THE FUTURE OF AUDIOVISUAL STORY TELLING

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ABSTRACT

The inception of storytelling can be found right from the existence of Homo sapiens (Humans). Humans used the method of storytelling to preserve their stories, history and cultural traditions of their ancestors primarily in an oral tradition. Historically, Storytelling have been used by the tribal communities to share language, traditions, and beliefs from one generation to another. Different societies have taught key principles through storytelling for thousands of years. (Brady, 1997; MacDonald, 1998). In many ancient cultures, without a written language storytelling was the only way to convey a society's culture, values, and history. Verbal communication is one of the fundamental forms of communication, whether humans once communicated with primitive grunts. As humans are social creatures, they use different mediums to communicate which also proves as an evidence of socialism of humans. Consequently, storytelling evolved from stone scripts to the digital and now it is further transforming to the immersive medium format. Different cultures documented their stories, history and digitized it to preserve it.

Many ways of storytelling developed along with the development of human being. The technology played a vital role in establishing various new formats of storytelling. Stone scriptures, literature, narrations, audio formats, recordings, paintings, visuals and audio-visuals etc. is the normal journey of storytelling. As the visual medium emerged the core part of it became the images which further transformed into video.

Aesthetics and content of the storytelling is creatively enhanced with the help of various processes. Amongst which audio-visuals are the most important. Audio visual storytelling took its shape right from the grandmother stories and immerged as the most effective medium of storytelling in the journey of all forms of storytelling. Image processing; the set of techniques used to modify a digital image in order to improve it (in terms of quality), or to reduce its size or to get information out of it. Digital image processing is a new sector of knowledge that has quickly developed due to the emergence of new information technologies.

This research gives spotlight on the analysis of multidimensional role of audio-visuals in altering the complete way of contemporary storytelling. It deals with various aspects of audio-visual production process related to audio, video and images. The main purpose of the study is to discuss the future development in the audio-visual format of storytelling with respect to the technological aspect.

Keywords

Digital storytelling, Image processing, electronic systems, video, audio-visual production

1. Introduction

Storytelling can be described as prehistoric people exchanged information about the different types of environment, wildlife movements, or sources of food. This type of survival information was codified which was expanded by the inclusion of history, cultural mythology and tradition over the generations. The result of this was narratives which can be described as the recounting of event sequences land their meaning in various perspectives which were used by storytellers to preserve and share. Storytelling which consist of the plot, characters, indistinct and logical unfolding of events and a climax expanded to dramas, enactments and myth-based rituals. Stories help us to explain the different kind of roles of people in various events which may be seen and unseen events in the surrounding world and made them to inspire to undertake their extraordinary deeds, their journeys, or battles. Joseph Campbell found out that the re-enacting the myths as ritualistic participatory drama which generally involve narrative, music, and/or other audio sources by cultures around the world (Campbell, 1949). As the technology evolved the stories were told with the help of images.

The pictorial superiority effect. The largest system in the human brain is the visual cortex. The visual sense always dominates the human thought process and understanding. Study after study bears this out. When the words ared effectively paired with pictures and videos, it enhances attention, memory, recall, and believability. As per the study done by Pear Press people remembered only about 10 percent of the things they heard after 72 hours but the percentage increased to 65 when some pictures were added. (Medina, John. Brain Rules. Seattle: Pear Press. 2008. P. 234). This gives us the insight that when audio and visuals are combined together it creates greater impact on the human mindset which caters to the fact that storytelling becomes more effective with the inclusion of audio visuals in the narrating styles.

The immergence of computer and other audio-visual mediums into storytelling arena has blessed the society with a range of new approaches which give experiences that include direct participation by listeners, even co-creation of stories.

It also provided the ease of creation and distribution to a broad audience which resulted into engaging, compelling emotional narrative formats, interactive and immersive narration experience, multidimensional narratives, non-linear and collaborative contexts which increase the ability to create and communicate.

