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Organizational Communication at the Era of Virtual Reality and Society 5.0

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Abstract. This research aims to identify how the implementation of organizational communication at the era of Society 5.0 through the technology of Virtual Reality as the most relevant instrument especially in the current COVID-19 pandemic. This research conducted with qualitative methods with literature study. The result of this research take form as the conclusion of what and how the implementation of organizational communication which happens in the era of Society 5.0 via Virtual Reality which certainly be different than conventional interpersonal communication. The research concludes that Society 5.0 is the next milestone in the ever-evolving life phase which situate humanity as the center of the process. Through Society 5.0 and Virtual Reality making it possible as a new plane of interaction with tools like Customizable 3D Avatar, Gesture, and 3D Room Chat. Contradictory to the usual online video calling where we only able to see the video frame of the other party.

Keywords: Organizational Communication, Virtual Reality, Society 5.0.

1. Introduction

Society 5.0 which originated from Japan [1] acts as a stepping stone and development of the Industrial Revolution 4.0 which places humans at the center of the process allows further innovations that have the potential to minimize various barriers and limitations to communication that previously only done by video calling by introducing Virtual Reality. Virtual Reality allows additional input such as gestures to add a sense of spontaneity and additional feedback in communication. Users will see the other parties with more immersive representation than just a video frame. The use of 3D Chat Rooms and 3D Customized Avatars also allows personalization and how users see and represent themselves. Virtual Reality is the main instrument used in the Metaverse era by Big Tech companies like Meta and Facebook. Enthusiasm about the Metaverse is

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evidenced by the many product concepts and innovations introduced at CES 2022 (time.com)

Productivity trend and interaction among humans in this era proven not to be dormant although stumbled with COVID-19 Pandemic. In a survey conducted by wfhresearch.com at March 2021, showed that 6 out of 10 workers actually feels even more productive and accomplish many substantial task even though the meeting and communication done via telecommunication (Work from Home) . This fortified by the policy of Big Tech Company (FAANG) such as Meta and Microsoft that applied permanent stay-at-home work system and communication regardless of the COVID-19 Pandemic.

Humans are a social creatures who tend to live in a society through arranging and organizing their range of activities in order to achieve a distinct objective. Communication is a integral and irreplaceable aspect of humanity as humans cannot not communicate [2]. But physical and mental limitation prevent humanity to actualize this objection without cooperation and collaboration. This cooperation is the sole fundamental for them to coexist in an organization.

Organization is a relationship between one humans and another in a single group in order to accomplish a collective task. According to other definition: Organization isa social unit or a group who in a pure consciousness construcing and reconstructing in order to achieve a similar accomplishment [3]

Communication is an inseparable process in all of humanity especially Organizational Communication either in a community or a corporate environment. Organizational Communication viewed as a process to gather, process, stored, and spreading information in between the units of organization which make it possible for a organization communication system to function effectively. [4] There are several kinds of organizational communication: Verbal Communication and Written Communication, Formal & Informal Communication, Directed Communication, and Internal and External Communication. Certainly these are crucial instrument for an organization to exist.

Communication adaptations carried out during the COVID-19 Pandemic era following Society 5.0 are online video calling using applications such as Zoom Meeting, Google Meet, or Microsoft Teams [5] which are equipped with tools such as meeting record, live streaming, reactions, markup/annotate, and screen sharing. However, this method cannot replicate the natural essence of how communication between humans occurs using various gestures, semiotics, and spontaneous feedback. [6]

The purpose of this study is to determine the effectiveness and implementation of Organizational Communication carried out in the Virtual Reality environment at Society 5.0 to minimize communication barriers that occur in conventional ways such as online video calling both during the COVID-19 pandemic or in the future.

2. Method

This research uses qualitative method. Qualitative research method is basically a scientific way to get data with a specific purpose and usefulness [7] Literature study used as a means to describes the effectiveness and implementation of Organizational Communication carried out in a Virtual Reality environment in Society 5.0.

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Totals of 22 Journals from various sources and university are thoroughly referenced and studied regarding vast topics of Virtual Reality and Society 5.0 to ensure the depth and accuracy of this research.

3. Result And Discussion

Society 5.0

Society 5.0 is the next milestone of this ever-evolving human's way of life that is crafted by Japan government in the document of 5th Science and Technology Basic Plans [8] What's distinct about Society 5.0 contrary to the previous iteration is how the principle put the humanity at the center of the process. The purpose of this concept is to manifest a high-quality society through harnessing Industrial Revolution 4.0. Essentials instrument for this principle is to fuse Cyber Space and Reality Space to create a brand new plane that can acts as a fundamental solution for every problems [8] This enables humanity to live in conjunction with technology to provide services and valuable solution for significant sustainable life.

