"Holoportation takes VR/AR to another level, combining both modalities to produce a platform offering a dynamic, three-dimensional (3-D) hologram presence. It is considered to be an end-to-end system of high-quality, real-time reconstructions of space, surroundings, and people, with the additional ability to transmit those recreations to remote users, permitting immediate, 3-D visual, auditory, and emotional interaction between remote settings."

Holoportation

The Disruptive Technology that Will Change the Practice of Conflict Analysis and Resolution

By Anton Shufutinsky, James Sibel, Patrick Murray-Hayden, Dmitri Shufutinsky, and Ryan Cox

As we approach the third decade of the twenty-first century, the advancements and increased use of emerging technologies are poised to alter the relationships between business, governments, and society. Conceptually, and to some extent in practice, emerging technologies provoke synergistic relationships across each of these mediums. Communication gaps often result in increased conflict. The purpose of this article is to explore how an emerging technology, holoportation, may be used in mediation and applied conflict analysis and resolution, and the technology's potential impact on the field. We posit that this technology will change the way that organizations and consultants negotiate conflict. Finally, we provide additional context related to the operational, ethical, and cultural implications of applying this technology in practice.

Regarding Conflict

Anytime humans interact, the potential for conflict exists, arising when incompatible goals develop between different parties on international, national, community, organizational, and personal levels. These conflicts can be destructive to the individuals, groups, or populations involved (Byrne & Nadan, 2011; Ramsay, 2001; Wilmot & Hocker, 2011). Smith and Berg (1987) consider conflict to be a paradox because it can be both harmful and helpful to human group dynamics. Without conflict, there can be limited progress (Jehn, 1995; Smith & Berg, 1987), mainly because conflict allows individuals to address important issues, release built up tensions, and produce novel or creative ideas (Jehn, 1995; Smith & Berg, 1987). Katz & Miller (2014) posit that effective management of conflict is a key contributing factor to the emergence of stronger teams and organizations. They emphasize that it is important for conflicting parties to lean into discomfort if they want to come to resolution and agreement. For that to happen, conflicts needs to be addressed by individuals, often with the help of organizational development (OD) professionals, conflict resolution and negotiation specialists, or attorneys, among others. To effectively manage intra- and inter-group conflict, these professionals employ a variety of conflict analysis and resolution (CAR) models and intervention tools (Fisher, 2007; Hare, 2002; Byrne & Senehi, 2007; Wilmot & Hocker, 2011), and the addition of technological advancements are key to the future of CAR effectiveness.

Conflict Analysis and Resolution in the Age of Emerging Technology

There are numerous frameworks, models, and tools available to practitioners to aid in effective CAR. However, in an age of continuously emerging advanced technology, it is to be expected that technological instruments will be able to supplement existing methods for improved CAR intervention.

Moore's Law predicted that technological power would double yearly for the near future, and that prediction has been exceeded due to the near-term transition into a long-term state of continuous advancement (Brynjolfsson & McAfee,

2014) on a steadily increasing timeline. Just as technology has been credited with significantly changing the world of business through the way organizations communicate, emerging technology has not only the potential, it has the likelihood of changing the CAR world.

The intersection of emerging technology and CAR is altering the dynamics, purpose, and reach of practitioners across the globe (Fursman & Fursman, 2014). Numerous interactive media technologies have changed the way people communicate with family, friends, colleagues, and clients. Military members can call home using video conferencing while deployed overseas. Every day, executives hold meetings with team members around the world using similar video technologies (Block, 2014). High-speed Internet, cloud computing, and the invention of media platforms such as Skype™, Zoom, Adobe Connect™, GoToMeeting™, and WebEx™, among others, allow international corporate teams to collaborate effectively (Cady, Shoup, & Hennig, 2014).

Most video conferencing technologies such as Skype™, Adobe Connect™, and others have been around for several years and have been used widely by individuals and organizations. One clear weakness of these technologies when used to facilitate CAR is that they lack dynamism due to their two-dimensional (2-D) nature. This limitation is significant as it allows those involved in conflict to mask true emotions more easily and does not permit truly dynamic interaction. A method called holoportation is the disruptor that changes this. Holoportation uses a combination of virtual and augmented reality (VR/AR) technologies to create a single technology that will disrupt the field and change the practice of CAR.

