveys and studies 89% of employees, especially those who work remotely, said they feel that video conferencing helps them feel more connected with their colleagues and at home in their company [32].

The period that marked a boom in the use of videoconferencing platforms was the beginning of the pandemic. According to Sydow [35], during the week of March 15-21, 2020, there were 62 million downloads, 45% more than the previous week, of business apps from the App Store and Google Play.

Compared to the weekly average for the first four months of 2019, video conferencing apps were downloaded dozens of times more the week of March 15-21, 2020. For example, Google Hangouts Meet was downloaded 24 times more in the UK, 30 times more in the US and 140 times more in Italy. Zoom and Teams also saw significant increases, with varying figures from country to country. This growth continued into the second half of 2020 and beyond.

According to Smart Systems [32], Google Meet had over 100 million daily video conference partic-

Table 1: Strengths of the most known videoconferencing systems as reflected in the literature (after [34])

	<b>Zoom</b>	<b>Google Meet</b>	<b>Microsoft Teams</b>
Performance and reliability	-reliable calls	-clear, consistent, and reliable video experience	-great video quality
Large video calls	-up to 1000 interactive participants via Zoom Large Meetings add-on	-up to 250 participants interactive participants, and up to 100,000 viewers via live streaming in the domain	-up to 1000 interactive participants
Integrations	-integrate with Learning Management Systems -dozens of integrations and add-ons	-integrate with Google apps	-integrate with various add-ons and apps -integrate with Microsoft apps -integrate with Learning Management Systems
Security	-two-factor authentication -End-to-end encryption -waiting-room	-two-factor authentication -eDiscovery	-two-factor authentication -Microsoft Advanced Threat Protection -Data Loss Protection -eDiscovery
Platforms	-macOS, Windows, iOS, Android, Web	-iOS, Android, Web	-web, macOS, Windows, iOS, Android, Linux
Best features	-screen sharing (multiple options) -breakout rooms -Participant Reporting feature	-live captioning for audio and video chats -screen sharing options and controls -dial-in for free with any of paid plans -clear and straightforward interface	-video quality -breakout rooms -Together Mode -best whiteboard -best track record of security and the most transparent privacy policy -all-in-one collaboration hub -automatic captioning
Best for...	-education -users who need only video conferencing	-Google Workspace users	-Microsoft 365 users -education -corporate settings

ipants in 2020, and, by 2021, there were approximately 250 million daily active users on Microsoft's virtual meeting platform, Microsoft Teams. Cisco WebEx is one of the current top videoconferencing platforms this year (2022), with about 325 million daily users citeSmartSystems2022.

From the data it had concerning the perceived buyer interest, TrustRadius has made a list of top leaders in the video conferencing market in 2021 [28]. In 2021, Zoom has 50% of the video conferencing market, followed by Microsoft Teams (23%), Webex Meetings (11%) and Google Meet (4%).

A study on the market share of videoconferencing applications in 2022, worldwide [37], conducted in 2022 with 4495 respondents, presents Zoom as the leading videoconferencing software (55.44%). Second place was taken by Microsoft Teams (20.93%), followed by GoToMeeting (12.88%), WebEx (9.43%), RingCentral (5.67%) and Google Meet (5.32%).

Another report on popularity of video conferencing platforms in 118 countries can be found in [2]. According to the report, Zoom is the leading videoconferencing platform in 80 countries (66% of countries surveyed), followed by Google Meet (28 countries) and Microsoft Teams (7 countries). According to the above author, Microsoft Teams has lost a lot of popularity from 2021, when it was the most popular app in 41 countries, to just 7 in 2022.

From all these data, it can be concluded that the main competitors in videoconferencing systems are Zoom, Microsoft Teams, Google Meet and Webex.