Many misunderstood the Society 5.0 as a next edition of Industrial Revolution 4.0 but factually both of it paramountly should be carried out in tandem by humanity to solve almost every problem [9] In this era, all data about our daily behaviour able to be used as a basis for creating services or products that meet individual needs in a sustainable manner [10]. The high establishment of digital technology has made this technology a crucial part of human daily life. The meaning of the concept of Society 5.0 explains that human beings must use various technologies in order to have a good quality of life.

The main goal of designing the Society 5.0 concept is to build a human-centered society where economic development and problem solving can be achieved, and everyone can enjoy a quality life [10] Table 1 shown to further clarify the differences between iterations of Societies.

Table 1. Kinds of Society Source: Japanese Business Federation (via CGTN)

Society	Time Period	Characteristic
Society 1.0	The Birth of Human Beings	Hunting
Society 2.0	+/- 10000 Years Ago	Agrarian
Society 3.0	End of 18th Century	Industrial
Society 4.0	Second Half of 20th Century	Information
Society 5.0	First Half of 21th Century	AI & Smart Society

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Connection between Society 5.0 and Industrial Revolution 4.0 is inseparable and have mutual objective to accelerate humanity's growth even further by taking into account the humanity aspect so it can evolve and solve various problems and create sustainable development across the entire aspect of life [11] Industrial Revolution 4.0 sets technology as an instrument to gain information, Society 5.0 emphasizes said technology and its role to be part of the humanity life itself [12]

Virtual Reality

In Indonesia, Virtual Reality is still a premium and foreign concept that is widely adapted through steep resources requirements. ALA (American Libraries Association) states that virtual reality (VR) is a computer-generated image simulation or an entire environment that can be experienced using special electronic equipment that allows users to be "present" in alternative environments such as the real world to three-dimensional virtual objects and information. (3D) with additional data such as graphics or sound. It takes form as an immersive 360 ° video that captures the entire scene where the user can look up, down and around and allows the user to interact with both physical and virtual objects. This new "reality" can create unique experiences that expand the possibilities and directly engage users. [13] Hendro revealed that Virtual Reality (VR) is an implementation of multimedia technology that has advantages in describing a situation or object where the displayed visualization can not only be seen from one point of view, but can be seen from all sides as it has 3 (three dimensions) . visually so that users can interact with an environment that is simulated by a computer [13] This surround visual and audio experience trick human's mind to be transported in a whole different worlds.

Steven from LaValle, 2019 states that Virtual Reality is an artificially created sensory stimulation utilize to induce a human into a computer-generated simulation and worlds. There are 4 (four) main keys in defining VR [14]

1. Targeted Behaviour

Users will experiencing the world and environment as meant and designed by the creators and designers. e.g. : Experiencing walking in the jungles, flying in the skies, exploring, interacting with other in-world creatures, and so on.

2. Organism

Users will able to see perspective (PoV) of other humans, animals like cats, birds, and other organisms through camera and lightning technique.

3. Artificial-created Sensory Stimulation

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Through precise engineering, programming, and visual designs the person will be able to feel physically such as flying, touching a certain surface, or in the adrenaline of being in the edge of a cliff.

4. Awareness

When experiencing a VR experience, users will have a real experience as if they were in an "other" world created by the creator. Extended exposure to VR experiences will trick human's mind, spatial, and temporal awareness so their consciousness and awareness will shift as if they're in "other" worlds designed by the creators.

The key to realize those 4 defining aspects of Virtual Reality (VR) is to ensure the effectiveness and seamless integration between all the elements. This elements are take form as interactive computer simulations that able to affect the user's senses and even overwrite one or more basic human sensory system, so that the user fused into the simulated environment [15-16] Mihelj et al. (2014) explain that there are 4 basic elements of Virtual Reality, namely:

1. Virtual Environment

Virtual Environment is an environment that is generated by a computer, in the form of an emulated actual or fantasy environment based in real places or creative visualization. This environment could be scaled as small as a home interior or as big as a continent in open world games.

2. Virtual Presence

Virtual Presence, which is a feeling of one's existence from a virtual environment. The user will reacts with virtual animated and inanimate as they would with real objects.

3. Sensory Feedback

Sensory Feedback is a integral asepcts of VR. VR systems provide real time sensory feedback via visual information. VR systems provide real-time sensory feedback to users based on their physical locations. This feedback counted in Frame per Seconds.

4. Interactivity

Interactivity has the main role of responding to actions from users so that users can interact directly in the virtual world. This interactity precision required to worked on uppermost details to ensure the longevity of user's immersive feelings so they won't "disconnect" to the virtual reality realms. To further clarify and put distinct characteristics between " Realities " , it will be shown in Table 2.