On Holoportation

A few years ago, gamers around the world were captivated with interactive video gaming experiences through the Nintendo Wii™, Microsoft XBOX Kinect™, and the Sony Playstation®. These systems allowed users to play against each other in real time, and to interact physically with the game. Shortly after, at California's 2012 Coachella music festival, the music world was stunned when world renowned rappers Dr. Dre and Snoop Dogg decided to bring out a holoform of Tupac Shakur, a deceased artist, to perform with them on stage in a pre-recorded hologram which was staged to appear live and interactive.

Virtual and augmented reality technologies are being used and studied for use in medicine, education, psychological treatment, rehabilitation, and tourism (Abdelfatah, 2016; Gibson & Sodemon, 2014; Chicchi-Giglioli, Pallavicini, Pedroli, & Riva, 2015; Jenny, 2017; Khor, Baker, Amin, Chan, Patel, & Wong, 2016; Kim, Kim, & Kim, 2017; Moro, Stromerga, Raikos, & Stirling, 2017). The advancement of VR/AR devices, including head-mounted displays and AR glasses (Kim, Kim, & Kim, 2017), has increased the way communications can be used. Because VR/AR platforms involve the use of computer hardware, software, capture, display, sensor, and tracking devices for the effective collection and dissemination of the aggregated output (Kim, Kim, & Kim, 2017), the technology affords participants the ability to insert virtual content into real world content, thus permitting them to run simultaneously in real-time and enhance participants' perception of reality (Chicchi-Giglioli et al., 2015). This is why these devices have been used successfully for inter-group participation, including multi-participant battlefield exercises involving multiple defense agencies. However, one of the most promising applications of these technologies is in advancing telepresence, or the ability of a participant to appear present at a remote location. When combined, VR/AR, termed mixed reality, allow scenarios that are nearing complete telepresence through what is called holoportation (Orlosky, Kiyokawa, & Takemura, 2017).

Holoportation takes VR/AR to another level, combining both modalities to produce a platform offering a dynamic, three-dimensional (3-D) hologram presence. It is considered to be an end-to-end system of high-quality, real-time reconstructions of space, surroundings, and people, with the additional ability to transmit those recreations to remote users, permitting immediate, 3-D visual, auditory, and emotional interaction between remote settings (Orts-Escolano, Rhemann, Fanello, Chang, Kowdle, Degtyarev, & Tankovich, 2016).

The way this technology works is neither a simple nor extremely complex system. A series of specially outfitted cameras are set up in the space to capture the participant and surroundings three-dimensionally. The cameras capture the data and software fuses the captured data together to create a temporally consistent model. The cameras are outfitted with Hololens™ tracking technology that allows them to take the 3-D models and composite them in real-time into the real world. The reconstructions are textured, and the complete data is then compressed and transmitted to the other side where the user, wearing a Hololens™ and receiving the transmission, can see the remote participant live, in his or her space, as though they are co-present (Orts-Escolano et al., 2016).

This mixed reality and digital transformation allows people to teleport from one space to another, in real-time. With both sides wearing Hololens™ displays, they can see each other in 3-D and communicate in co-presence, even maneuvering through the space of the other side (Orts-Escolano et al., 2016). This technology affords people at a distance to have the experience of being present in the same time and space, so they can connect with clients, conflict mediators, or negotiators from the next room, the adjacent building, the next street over, or from thousands of miles away.

Benefits of Holoportation Technology for Conflict Resolution

To resolve conflicts that exist between individuals, communities, or nations, significant analysis of the conflict causation is required. One of the most significant challenges faced by OD practitioners when working on CAR is the impact of globalization. Although ethno-political and international conflicts still exist, the elements of these conflicts have changed. The front lines of conflict frequently exist on the information front, with competitors waging a war of propaganda and disinformation. From an organizational perspective, we are

operating in a constantly changing world. Organizations are being forced to engage globally. Whether that means organizations have facilities and employees around the world, or they do business in the global marketplace, they are increasingly thinking and acting with a global mindset.