2. Digital Storytelling

Digital storytelling is used for interactivity, creating and sharing information and promoting immersion. As the name suggest Digital storytelling is telling the stories digitally. Basically digital storytelling is the combination of digital content/media and the art of storytelling.

It is a practice in which people use digital medium to tell, create or present audio-video stories. This puts the universal human delight of telling narration and expressing self into the hands of each person. It brings a timeless form into the digital age, to give a voice to the myriad tales of everyday life as experienced by ordinary people in their own terms. Despite its use of the latest technologies, its purpose is simple and human. John Hartley and Kelly McWilliam, 'Computational Power Meets Human Contact' in Story Circle (2009).

Digital Story telling has a spectrum of dimensions like documentaries, audio-visual films, essays, docudramas, historical/eye witness accounts, short films, memoirs, narratives, research findings/presentations, and more. Digital Storytelling is not only the use of simple digital technology, but it follows creative traditions like slide shows, audio jingles, stills photography, audio-visual filmmaking, forum theatre, digital broadcasting and in future virtual reality and altered reality.

This creates a new hybrid form – the Digital Story. It may include one of the above form or the combination of more than one forms. A dominant and expressive form of personal expression somewhere between a turbo powered slide show and the traditional short film. It provides the means of powerful and personal digital stories for everyone to be seen and heard. The most common combination of the genre is the addition of digital media like animation, audio, graphics, social media, multiplayer games, music, Web publishing, narration, video, and writing.

The digital technology has facilitated changes in the production as well as distribution of audio-visual material in the past twenty years or so. The main advantage of this technology is the reduction in the complexity and cost of production. The new forms such as camcorder drama on mainstream TV were emerged as the important source in 1990s. The more recent dramatic lowering of the cost and complexity of collaboration brought about by the internet represents an opportunity for new forms of creativity as mainstream media fragments and new opportunities appear in the cracks.

Lambert, Ashley, and Mullen started the practice of digital storytelling with creation of 2-3 mins videos which included voice narration, text, images and also music. It developed this format into multidimensional approach like Podcasting, Multimedia storytelling, transmedia storytelling etc. These approaches are not separated or isolated from each other but they gets morphed and leak into one another and gives us interesting results.

3. Images

From the above discussion it is certain that video is a core part of digital storytelling. Before looking into the video form we have to understand how video is formed. The sequencing of images in prescribed time period creates a motion in the sequence in front of the naked eye. A simple technique in physics persistence of vision. So the basic entity of video is Image. Image creates the vision and which subsequently creates linking which plays a major role in storytelling through the videos.

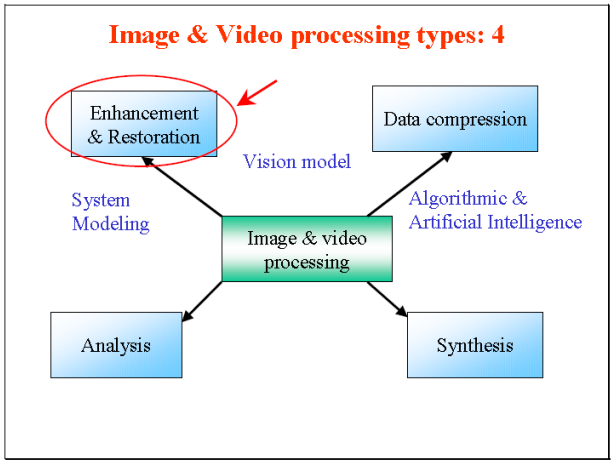
We come across various sorts of images in our daily environment which includes photographs of landscapes, images of different incidences, people, computer-generated drawings and paintings, images from medical radiology, graphically generated images, satellite images, and so on. Some of these images which includes images coming from satellites and for medicine purposes cannot be directly observed, but most of the others can be extracted automatically, stored on any system and can be sent anytime anywhere.

The images as discussed earlier in sequence creates a motion which is further converted into video. The process of video formation can be understood by segmenting video into its smaller parts. When we look at the hierarchy of partitions, we get a sequence of scenes at the highest level where each scene shows us a high-level concept of a story. Lower than this the scene may be segmented into a clear sequence of video segments which are named as shots which are the longest continuous image sequences captured from a single source say a camera. So finally, at the lowest level of the hierarchy we get images extracted from shots which are called as frames in video which shows us the basic content.