### 3 Videoconferencing challenges and issues

Between 17 March and 5 April 2021 [30], a survey was conducted, worldwide, to find out what challenges respondents encountered in video meetings when working remotely in 2021. The main challenges of online meetings indicated by the 2181 respondents were: a) encountered technical problems (for 58% of respondents), and b) fatigue associated to a large number of online meetings (28%). Other challenges that were indicated by significant percentages of respondents to the above survey are: a) difficulties associated with non-verbal communication (28%), background distractions (26%), awkwardness of small talk (22%), difficulty intervening politely in the discussion (19%), difficulty meeting start times (13%), difficulty of collaborating/interacting (12%), screen sharing issues (11%), and inefficient and unproductive meetings (11%).

According to the Remote Work Report 2020 of Owl Labs [23], the biggest challenges related to working from home for 62% of the total of 2025 respondents (full-time US workers) were interruptions and talking over others. The second biggest challenge for respondents (59%) was the background distractions from other participants. For example, 57% of respondents had difficulty staying focused. A significant percentage of respondents also indicated technical issues as challenges: audio quality (57%), video quality (56%), Internet speed or connectivity (52%) and meeting setup (50%). A detailed analysis of the various challenges that users typically experienced in virtual meetings during the pandemic can be found in [15].

According to [17], in working from home, the boundaries between daily life and work have become quite blurred which has led to many difficulties, especially distractions. Lee et al [17], in their study, analysed different situations in which videoconference participants were distracted by various factors. The distracting experiences identified were generated by both the technical equipment/videoconferencing system and by people/pets/work space in the meeting or the user's physical environment. The participants to the study indicated also several possible videoconferencing improvements to help them to deal with the distractions: (1) higher quality virtual backgrounds in which the user's face is detected and everything but that face is processed (hidden), (2) a status selection function (e.g. away for a period of time) that can easily be used when other more important situations outside the meeting require the user's attention, (3) a wider range of integration between applications and devices allowing them to deal with different situations in the environment without having to leave their seat during the videoconference, (4) video conferencing transmission of only the user's voice and cancellation of all other ambient noise, including other people's voices. As it can be noticed in the following section, major videoconferencing system providers are already working on smart features that will most likely significantly reduce distractions. For example, Cisco's Webex claims that its audio intelligence feature has, since its launch after the BubbleLab acquisition in September 2020 and

by June 2021, eliminated background noise from over 16 billion minutes of videoconferencing sound [16].

## 4 Future of video conferencing and Artificial Intelligence in video conferencing

In recent years, Artificial Intelligence (AI) - based technologies have become almost ubiquitous even though one can notice various concerns and fears expressed in the very recent newspapers and magazines [36][11]. After the initial wave of AI applications focused on internal efficiency, digital platform companies have been exploring the possibilities of using these innovations for new business opportunities. The role of AI has grown significantly over time, becoming the central part of digital platforms and even a platform in its own right [20]. And for videoconferencing systems, the use of AI technologies has grown in recent years and continues to grow.

According to Precedence Research [25], in the near future, the growth of the videoconferencing systems market will be influenced on the one hand by the integration of cloud, Internet of Things (IoT) and Artificial Intelligence technologies and, on the other hand, by factors such as the growing demand for video communication, e-learning and e-government.

Concerns in using AI to improve video conferencing systems have been around since before the pandemic. For example, Webex first introduced AI in 2017, when it added machine learning-based noise detection and speaker tracking, as well as camera framing of participants. Over the next few years, Webex continued to add new AI-based features that proved very useful. In recent years, AI - based methods have proven that they can contribute significantly to improving the user experience.

Various implementations of AI in videoconferencing systems are reported in the literature. Suduc & Bizoi [34] have listed a number of such AI integrations within Zoom, Meet, and Teams. In all three platforms, AI technologies are mainly aimed at video and audio enhancement (e.g. static or dynamic virtual background, video compression, autozoom, background noise suppression, de-reverberation, etc.), but also live transcription (e.g. live captions, auto translation, Speech-to-Text, summarisation, etc.) or integration with other applications useful in such virtual meetings.