Table 2. Comparison of "Realities" Source: Personal Research

	Real Reality	Virtual Reality	Augmented Reality	Video Calling
Visual	Yes	Yes	Yes (Fusing with Reality)	Yes

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Audio	Yes	Yes	Yes	Yes
Smells	Yes	Yes (With Special Tools)	No	No
Surface	Yes	Yes (Sensory Simulation)	No	No
Movement (Spatial)	Yes	Yes (Simulated)	No	No
Customization	Yes (Not Defying Physical Nature)	Yes (Limitless)	Yes	Yes (Video Frame & Filters)

VR technologies has been widely applied in several industrial sectors such as entertainment, medicine, education, aviation, architects, military, and so on. VR proven effective for simulating aspect that is difficult or expensive to be presented in the real world, e.g. : brain surgery practice, missile simulation, high rise building 3D 360 immersive blueprints. Military harnessing VR for creating battlefield simulation so it will minimalize injuries, casualties, and resources expenses. Instead of directing soldiers to the battlefield as an exercise, VR can present a virtual war simulation. The soldiers can feel the sensation of being on the real battlefield without having to go directly to the real battlefield. [17-23]

Communication in Virtual Reality

What makes humanity difficult to adapts for Work-From-Home or Studying-At-Home session is how awkwardly they interact and communicate with each other in a video conferences app, it won't be able to replicate the naturality and seamless interaction in real world because of the sensory obstacles. This limitation proven to be possibly decreased thanks to phenomenon named telepresence. Telepresence is a occurrence when the user's mind feel as if they're shifting between worlds and able to naturally interact with any objects presented in front of them. Telepresence defined as the phenomenon of one's presence in another world through a medium [24-26] Figures 1 will systematically explain the indicators and characteristics of Telepresence.

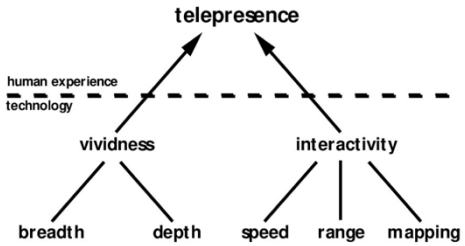

Figure 1. Telepresence Source: Moura, 2017

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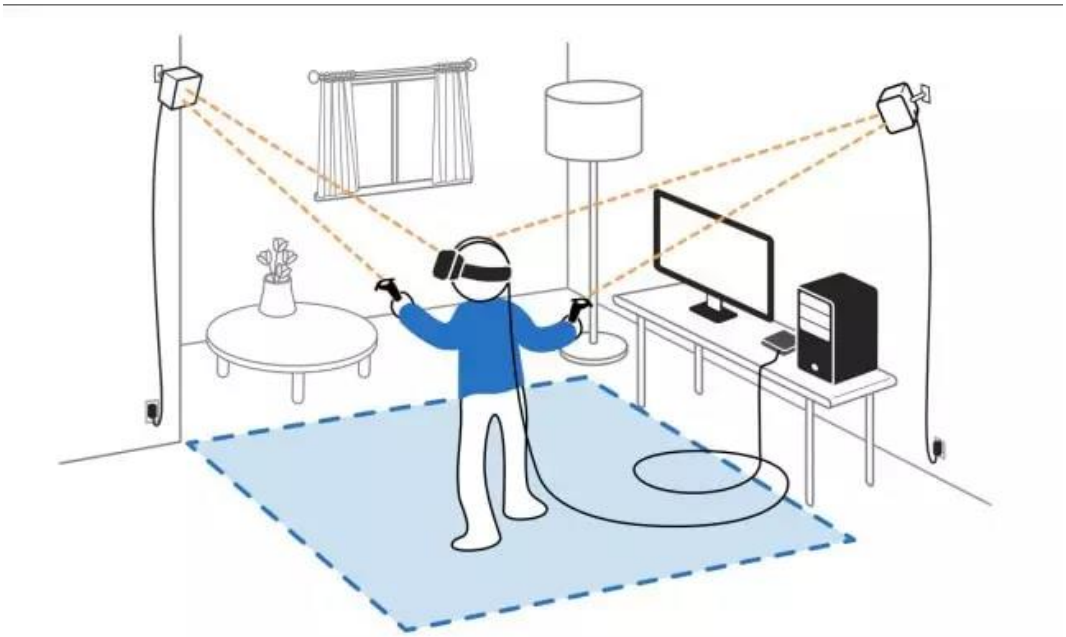
Although still deemed expensive by majority of society,VR tools and headsets are increasingly getting more affordable and widespreadly available for the masses thanks to brand like Oculus. In order to grant the user's an optimal VR experiences, users require a set of VR tools consisted of: a VR headsets, two controller with surface-sensor each for one hand, and a set of trackers to track the spatial position of the users, Figure 2 will show the basic schematics and displays of how VR works.