Additionally, with technology at the forefront, business is increasingly conducted more rapidly. Organizations are looking for rapid and agile task completion in order to adapt to ever-changing markets. As a result, when conflict occurs, it can frequently occur between or within organizations operating in different parts of the world. The speed at which organizations resolve problems is critical for organizational success. In part, this is why technology plays such a key role in CAR.

The benefit of telepresence is the ability to interact with remotely located participants in a more meaningful way than was previously possible. To date, holoportation has made the greatest stride towards complete telepresence - including mimicry of face-to-face interaction (Orts-Escolano et al., 2016). Unlike some of the other commonly used platforms, the use of holoportation provides real-time presence with three-dimensional capability, in which interaction can include not just a flat representation, but a reconstruction of the physical setting (i.e. the room, the furniture in the room, and the entire head-to-toe person), thereby allowing the transference of non-verbal communication, including hand gestures, body positioning, formal attire, and emotional responses (Orts-Escolano et al., 2016). This can also include methods of communication and collaboration, including the ability to present or refer to physical objects. Thus, the technology affords participants the ability to interpret verbal and non-verbal cues. Holoportation can also be combined with other technologically advanced systems, such as gesture and sentiment analysis programs, to aid in the interpretation of interactions by CAR professionals.

The research shows that individuals who communicate using holoportation experience feelings of spatial and social co-presence, which is often lost on solely 2-D platforms. Co-presence makes interaction more seamless and authentic, partially due to participants feeling like they can interact in the same physical space, and the perception that they are collectively modifying their mutual reality (Orts-Escolano et al., 2016). Holoportation affords a more natural and complete feel of interaction than video-conferencing alone, mainly because of a shared spatial frame of reference (Orts-Escolano et al., 2016).

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Risk Reduction Due to Non-Physical Interaction

Another potential benefit of using holoportation is the ability to have protagonists together in a room yet separated. The safe proximity holoportation provides diffuses conflict that may potentially become physical. Holoportation potentially affords the ability for individuals to be communicating in the same room as if they are physically there, while in reality they are separated by walls, buildings, or oceans. This dynamic allows those who earn their living resolving conflicts to be physically quasi-present, or holopresent, with those involved in the conflict when analyzing and mediating a resolution.

The Benefit of Improved Display During Negotiation

One more benefit of holoportation is the ability of the presenter or practitioner to display more during remote negotiation meetings. Graphic facilitation has proven to be an effective tool to facilitate meetings in person or remotely. It has been shown to increase participant engagement and collaborative bandwidth. However, graphic facilitation has been shown to have better bandwidth in face-to-face meetings as opposed to virtual meetings. It is often expressed through large graphic representations of what the group, or the conflict facilitator, is attempting to accomplish. In corporate practice, videoconferencing has been used to display some graphic facilitation through the use of PowerPoint slides and photographs via 2-D platforms (Cady, Shoup, & Hennig, 2015; Gibson & Sodeman, 2014). Nevertheless, it may not be as well suited to virtual meetings due to factors such as screen size. Also, it may not be possible to capture all participants, including their communication with one another. Holoportation, with a 3-D, dynamic, and multidirectional visual, can potentially provide the 360-degree view of the graphics as well as the graphic facilitator and the participants in various settings.

The Benefit of Cross-Generational Accommodations

One of the major challenges often discussed in the literature, relating to our technological age, involves the intersection of technology and communication. Many would argue that technology has become the Achilles heel of the millennial generation, as so much of the generation's communication uses technology at the perceived expense of developing face-to-face communication skills (Gibson & Sodeman, 2014). An argument has been made that the new tech generation needs to improve their soft skills related to business, as performance is often contingent on an ability to communicate effectively and articulate

ideas (Gibson & Sodeman, 2014). These soft skills-based interactions are potentially best accomplished through in-person communication (Drolet & Morris, 2000).