The Cisco Webex platform also includes several AI-based features. According to [6], Cisco Webex has focused its efforts on using AI for audio and voice, bots and assistants, relational intelligence and computer vision for facilitating collaboration. In June 2021, Webex announced the latest additions to its artificial intelligence features targeting hybrid work namely: a) The Webex Assistant for Devices, which includes multiple voice commands in multiple languages, b) the "optimize for my voice" feature, which distinguishes between foreground and background speakers, and c) the "people insights" feature, which provides private data for each individual person to support better-informed decisions about meetings. Cisco Webex is also working on improving virtual background replacement and gesture recognition [27]. Webex videoconferencing software together with Webex devices offers a number of AI-based features that significantly enhance hybrid meetings. Dhingra [6] presents these features, in chronological order of their development and implementation. Some of these AI-based features are: automatic framing of talking participants, close-up images, people counting, presenter tracking, facial recognition with name labels, proactive collaboration assistant (proactively start a conversation), a personal in-meeting assistant, speaker labelling in transcripts and region of interest encoding [6].

A paper published by Mendes et al [18] presents a list of eleven situations in which AI could be used to address the needs that are commonly encountered in the usage of videoconferencing systems such as: a) verifying user identity, b) counting and possibly anonymizing participants, c) detecting user attention/engagement, or d) summarizing the meeting. Some of these use cases have already been analysed by providers of videoconferencing systems and partially or fully covered by specific features.

According to [13], AI could transform videoconferencing in many ways. For example, it can be used for: a) making predictions or suggesting useful applications or documents based on statistical data collected in meetings, b) video and audio enhancement, c) automated transcription/translation, d) use of bots, e) use of augmented reality and more. Experts expect that AI technologies will also be adopted in the future to improve and diversify the functions of videoconferencing systems.

An important aspect of the videoconferencing market in recent times is the openness of large

companies in the field to interoperability. Video conferencing interoperability refers to the ability of online meeting platforms to connect and communicate with each other to create the easiest possible user experience. To improve the overall experience of online and hybrid meetings, many videoconferencing platform manufacturers have embraced interoperability. For example, in October 2022, Cisco announced that company's hardware will support Microsoft Teams in the future. The users of Cisco Meeting devices and rooms can now choose to natively run either Cisco Webex or Microsoft Teams [7]. This interoperability also allows Microsoft Teams users directly within the application to schedule, access or cancel Webex meetings. Cisco Webex allows to schedule and join virtual meetings not only in Microsoft Teams, but also in Google Meet and Zoom from a Webex device with just a few clicks [39]. Poly solutions are interoperable with Microsoft Teams, Zoom, Cisco Webex, GoToRoom, BlueJeans, Dialpad, StarLeaf and RingCentral, and Neat hardware solutions with Zoom and Microsoft Teams.

Another important partnership, announced in September 2015, is between Cisco and Apple. As a result of this partnership, iPhone and iPad users have the ability to share either camera in Webex Meetings and annotate [21]. Webex Meetings for Apple CarPlay allows viewing upcoming meetings, joining, audio only, a meeting and playing a recording.

Interoperability of videoconferencing systems enables creating an improved user experience and has the potential to ensure better collaboration and increased productivity [26].

## 5 Conclusions

The way business works has undergone a notable change in the last two years. Videoconferencing has become one very visible enabler of the new normal, and this is having an impact on the productivity of companies, how they save resources, and how intra and inter communications are carried out. They provide an ever more effective and timely dimension of the contribution of information technology to improving human wellbeing and resilience [9].

Many institutions have chosen to use more than one videoconferencing platform for different purposes and situations within the same organisation [22]. Considering that 85% of organizations use more than one meeting platform and 62% of videoconferencing companies use more than three different videoconferencing software options [32], adoption of interoperability by many videoconferencing system manufacturers will facilitate and completely redefine the virtual and hybrid meeting experience.

Although companies, people and governments were taken by surprise at the start of the pandemic, they have had to adapt to the new conditions by rapidly adopting solutions that allow them to continue to operate. The providers of videoconferencing systems have had to meet a huge demand in a very short time. Manufacturers have therefore focused their efforts on responding promptly to the different needs of users, enhancing existing functions and integrating new features and technologies. AI technologies have been among the most widely used technologies for developing videoconferencing systems in recent years. And in the future, Artificial Intelligence, along with IoT and cloud technologies, are expected to drive the growth of the videoconferencing systems market by improving user experience, productivity and efficiency of virtual meetings.