Figures 2. How VR works and tracks users. Source: 4experience.co

Thanks to technology advancement, many VR tools are getting more affordable and integrated one and another, for example current VR technology eliminates the need of separate camera trackers, instead they took form in Gyroscopes and other sensor embedded in the headset and hand controllers. This innovation going further with standalone features so the users won't be needing expensive Gaming PC to displays VR games or contents. This innovation and advancement is shown on Table 3.

Figures 5. VR Systems Throughout the Year. Sources: Oculus's & HTC's Website

	HTC Vive	Oculus Rift S	Oculus Go
Pictures			

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Type	Tethered (Need PC, Need Tracker)	Tethered (Need PC, Built-in Tracker)	Standalone
Launched	2016	2019	2019
Resolution	2160x1200	2560x1440	2560x1440
Price	499 USD	399 USD	199 USD

The VR hardware is not the only aspect that continuously developed throughout the years, but the software that take form in VR video entertainment and games is also getting even better, more seamless, and true-to-life proven by users getting less nauseous or having motion sickness present in earlier form of VR games and videos. This software and hardware accomplishment enable a brand new space and plane for humanity to interact within each other in an app called VRchat, screenshot of the games shown in Figures 6.

Figures 6. VRChat. Sources: GMW3

This games provide a fully customizable spaces for their users to interact, rather than only using webcam and microphone experienced in conventional video calling, users will be able to harness trackers in the headsets and controllers to be able to physically turns their head (nod and shake) or move their hands (waving, punching, grabbing, and "hugging"), even simulating a certain walking and running pattern. Users able to fully customizes their characters either be as realistically as possible or unleash inner fantasies. This additional sensory experiences greatly enhances the immersiveness of communication between one humans and another. This virtual spaces adapted by Meta (previously Facebook) as their flagship features in their Metaverse concept with Facebook Horizon World shown in Figures 7.

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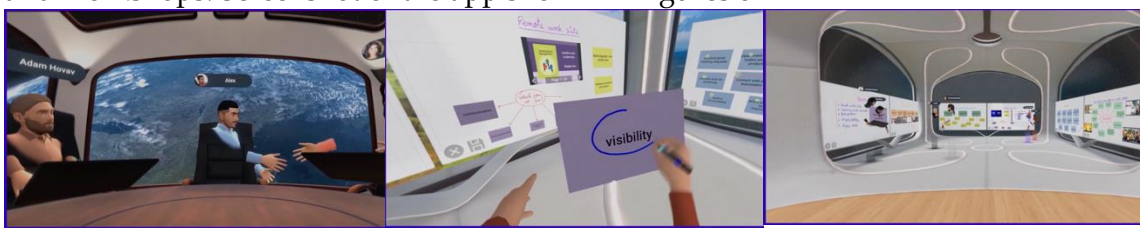
Figures 7. Facebook Horizon World Sources: blok-a

Implementation of Organizational Communication in Virtual Reality

Meanwhile Meta's Metaverse and their Facebook Horizon World served merely as a concept as per February 2022. An app named MeetinVR proved themselves capable to generating a coherent and cohesive spaces for professional purposes such as meeting and workshops. Screenshot of the app shown in Figures 8



Figures 8. MeetinVR World. Sources: MeetinVR's Website

A research conducted by scholars from University of Ljubjana explains based on Roman Jakobson's Linguistic Methods that Dressing [24] is part of non-verbal communication, our style of dressing representing who we are and how we want to be seen in the world. Limitless 3D avatar customization in the app grant additional layers of how we want to communicate ourselves and personas, more executive members of the meeting could dress more sophisticatedly than the lesser members, or how the leader

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apply a specified dress attire code for more casual and fun brainstorming meeting session. Hand gestures performed by sensors and trackers could pave way more cheerful and real expression such as clapping when the company/group accomplish a significant feat, handshaking as a means to secure a deal or decision, or raising hand for asking a question, real gestures like these provide more telepresence and true-to-life interaction rather than just a "button".

MeetinVR provide a more sophisticated space to meet, talk, discuss, and brainstorming rather freely-used VRchat for more professional needs. Users could even draw in a whiteboard and exchanging post-it notes between colleagues. More screenshots shown in Figures 9.

Figures 9 MeetinVR World. Sources: MeetinVR's Website

4. Conclusion

Technological advances in Virtual Reality paves way a brand new plane for humanity to interact with each other regardless of pandemic or not, Society 5.0 principle to put humans in the center of the process work in conjunction with Industrial Revolution 4.0 to generate ground breaking and futuristic ideas births the promising execution of VR either in hardware and software accomplishment.

This research concludes that Virtual Reality in fact is not a gimmick, instead it's a potential to be counted on for propelling a new course in humanity's civilization in terms of communicating with each other. Virtual spaces such as VRChat and MeetinVR provide a fun, new, engaging, and limitless customization spaces either for interpersonal and organizational communication to be occurred.

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