Similarly, conflict is not usually resolved through the use of some of the means of distance communication commonly used by younger generations, including text messages and e-mails (Hershatter & Epstein, 2010; Lenhart, Purcell, Smith, & Zickuhr, 2010; Meister & Willyerd, 2010) and may instead often become exacerbated by these communication modalities as a result of misunderstanding of symbols, capitalization, emoticons, and use of language (Byron, 2008; Byron & Baldridge, 2005; 2007; Luor, Wu, Lu, & Tao, 2010). This can especially become an issue in international or intercultural communication. However, in-person, face-to-face communication cannot always be easily achieved in these international scenarios. Holoportation technology, however, can provide the next best thing—a platform for dynamic, three-dimensional, verbal, and non-verbal interaction between individuals, regardless of geographic locations, in a face-to-face format. So, while holoportation is high-tech and particularly well-suited for the remote workforce of today, it may begin to help reverse the communication problems that have been exacerbated by existing communication technologies and methods.

The Benefits of Recording and Replaying CAR Interactions

Finally, one of the distinguishing attributes of holoportation's over live face-to-face meetings is the ability to have the events automatically recorded from multiple perspectives and directions. Holoportation includes the functional capability of 3-D replay and review, which can be used for scenario observation and post-event analysis. Though the main purpose of holoportation is to provide live, real-time 3-D capture, the interactions can also be recorded in their co-present state, providing the capability for the participants to practically walk into a living memory (Orts-Escolano et al., 2016). By using the Hololens™, the participants can view the recording in 3-D, seeing the entire interaction from different angles or perspectives, and viewing it through a different pair of eyes. This also affords third parties that were not participants the ability to view the interaction. Furthermore, because they are recorded interactions, the 3-D content can be miniaturized and viewed through the Hololens™ in a smaller scale version, allowing the user to oversee the scenario from the comfort of his or her desk or boardroom table in a more convenient manner (Orts-Escolano et al., 2016).

Additionally, the interaction can be replayed by a negotiator or mediator for the participants for direct feedback, so that they have a specific reference or visual cue to help them understand their roles in the conflict. It is through this retrospective revision that the participants can more easily observe how their conduct or behaviors affected the interaction and the conflict. Plus, these recordings could be used as evidence in court or in discovery, if necessary.

Another potential benefit is the use of the recorded content in combination with other analytical technologies, including gesture analysis, facial recognition, or sentiment analysis software to help facilitate further examination of an interaction. Facial Recognition Technology (FRT) uses cameras to capture specific dimensions of subjects' face-orientations, mapping thousands of unique components of the human face and allowing analysis of facial expressions for sentiment (Gates, 2011; Nawaz, Nishad, & Gomes, 2014; Voth, 2003).

One of the potential benefits of a technology such as FRT with sentiment analysis capability is that software can capture and analyze facial expressions during conflict negotiation and mediation interactions. When a conflict exists, some of the common methods used by mediation professionals during interviews and negotiations includes studying facial expressions to understand intentions, desires, and willingness of stakeholders to participate or resolve the conflict (Morris & Keltner, 2000; Rozin & Cohen, 2003; Van Kleef & Cote, 2007). The FRT potentially can aid the conflict resolution specialist with this, especially when a conflict resolution effort is distributed between numerous sessions, giving the expert an option to review and analyze recorded interactions. Furthermore, the conflict resolution professional can also use the recordings and the sentiment analysis to display and discuss expressions with participating parties, particularly if there is a relationship conflict with the goal of identifying and resolving problems.

Disadvantages and Concerns Surrounding Holoportation Technology

The advantages of these technologies, as described in the preceding sections, are plentiful and exciting, and it is easy to imagine the ease with which many of our tasks and communications may become when we adopt the described innovations. However, the introduction of such technology does not come without some disadvantages and ethical concerns.

Ethical and Cultural Issues Surrounding Holoportation Technology

As with many technologies, there exist ethical concerns surrounding holoportation as a replacement for face-to-face interaction. First is the interaction itself. Although humans have communicated remotely through mail, radio, telephone, video, and E-mail communications, holoportation extends the possibility of alternate work locations and potentially reduces the need for a great deal of travel and for conflict resolution. There is a concern, however, that the humanity that comes with face-to-face human interaction may be lost, particularly because there is an incomplete sensory connection.