Many times, these images are processed and re-processed from some specific purposes before actual use. The processing is highly varied, as the images we come across in our environment are also varied, by their nature and properties as well as the contents they describe.

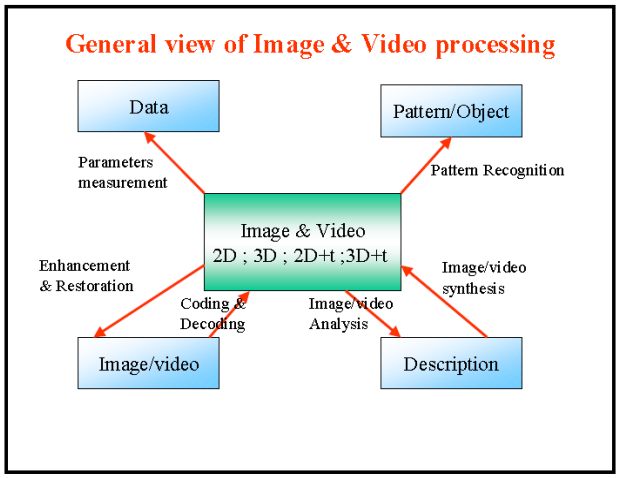
Now what exactly image processing is? It can be described as "Any alteration made in natural or captured form of that particular image is image processing." It varies from person to person and form to form. It is not always conceivable to particularly create a specific type of processing for each image. This has created a classification of image processing which do not rely on the characteristics of image but rather on the objective of processing it. Application domains for Image processing can be distinguished in four types.

1. Image enhancement and restoration
2. Analysis of image
3. Data compression with coding of images
4. Image synthesis



The image processing cannot be simply characterized in terms of its domains of application but also the nature of the results that will be put out should be taken in consideration. The inputs can vary in two types which include a description or an image. Accordingly, the output will also vary. It may be image type which can be the case with image coding for data compression, image enhancement and also the complete restoration of some quite poor-quality images. The other is data type where one makes an elementary image analysis where the interest may be the spatial dimension of the particular object in the scene, its position or its color. The next image analysis type is pattern type which is more elaborate one as it is involved with the extraction and recognition of the objects observed in the scene. The Scene description type is also a possible output for the analysis of image. It is the most advanced version as the image is completely broken up so as to recognize the object in the scene. It described the scene totally and can be interpreted. The remaining is Image synthesis which is from a description input and the only expected type for the output is an image. The image is reconstructed by the given description. It includes the objects present, their dimensions, their presence in the scene, lighting conditions, parameters like focal length, viewing angle etc of the camera while doing the filming.

All the aspects of image processing mentioned above are strongly interconnected. The characteristics of the image is also important for processing purpose.



Images are processed basically in various parts like data, pattern, video and description as seen in the above figure. For this the most important aspect is editing.

4. Multimedia

A productive context of exploring the digital storytelling is Multimedia. Using multiple media resources separately or in combination with each other depending on the purpose of storytelling and the skills of the storyteller. It provides a wide range of opportunity to tell immersive, interactive and participatory stories both in fiction and non-fiction format to general or specific audiences for entertainment and pragmatic purposes.

Some examples can be mentioned here as follows according to the combination of their mediums.

1. The combination of Text, images and Video: “Snow Fall: Avalanche at Tunnel Creek” by John Branch (Branch, 2012).
2. The graphic novel exclusively for the iPhone: “The Carrier” by Evan Young (Evan Young, 2009; http://www.carriercomicbook.com/) , It was on the time based delivery of content to the device and other information was delivered by email. Sadly, it is no longer available on it.
3. A complimented reading experience with the help of fluid navigation, accelerometer driven 3D effects and dynamic Music: Upgrade Soul (Eric Loyer, 2012; http://erikloyer.com/index.php/projects/detail/upgrade_soul/)

It requires different type of skill set like creation, editing, image manipulation, web coding, usability and design interface, sound production skills and Production basics to incorporate multiple media into focused storytelling endeavor.