*An early and partial version of this paper was presented at ITQM 2022 conference and published by Elsevier in Procedia Computer Science, Vol. 214, pp. 288-294, under the title "AI shapes the future of videoconferencing" [34].*

## References

- [1] Abdalslam, A. (2023, April 13). 340+ Google Workspace Statistics, Trends And Facts 2023, [Online]. Available: <https://abdalslam.com/google-workspace-statistics>, Accessed on April 2023
- [2] Brandl, R. (2023, Jan 4), The Most Popular Video Call Conferencing Platforms Worldwide, [Online]. Available: <https://www.emailtooltester.com/en/blog/video-conferencing-market-share/>, Accessed on Feb 2023.
- [3] Brnakova, J. (2023, March 10), Comparing top video conferencing tools: Google Meet vs. Zoom

vs. Teams, [Online]. Available on Revolgy: <https://www.revolgy.com/insights/blog/comparing-video-conferencing-tools-google-meet-zoom-microsoft-teams>, Accessed on May 2023.

- [4] Cai, Y., Feifei, J. F., Jinpei, L. J., Ligang, Z., & Zhifu, T. (2023). A survey of collaborative decision-making: Bibliometrics, preliminaries, methodologies, applications and future directions *Engineering Applications of Artificial Intelligence*, 122, <https://doi.org/10.1016/j.engappai.2023.106064>, 2023.
- [5] Codagnone, C. (2022). The Platform Economy After COVID-19: Regulation and the Precautionary Principle, In *H. Werthner, E. Prem, E. Lee, & C. Ghezzi (Eds.), Perspectives on Digital Humanism*, Springer, Cham, [https://doi.org/10.1007/978-3-030-86144-5\\_24](https://doi.org/10.1007/978-3-030-86144-5_24), 2022.
- [6] Dhingra, A. (2020, Oct 12), Collaboration in the Age of AI: How Cisco is Pioneering the Use of AI and Emerging Technology Within Collaboration, [Online]. Available: <https://blog.webex.com/video-conferencing/collaboration-in-the-age-of-ai-how-cisco-is-pioneering-the-use-of-ai-and-emerging-technology-within-collaboration/>, Accessed on Feb 2023.
- [7] Enderle, R. (2022, Oct 13), The Microsoft-Cisco Teams collaboration could create an interoperability revolution, [Online]. Available: <https://www.computerworld.com/article/3676631/the-microsoft-cisco-teams-collaboration-could-create-an-interoperability-revolution.html>, Accessed on Feb 2023.
- [8] Filip, F. G., Zamfirescu, C. B., & Ciurea, C. (2017). *Computer-Supported Collaborative Decision-Making*, Springer, Cham, 2017.
- [9] Filip, F.G. (2021). Automation and computers and their contribution to human well-being and resilience, *Studies in Informatics and Control*, 30(4), 5-18. doi:<https://doi.org/10.24846/v30i4y202101>, 2021.
- [10] Filip, F.G. (2022). Collaborative Decision-Making: Concepts and Supporting Information and Communication Technology Tools and Systems, *International Journal of Computers Communications & Control*, 17(2), <https://doi.org/10.15837/ijccc.2022.2.4732>, 2022.
- [11] Hogarth, I. (2023, April 13). We must slow down the race to God-like AI, [Online]. Available on Financial Times: <https://www.ft.com/content/03895dc4-a3b7-481e-95cc-336a524f2ac2>, Accessed on May 2023.
- [12] Indah, K. (2023, March 1). How Many People Use Google Workspace in 2023? (NEW Stats), [Online]. Available on Earthweb: <https://earthweb.com/how-many-people-use-google-workspace/>, Accessed on April 2023.
- [13] Intellect Data. (2021, June 14). Video Conferencing and Collaboration: The Role of AI in Shaping the Future, [Online]. Available: <https://intellectdata.com/video-conferencing-and-collaboration-the-role-of-ai-in-shaping-the-future/>, Accessed on Aug 2022.
- [14] Iversen, B., Nadella, S., & Hood, A. (2023, January 24).. Microsoft FY23 Second Quarter Earnings Conference Call, [Online]. Available on Microsoft: <https://www.microsoft.com/en-us/Investor/events/FY-2023/earnings-fy-2023-q2.aspx>, Accessed on April 2023.
- [15] Karl, K. A., Peluchette, J. V., & Aghakhani, N. (2022). Virtual Work Meetings During the COVID-19 Pandemic: The Good, Bad, and Ugly, *Small Group Research*, 53(3), 343–365. doi:10.1177/10464964211015286, 2022.
- [16] Kini, S. (2021, June 9). 16 billion minutes of noisy distractions disappeared!, [Online]. Available: <https://blog.webex.com/video-conferencing/16-billion-minutes-of-noisy-distractions-disappeared/>, Accessed on Feb 2023.