Another ethical concern that exists with this emerging technology is employment. The potential decrease in the need to travel has the potential to directly and indirectly affect numerous industries, including transportation and those industries that support travel, such as hotels, restaurants, airport security, clothing, entertainment, and the energy industry. Although it can be argued positively that environmental sustainability can be improved as a result, a decrease in demand would likely result in a global decrease in employment, potentially affecting the livelihoods of many people.

Furthermore, over extended periods of time, skills would be lost or limited that would be difficult or time-consuming to recover if ever a disaster would render technology unusable.

Further ethical questions involve access and education. Certainly, advancing technologies make work and life easier for millions of people around the world. Nevertheless, the world is a disparate place, and billions of people around the world do not have the level of access to technology, or the access to training and education for the use of these technologies. This is critical in a global world, and higher expense, installation and operational needs, and technical skill requirements can put certain groups at great disadvantages, at least in the near-term. Although we can expect to see the continued spread of the technology and increased bandwidth across the globe, this is certainly not universal right now. Thus, any expectation that developing nations have the same access to emerging technology and related capacity is a flawed at best. It is not hard to imagine that any loss of connectivity while using holoportation could potentially increase conflict rather than reduce it.

Security and privacy pose a definite threat as technologies such as holoportation and facial recognition begin to become common. These technologies are very beneficial and useful, as are many that have come before them. Nevertheless, there is a great deal of unease in the public today about the ability for agencies and other entities to track, record, and investigate our personal preferences. Corporations and internet providers benefit financially from providing our information or from funneling potential interests to us. Law enforcement, and to some degree social media businesses, have proven capable of tracking and listening in on phone conversations, or looking at phone records. Hackers can steal data and identities that create serious legal and financial problems for many individuals worldwide on a daily basis. There are privacy concerns with recording holoportation interactions, and perhaps the ability of hackers or other nefarious entities to steal and use people's images in combination with other data in unintended ways. And for corporations and governments, these concerns may extend to cyber-security over trade secrets.

Furthermore, as the world becomes more globalized, cultural contingencies continue to factor into conflict causation. Despite increased global connectivity and access to technology, there is a need for individuals, communities, and nations to embrace cross-cultural understanding. The need to embrace diversity has intensified with the emergence of technologies that ostensibly connect us across the world's many historical borders. Hofstede's (1984; 1984) model of cultural dimensions still applies. Even as we can interact virtually in real-time and use 3-D technologies to connect, cultural differences still exist, notably the factors of power-distance, uncertainty avoidance, individualism, masculinity, long-term orientation, and indulgence versus restraint (Hofstede, 1984; Hofstede & Bond, 1984). The cultural issues that exist today when communicating face-to-face would certainly exist should holoportation replace them. Holoporation could conceivably aggravate these very cultural differences. If in fact holoportation results in less travel, the opportunity to learn the nuances of other cultures will diminish. The failure of individuals to learn cultural cues as a result of their travel load being reduced may result in them being more prone to exhibit insensitive behaviors during holoportation meetings. It is this reality that speaks to the need for these technologies to be used in a deliberate and focused manner.

Additional Disadvantages of Holoportation Technology

One additional limitation of holoportation is that it is reliant on reliable connectivity, significant bandwidth, and other internet-related concerns, which can still be problematic for many companies. Internet outages and limited bandwidth can result in latency, and affect the real-time benefit of this technology, potentially making the technology frustrating for users. Many organizations still experience outages with their existing 2-D systems. Further, holoportation requires a considerable amount of equipment beyond just a computer and internet access. Likewise, these devices and their implementation requires considerably more training for users on both sides when compared to the simplicity of in-person, face-to-face interaction or the use of 2-D communication platforms. Additionally, while this technology is currently available, it is not broadly available across the globe, nor is there a broad selection of competitive brands. These troubles highlight the current limitations regarding installing and implementing holoportation systems. Bandwidth concerns may limit two-way participation, particularly for nations or areas with limited access or connectivity bandwidth, as well as the resulting limited collaborative bandwidth (Orlosky et al., 2017; Smith, 2014).