5. Transmedia

Distributing narrative across multiple media platforms for providing diverse, multiple yet connected and narrative experiences which are mainly focused on subject is involved in Transmedia digital storytelling. It is totally different from multimedia where multiple mediums are used to tell a story, also it bifurcates itself from cross media where the same story is told across different media. The functions of specific media and communities are leveraged as communicating platforms of different elements of story with the help of transmedia.

Every platform is precisely chosen for specific affordances to enhance the storytelling experience which excels at what it does, instead of bending to fit a central idea repurposed for multiple media. Every platform is a separate entry point to a story universe where each story is independent from other story. This results into multiple platforms contributing to an ecology of extremely creative and complex storytelling experiences. Also because of solid transmedia strategy, everything remains in context by a central narrative and theme. The separate parts of which can be complete and satisfying alone itself but getting together results into a far more powerful narrative than any single component. E.g. Matrix entertainment franchise.

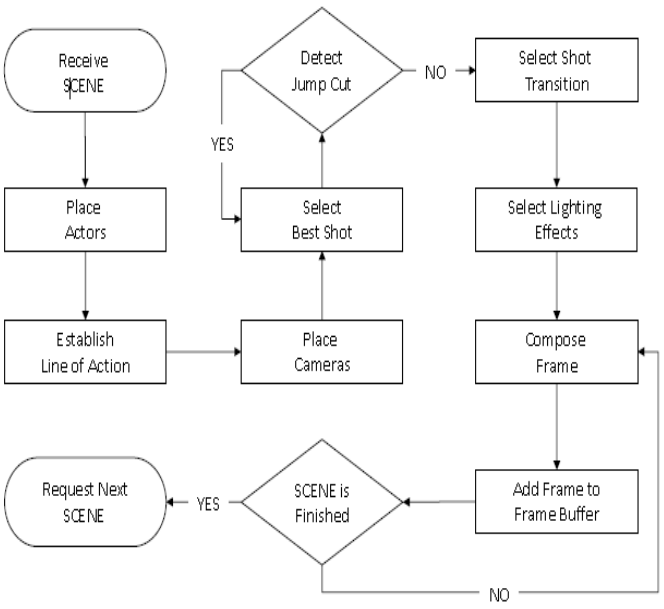
There has been written extensively by Jenkins about the contributions of fans to fictional story worlds. Fans not only expand but improve the story world by their creative contributions (fan fiction and fan-produced videos) and their speculation, theories, and questions (mainly in online forums). The benefits of audience engagement are not usually just limited to fictional story worlds. According to Edmond (Study of transmedia radio projects) encouraging intense and longer-term audience engagement normally helps to extend the total lifespan, overall reach and profitability of a single piece of intellectual property (Edmond, 2015, p. 1577). Transmedia storytelling may include other factors like live performances and geolocated games as well as printed books or pamphlets, online databases, and on-site audio tours (Aufderheide, 2015, p. 69).

6. Film Compositing

The compositing process consists in assembling the visual elements that compose the scenes into a single piece of video. The goal is to create the illusion that all elements always existed in the same location. In real filmmaking, this process usually is manually done by several special effects professionals that work for days in short video segments to create realistic scenes. In video-based interactive storytelling, however, this process must be done in real-time and without human intervention.

As a traditional film, a video-based interactive narrative must have a cinematic look and be composed of a variety of different shots, camera movements and lighting effects. In order to create such cinematic interactive narratives, actors and settings are both shot from 8 different angles with intervals of 45° during the production process. In this way, the system has the freedom to compose scenes from different angles, simulate camera movements and create more dynamic video sequences that cover all the important aspects of the cinematography theory. However, handling such tasks without human intervention requires the development of fast and intelligent algorithms to apply the cinematography techniques to create attractive and engaging visual representations for the story events in real-time.