- [17] Lee, M., Lee, S., Park, W., & Lee, S. (2022). Distracting Moments in Videoconferencing: A Look Back at the Pandemic Period, *CHI '22: Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems*, pp. 1-21, New Orleans. doi:<https://doi.org/10.1145/3491102.3517545>, 2022.
- [18] Mendes, P. R., Vieira, E. S., Almeida de Freitas, P. V., Busson, A. J., Guedes, A. L., Salles Soares Neto, C., & Colcher, S. (2020). Shaping the Video Conferences of Tomorrow With AI, *Companion Proceedings of the 26th Brazilian Symposium on Multimedia and Web*, São Luís, Brazil. doi:10.5753/webmedia\_estendido.2020.13082, 2020.
- [19] Minute Solutions. (2020, Sep 16). Benefits of Virtual Meetings, [Online]. Available: <https://minutessolutions.com/virtual-meeting-benefits/>, Accessed on Feb 2023.
- [20] Mucha, T., & Seppälä, T. (2020). Artificial Intelligence Platforms – A New Research Agenda for Digital Platform Economy, [Online]. Available: <http://pub.etla.fi/ETLA-Working-Papers-76.pdf>, Accessed on April 2023.
- [21] Narcisi, G. (2022, Oct 25). Cisco Webex Furthers Hybrid Work With New Features; Apple, Microsoft Partnerships, [Online]. Available: <https://www.crn.com/news/networking/cisco-webex-furthers-hybrid-work-with-new-features-apple-microsoft-partnerships?itc=refresh>, Accessed on Feb 2023.
- [22] Ojo, S. (2022, June 18). Zoom vs. Microsoft Teams vs. Google Meet: Which Top Videoconferencing App Is Best? [Online]. Available: <https://www.getdroidtips.com/zoom-microsoft-teams-google-meet/>, Accessed on Jul 2022.
- [23] Owl Labs. (2020). State of Remote Work 2020, [Online]. Available: <https://resources.owllabs.com/state-of-remote-work/2020>, Accessed on May 2023.
- [24] Pot, J. (2022, May 11). The best video conferencing software for teams in 2022, [Online]. Available: <https://zapier.com/blog/best-video-conferencing-apps/>, Accessed on July 2022.
- [25] Precedence Research. (2022, June). Video Conferencing Market - Global Industry Analysis, Size, Share, Growth, Trends, Regional Outlook, and Forecast 2022-2030, [Online]. Available: <https://www.precedenceresearch.com/video-conferencing-market>, Accessed on Feb 2023.
- [26] Reed, M., Cappel, T., & Raay, P. V. (2022, May 2). What is Video Conferencing Interoperability?, [Online]. Available: <https://www.wwt.com/article/what-is-video-conferencing-interoperability>, Accessed on Feb 2023.
- [27] Rowen, C. (2021, June 24). The latest Webex AI features empowering the future of work, [Online]. Available: <https://blog.webex.com/hybrid-work/the-latest-webex-ai-features-empowering-the-future-of-work/>, Accessed on Feb 2023.
- [28] Sadler, M. (2021, Jul 1). 84 Current Video Conferencing Statistics for the 2021 Market. (TrustRadius), [Online]. Available: <https://www.trustradius.com/vendor-blog/web-conferencing-statistics-trends>, Accessed on May 2023.
- [29] Sava, J. A. (2022, Nov 22). Work from home & remote work - Statistics & Facts. (Statista.com), [Online]. Available: <https://www.statista.com/topics/6565/work-from-home-and-remote-work/#topicOverview>, Accessed on Feb 2023.
- [30] Sava, J. A. (2023, February 6). Video meeting challenges experienced when working remotely worldwide in 2021, by category, [Online]. Available: <https://www.statista.com/statistics/1255656/challenges-experienced-online-video-meetings-global/>, Accessed on Feb 2023.