Another disadvantage of holoportation, when compared with face-to-face intervention, is the limited scope of the technology to engage all our senses. Although holoportation goes well beyond its two-dimensional counterparts, it still generally only affects visual and auditory senses, and does not include touch, smell, and taste. Even though holoportation takes the visual and interactive aspects of distance communication to a deeper level, including the five qualities of natural communication, co-location, synchronization, facial expressions, body language, and speech, it does not equal organic face-to-face communication. As previously outlined, holoportation is still limited in terms of its ability to recreate the emotions and environment in which the actual negotiation and mediation is occurring. Furthermore, in using AR, the superimposition of virtual elements may inhibit the perception of real elements in the environment (Chicchi-Giglioli et al., 2015).

Summary and Conclusion

There are many technologies used in corporate and government settings for numerous purposes, including for conflict analysis and resolution. When considering emerging technologies, it would be beneficial to implement programs that apply the use of holoportation used as a dynamic, interactive technology to support conflict

Table 1. *Comparison of Capabilities and Concerns of 2-D vs. Holoportation Systems*

Feature/Capability/Concerns	PC-Video Communication Platforms	Holoportation
Live, Real-Time Interaction	X	X
Face-to-Face Interaction	X	X
3-D Interaction		X
Spatial and Social Co-Presence		X
5 Qualities of Natural Communication		
1. Synchronization	X	X
2. Speech/Auditory Communication	X	X
3. Facial Expression	X	X
4. Body Language		X
5. Co-location		X
Full Body Visual		X
Multi-Directional Visuals		X
Full Room / Area Visual		X
Shared Spatial Frame of Reference		X
Potential for Full Graphic Facilitation		X
Record, Replay, Review Capabilities		
1. Can Record interaction	X	X
2. Can Replay and Review Interaction	X	X
3. Can Review from 360 Degree Perspective		X
4. Can Review in Full-Size		X
5. Can Miniaturize and Manipulate		X
Full View and Observation of Others' Behaviors		X
Current Generalizable Affordability	X	
Current Availability	X	X
Broad Availability and Selection	X	
Currently Simple Implementation	X	
Little to No Training Required	X	
Information Security Concerns	X	X
Requires Reliable Internet Connectivity	X	X
Requires Significant Bandwidth Increase		X
Considerable Equipment Beyond Computer		X

resolution interventions in organizations dealing with conflict involving remote participants globally. Furthermore, facial recognition technology, sentiment analysis, posture analysis, and wearable translation devices, when combined with holoportation, can be used by practitioners to make the holoportation platform even more effective and versatile.

Although there are currently some drawbacks regarding this technology, the potential use of holoportation applied to conflict analysis and resolution will bring many advantages. Accordingly, while it may not currently make sense to apply it in all conflict resolution scenarios, it is without question a powerful tool that can be used by lawyers, expert negotiators, OD professionals, and their clients when dealing with conflict, particularly from a global perspective.

Technology will continue to emerge, and it is not difficult to imagine a time when organizations have mixed reality devices embedded in eyeglasses, interactive smart clothing equipped with micro-sensors, Wi-Fi transmitters, microphones, and micro-cameras, as well as wearable translation devices, enabling direct workplace and process observation, allowing remote consulting or mediation facilitation from hundreds or thousands of miles away. It is no longer such a reach to imagine "beam me up, Scottie" being a reality, but without the necessity of molecular deconstruction of biological tissue as we might have watched in film. It begins with holoportation, an available technology that will undoubtedly, in the very near future, transform the global practice of mediation and CAR.

References

Abdelfatah, H. (2016). Cyber learning from reality through virtuality to holoportation: Status-quo and a proposed model for closing the gap in Africa. *ASRO Journal of Education, 1*(2), 28–38.

Block, P. (2014). Technology, culture, and stewardship. *Organization Development Journal, 32*(4), 9–13.

Brynjolfsson, E., & McAfee, A. (2014). *The second machine age: Work, progress, and prosperity in a time of brilliant technologies*. New York, NY: W. W. Norton & Co.