In the proposed video-based dramatization system, the agents Editor, Cameraman, Scene Composer and Director of Photography share the responsibility of compositing the scenes according to the information provided by the Director agent. The compositing process is divided into several steps, as illustrated in the flowchart of Figure.



The compositing process starts when the Scene Composer agent receives a new scene structure for dramatization. The first step of the compositing process consists in defining the basic setup for the scene by placing the actors that are participating in the action on the available waypoints of the location. Then, the Cameraman agent establishes the line of action and places the possible cameras to shoot the scene according to the spatial information of the scene setup. Based on the available cameras, the Editor agent selects the best angle and type of shot to film the scene. Then, the agent verifies the occurrence of jump cuts. If a jump cut is detected, a new camera angle is selected; otherwise, the agent continues the process and selects the most adequate shot transition (cut, dissolve, wipe or fade). Before starting compositing the frames, the Director of Photography agent enters in the process and selects the best lighting and color effects to emphasize the emotional content of the scene. Finally, after defining all the visual aspects of the scene, starts the actual process of generating video frames representing the scene, which is the most time-consuming

task. Once a frame has been generated, it is added to the frame buffer to be shown to viewers. After all frames have been successfully composed, the Scene Composer agent requests the next scene structure to be dramatized.

7. Augmented Reality (AR)

Augmented Reality (AR) is a newly developed technology that involves the overlay of computer graphics on the real world as shown in the picture.

In general context AR is termed as Mixed Reality (MR), that refers to a multi-axis spectrum of areas that cover a blend or either of Virtual Reality (VR), AR, telepresence, and other related technologies. Virtual Reality relates to computer-generated 3D environments which allow the user to enter and interact with synthetic environments. The users can "immerse" themselves to varying multiple degrees in the computers artificial world which may either be a complete or partial simulation of some form of reality or the simulation of a complex phenomenon.

The above picture shows AR example with virtual chairs and a virtual lamp. In telepresence, the fundamental purpose of all this technology is to extend operator's sensory-motor facilities and problem-solving abilities to a complete remote environment. In this sense, telepresence may be defined as a system with the interface of human/machine in which the human operator receives sufficient information in the form of data about the teleoperator and the task environment, displayed in a sufficiently natural way, that the human operator feels physically present at the remote site. It is very much like virtual reality, in which one aims to achieve the illusion of presence within a digital or computer simulation, telepresence aims to achieve the illusion of actual presence at a remote location. AR can be stated as a technology between VR and telepresence. Most of the times, in VR the environment is completely synthetic and in case of telepresence it is completely real, in AR the user is able to see the real world augmented with virtual objects. At the time of designing an AR system, three aspects are always taken in consideration (1) Combination of real and virtual worlds; (2) Interactivity in real time; (3) Registration in 3D. Most of the times it has been seen that wearable devices, like Head-Mounted Displays (HMD), could be used to show the augmented scene, but other technologies are also available.

8. Artificial Intelligence

Artificial Intelligence can be described as the capability of machine learning just like humans and the ability to respond to certain behaviors also known as (A.I.). Artificial Intelligence is increasing every with such a very high speed that some of the computer scientist are predicting observations like by 2020, "85% of customer interactions will be completely managed without a human". ("Gartner", (n.d.)). This gives us the impression that humans simple request will be depending upon computers and artificial intelligence will play an important role in storytelling just like when we use Siri or Galaxy to ask about telling stories of Ramayan or Mahabharat. AI offers many things like reliability, cost- effectiveness, solve complicated problems, and make decisions; in addition to this, AI restrict data from getting lost so that there will not be any information loss structure in the communication process. One of the great tools in AI is stated as "reinforcement learning" which is based on the simple fact in real life of testing success and failure to increase the reliability of applications.