- [31] SkoolBeep. (2023). Zoom Vs Google Meet Vs Microsoft - Which is the best option for School?, [Online]. Available: <https://www.skoolbeep.com/blog/zoom-google-meet-microsoftteams-which-is-the-best-option-for-school/>, Accessed on May 2023.
- [32] Smart Systems. (2022, Nov 9). 33 Fascinating Video Conferencing Statistics, [Online]. Available: <https://iesmartsystems.com/video-conferencing-statistics/>, Accessed on Feb 2023.
- [33] Suduc, A. M., Bizoi, M., & Filip, F. G. (2009). Exploring Multimedia Web Conferencing, *Informatica Economica*, 13(3), 5-17, 2009.
- [34] Suduc, A.-M., & Bizoi, M. (2022). AI shapes the future of web conferencing platforms, *Procedia Computer Science*, 214, 288-294, <https://doi.org/10.1016/j.procs.2022.11.177>, 2022.
- [35] Sydow, L. (2020, March 30). Video Conferencing Apps Surge from Coronavirus Impact, [Online]. <https://www.data.ai/en/insights/market-data/video-conferencing-apps-surge-coronavirus/>, Accessed on Jul 2022.
- [36] The Economist. (2023, April 28). Yuval Noah Harari argues that AI has hacked the operating system of human civilization, [Online]. Available on The Economist: <https://www.economist.com/by-invitation/2023/04/28/yuval-noah-harari-argues-that-ai-has-hacked-the-operating-system-of-human-civilisation>, Accessed on May 2023.
- [37] Vailshery, L. S. (2022, Oct 12). Global market share of videoconferencing software 2022, by program, [Online]. Available: <https://www.statista.com/statistics/1331323/videoconferencing-market-share/>, Accessed on Feb 2023.
- [38] Vailshery, L. S. (2022, August 1). Zoom Video Communications, Inc. - Statistics & Facts, [Online]. Available: <https://www.statista.com/topics/8249/zoom-video-communications-inc/#topicOverview>, Accessed on Feb 2023.
- [39] Webex by Cisco. (2022). Join any meeting on Webex Devices, [Online]. Available: [https://www.webex.com/content/dam/wbx/us/ebook/join-any-meeting-on-webex-devices\\_cm-4462.pdf](https://www.webex.com/content/dam/wbx/us/ebook/join-any-meeting-on-webex-devices_cm-4462.pdf), Accessed on Feb 2023.



Copyright ©2023 by the authors. Licensee Agora University, Oradea, Romania.

This is an open access article distributed under the terms and conditions of the Creative Commons Attribution-NonCommercial 4.0 International License.

Journal's webpage: <http://univagora.ro/jour/index.php/ijccc/>



This journal is a member of, and subscribes to the principles of, the Committee on Publication Ethics (COPE).

<https://publicationethics.org/members/international-journal-computers-communications-and-control>

*Cite this paper as:*

Suduc, A.M; Bizoi, M.; Filip, F.G (2023). Status, Challenges and Trends in Videoconferencing Platforms, *International Journal of Computers Communications & Control*, 18(3), 5465, 2023.

<https://doi.org/10.15837/ijccc.2023.3.5465>