Byrne, S., & Senehi, J. (2007). Conflict analysis and resolution as a multidiscipline: A work in progress. In D. J. D Sandole, S. Byrne, I. Sandole-Starote, & J. Senehi (Eds.), *Handbook of conflict analysis and resolution*. New York, NY: Routledge/Taylor & Francis.

Byrne, S., & Nadan, A. (2011). The social cube analytical model and protracted ethnoterritorial conflicts. In T. Matyok, J. Senehi, & S. Byrne (Eds.), *Critical issues in peace and conflict studies: Theory, practice, and pedagogy*. New York, NY: Lexington Books

Byron, K. (2008). Carrying too heavy a load? The communication and miscommunication of emotion by email. *Academy of Management Review, 33*(2).

Byron, K., & Baldridge, D. C. (2005). Toward a model of nonverbal cues and emotion in email. *Academy of Management Proceedings* 2005(1), B1–B6.

Byron, K., & Baldridge, D. C. (2007). E-mail recipients' impressions of senders' likability: The interactive effect of nonverbal cues and recipients' personality. *The Journal of Business Communication (1973), 44*(2), 137–160.

Cady, S. H., Shoup, Z. D., & Hennig, T. (2015). From smoke signals to the cloud: A review and analysis of distance media for control, coordination, and collaboration. *Organization Development Journal, 33*(1), 41.

Chicchi-Giglioli, I. A., Pallavicini, F., Pedroli, E., Serino, S., & Riva, G. (2015). Augmented reality: a brand-new challenge for the assessment and treatment of psychological disorders. *Computational and mathematical methods in medicine, 2015*.

Drolet, A. L., & Morris, M. W. (2000). Rapport in conflict resolution: Accounting for how face-to-face contact fosters mutual cooperation in mixed-motive conflicts. *Journal of Experimental Social Psychology, 36*(1), 26–50.

Fisher, R.J. (2007). Interactive conflict resolution: Dialogue, conflict analysis, and problem-solving. In D.J.D Sandole, S. Byrne, I. Sandole-Starote, & J. Senehi (Eds.), *Handbook of conflict analysis and resolution*. New York, NY: Routledge/ Taylor & Francis.

Folger, J. P., Poole, M. S., & Stutman, R. K. (2016). *Working through conflict: strategies for relationships, groups, and organizations (7th Ed.)*. New York, NY: Routledge.

Fursman, R., & Fursman, I. (2014). Winning the peace in Ukraine by combining od practice with technology. *Organization Development Journal, 32*(4), 53–62.

Gates, K. A. (2011). *Our biometric future: Facial recognition technology and the culture of surveillance*. New York, NY: NYU Press.

Gibson, L. A., & Sodeman, W. A. (2014). Millennials' and technology: Addressing the communication gap in education and practice. *Organization Development Journal, 32*(4), 63–75.

Hare, S.M. (2002). Toward a multidimensional model of social interaction as related to conflict resolution theory. *ILSA Journal of International and Comparative Law, 8*, 803–823.

Hasler, B. S., Hirschberger, G., Shani-Sherman, T., & Friedman, D. A. (2014). Virtual peacemakers: Mimicry increases empathy in simulated contact with virtual outgroup members. *Cyberpsychology, Behavior, and Social Networking, 17*(12), 766–771.

Hershatter, A., & Epstein, M. (2010). Millennials and the world of work: An organization and management perspective. *Journal of Business and Psychology, 25*(2), 211–223.

Horvath, H. L. (2015). The intersection of technology and od consulting in professional sports. *Organization Development Journal, 33*(1).

Hofstede, G. (1984). Cultural dimensions in management and planning. *Asia Pacific Journal of Management, 1*(2), 81–99.

Hofstede, G., & Bond, M. H. (1984). Hofstede's culture dimensions: An independent validation Cusing Rokeach's value survey. *Journal of Cross-cultural Psychology, 15*(4), 417–433.

Jehn, K. A. (1995). A multimethod examination of the benefits and detriments of intragroup conflict. *Administrative Science Quarterly*, 256–282.