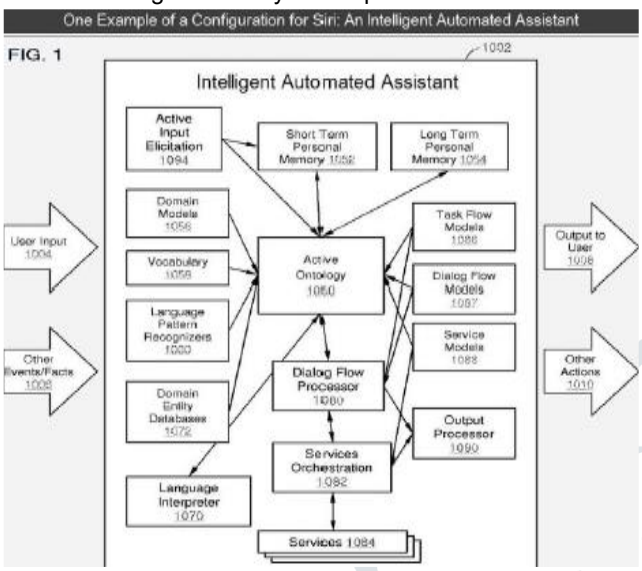
AI is designed using lots of algorithms which helps the system to determine the expected response that will basically tell the computer what to expect and proceed working accordingly. Some of the AI applications that we use in our daily life without knowing:

1. Voice recognition
2. Virtual agents
3. Machine learning platform
4. Ai optimized hardware
5. Decision management
6. Deep learning platform
7. Biomatters
8. Robotic process automation
9. Text analytics and NLP
10. Adaptive Manufacturing:

The most common applications of AI that we use daily is Virtual Assistants such as Siri, Cortana...etc.

8.1 Siri Virtual Assistant

Siri is the mostly used and very well-known virtual assistant which uses voice recognitions and text typed to perform a certain task within a specified device. Siri is considered as one of AI most widely used applications. The application simply takes the required input from the user such as (e.g. Call Mom) and tries to find the most related keywords which are used in this command. Siri also tries to eliminate inconsistent result using the language pattern recognizer and from there to active ontology by performing a search through the contacts, then it tries to relate the contact named “Mom” and performs the task which in this case is “Calling” and finally the output of this action will be “calling Mom” and to consider all the possible situations.



One Example of configuration for Siri AI

9. Virtual Reality

Virtual Reality can be stated as a technology which caters to highly interactive, computer-based multimedia environment in which the user becomes the actual participant in a computer-generated world (Kim et al., 2000; Onyesolu, 2009a; Onyesolu & Akpado, 2009). It is the complete or partial simulation of a real or imaginary environment that can be experienced visually in the three dimensions of width, height, and depth which may additionally provide an interactive experience visually in full real-time motion with both sound and most probably with tactile and other forms of feedback. VR becomes a way for humans to visualize, manipulate and even interact with computers and extremely complex data (Isdale, 1998). It is an artificial environment created with the help of computer hardware and software and presented in front of the user in such a way that it appears and feels like a real environment (Baieier, 1993). We can look virtual reality as a completely or partially computer-synthesized, three-dimensional environment in that a plurality of human participants, appropriately interfaced, may engage and manipulate simulated physical elements in the specific environment and, in some of the forms, may engage and even interact with representations of other humans, past, present or fictious, or with invented creatures. It is a computer-based technology for simulating audio visual and other sensory aspects of complex environments (Onyesolu, 2009b). VR incorporates 3D technologies which give a real-life illusion. VR mostly creates a simulation of real-life situation (Haag et al., 1998). Therefore, VR is refered to an immersive, interactive, multi-sensory, viewer-centered, 3D computer-generated environment and the overall combination of technologies required to build such an environment (Aukstakalnis & Blatner, 1992; Cruz-Niera, 1993). VR technology breaks down barriers between humans and computers by immersing viewers in a computer-generated stereoscopic environment. In this technology computer technology is used to create right-eye and left-eye images of a given 3D object or scene which simulates the completely natural stereoscopic viewing processes. The viewer’s brain generally integrates the information from the given two perspectives to create the perception of 3D space. It definitely shows that VR technology creates the complete illusion that on-screen objects have depth and presence beyond the flat image projected onto the screen. This is the technology where viewers can perceive spatial relationships as well as distance between different object components more realistically and accurately than with conventional visualization tools (such as traditional CAD tools) with VR technology.