Jenny, S. (2017). *Enhancing tourism with augmented and virtual reality*. HAMK: Visamaki, Finland.

Kankanhalli, A., Tan, B. C., & Wei, K. K. (2006). Conflict and performance in global virtual teams. *Journal of Management Information Systems, 23*(3), 237–274.

Kaufman, B. M. (2017). Will Apple's FaceID affect your rights? ACLU Center for Democracy. [*https://www.aclu.org/blog/privacy-technology/surveillance-technologies/will-apples-faceid-affect-your-rights*]

Khor, W. S., Baker, B., Amin, K., Chan, A., Patel, K., & Wong, J. (2016). Augmented and virtual reality in surgery—the digital surgical environment: applications, limitations, and legal pitfalls. *Annals of Translational Medicine, 4*(23).

Kim, Y., Kim, H., & Kim, Y. O. (2017). Virtual reality and augmented reality in plastic surgery: A review. *Archives of Plastic Surgery, 44*(3), 179–187.

Lenhart, A., Purcell, K., Smith, A., & Zickuhr, K. (2010). Social media & mobile internet use among teens and young adults. Millennials. *Pew Internet & American Life Project*.

Luor, T. T., Wu, L. L., Lu, H. P., & Tao, Y. H. (2010). The effect of emoticons in simplex and complex task-oriented communication: An empirical study of instant messaging. *Computers in Human Behavior, 26*(5), 889–895.

Matsumoto, D. (1990). Cultural similarities and differences in display rules. San Francisco State University. *Motivation and Emotion, 14*(3).

Meister, J. C., & Willyerd, K. (2010). Mentoring millennials. *Harvard Business Review, 88*(5), 68–72.

Moro, C., Štromberga, Z., Raikos, A., & Stirling, A. (2017). The effectiveness of virtual and augmented reality in health sciences and medical anatomy. *Anatomical Sciences Education*.

Morris, M. W., & Keltner, D. (2000). How emotions work: The social functions of emotional expression in negotiations. *Research in Organizational Behavior, 22*, 1–50.

Nawaz, Nishad, M. & Gomes, A. M. (2014). Automation of the HR functions enhance the professional efficiency of the HR professionals – A Review. *IJMIE*, Volume 4 Issue 2 ISSN: 2249-0558

Orlosky, J., Kiyokawa, K., & Takemura, H. (2017). Virtual and augmented reality on the 5G highway. *Journal of Information Processing, 25*, 133–141.

Orts-Escolano, S., Rhemann, C., Fanello, S., Chang, W., Kowdle, A., Degtyarev, Y., & Tankovich, V., et al. (2016, October). Holoportation: Virtual 3d teleportation in real-time. *Proceedings of the 29th Annual Symposium on User Interface Software and Technology* (pp. 741–754). ACM.

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Ramsay, M.A.E. (2001). Conflict in the health care workplace. *BUMC Proceeding, 14,* 138–139.

Rozin, P., & Cohen, A. B. (2003). High frequency of facial expressions corresponding to confusion, concentration, and worry in an analysis of naturally occurring facial expressions of Americans. *Emotion, 3*(1), 68.

Singh, A., Patil, D., Reddy, G. M., & Omkar, S.N. (2017). Disguised face identification (DFI) with facial keypoints using spatial fusion convolutional network. IEEE International Conference.

Smith, K. K. & Berg, D. N. (1987). *Paradoxes of group life: Understanding conflict, paralysis, and movement in group dynamics.* San Francisco, CA: Jossey-Bass

Spalding, J., & Grandstaff, J. (2015). Large group dialogic conference calls: A case study in using phone conferencing technology for whole system strategic planning. *Organization Development Journal, 33*(1), 9–26.

Van Kleef, G. A., & Côté, S. (2007). Expressing anger in conflict: When it helps and when it hurts. *Journal of Applied Psychology, 92*(6), 1557.

Voth, D. (2003). Face recognition technology. *IEEE Intelligent Systems, 18*(3), 4–7.

Wilmot, W.W. & Hocker, J.L. (2011). *Interpersonal Conflict* (8th ed.). New York, NY: McGraw Hill.