10. Immersive Media (IM)

Immersive Media can be defined as media that stimulate physical senses to the point where we experience psychological immersion, can also be referred as telepresence. IM make users so involved in the filmed, photographed, synthetic, or mixed environment that they get an impression that it is real, and they are present in that environment (so called “being there”). Established Media can be immersive as well. Any medium possesses two defining aspects: the edition and the distribution (Miège, 2003). In this context the meaning of “edition” is the adaptation of content into the medium through editing, filming, post-production, etc. and “distribution” means the spread of the edited content to make it accessible for the audience. Examples from the past gives us the impression that media also evolved with a third aspect, the aspect of a medium finding its specific location in a physical or virtual form.

IM have followed a path that is consistent in how content creation and distribution are performed. As technologies are getting cost effective, this should result in these IM technologies soon being affordable to a wider audience.

IM and the cinema are quite a natural team as both share similar kind of roots. The classical setting of a cinema with seats in front of a screen may be modified by swapping in a headset, allowing for a familiar setting for the target audiences. Technology allowing the creation of 360° videos quickly inspired the media companies to experiment with producing in this more immersive format. Applications such as Oculus TV allow for this possibility. Currently, VR and AR applications are dominated by gaming. The VR Zone Tokyo from the Japanese game company Bandai Namco has a great success with the games like Super Mario and Space Invaders.

As social media has revolutionized the creation of traditional print, audio and broadcast media, the creation of content with IM could also take the production of audio-visual content to another level. This format has developed slightly with technology, such as IMAX, and now has achieved new highs with a 360-degree 3D sphere of area available for display. Some of the examples how new technologies can make it possible to transform flat 2D content to spherical IM content. IMVERSE (https://www.imverse.ch/) allows for creation of volumetric content. Depth prediction and 3D reconstruction done by Volume GL (https://volume.gl/) allow for embedding existing film clips into an IM experience. Conversion of TV pictures into an IM experience is now also possible, as seen in the example where a soccer game can be experienced on one ‘s own table (http://grail.cs.washington.edu/projects/soccer/).

11. Conclusion

The sense of spatial awareness and telepresence that comes with IM always allows for potential new uses in Story telling settings that may not simply mirror how other mediums have been used for storytelling. The spatial component of IM can be directly extended to useful story telling experiences that have a spatial component, such as geography, geometry, and anatomy. However, the telepresence that is achieved by IM allows for a higher level of engagement than may be achieved with other mediums. This increased engagement may offer educational benefits even for non-spatial content where attention or engagement are difficult to maintain with other mediums.

The contribution of immersive media in the field of storytelling with its audio, vision, and interactivity features is unprecedented sense of immersion. About IM people often refer to “being there”, rather than referring to watching or doing something. This gives a deep impact on the relation of the audience to the medium. The novelty of IM also involves a technical progression: the combination of completely accessible sensorial technology with a closer screen proximity than ever before opens new opportunities for audiences. The future of storytelling lies in IM as a new medium which can only work when everybody has the knowledge about every medium. This means that it is very essential to have each of the above i.e. traditional storytelling formats, print medium, audio and broadcast medium, Artificial Intelligence (AI), Augmented Reality (AR), Virtual Reality (VR), Mixed Reality (MR) etc. This follows logic because editorial work along with the distribution of the content are often based on current models, making use of existing app stores, platforms, websites, social media, or location-based offers. This makes it easier for IM to access because the audience is touching ground with a new technology on a known terrain. It can be said that while the distribution of IM follows established 17 models, the telepresence of IM is the primary key factor to open a range of opportunities to create and experience presence, empathy, and immersion.

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36. Artificial Intelligence Advanced Analysis and Design: CNIT 380 Instructors: Dr. Hiba Tabbarah & Mr. Abdullah Abdulghafar
37. citeseerx.ist.psu.edu/viewdoc/download