Filmby Aarhus / VIA Film & Transmedia / Create Converge – European Union North Sea Region VB programme

STORYTELLING BEYOND THE SCREEN

Creating Narratives For Immersive And Interactive Spaces

Interreg
North Sea Region
Create Converge
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Storytelling Beyond The Screen

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Storytelling Beyond The Screen

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Photo Credit: VR Connect - 3 locations, one conference
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Launch of this.festival in 2017 with visual poem "Skærmøjne" from rapper Per Vers

Foreword

This book is part of Create Converge. Create Converge is an European Union North Sea Region VB programme financed project which is intended to support the development of creative industries focusing on the increasing convergence with other sectors:

"Creative technologies are seeing increasing convergence. Using a mix of all the creative screen tools is invaluable for helping people to enjoy content, understand information and interact with it. Beyond entertainment, they offer applications for training, service delivery and marketing."

https://createconverge.eu

We live in a time when new genres, formats and technologies are bringing new dimensions to cinematic storytelling. It is an exciting new day for innovative narrative concepts that will surprise the audience and fellow creators alike with their many shapes and sizes. In theory, there are no limits to where these new narratives can be experienced, or who or what can interact with them. The wall that used to keep audiences and stories separated is not just going away, we get to walk through it and explore the story world beyond the screen.

At VIA Film & Transmedia and Filmby Aarhus, we are constantly working on and exploring the many new possibilities, theories and practices that are necessary to set a direction for the cinematic storytelling both for now and the future. Part of the reality of working with the new dimensions of storytelling is that there is no one solution or definite set of rules because they are constantly evolving, meaning our creative journey has no end in sight.
Like any book, this anthology captures a moment in time of its publication, showing the knowledge and insights we have now while also looking forward to what is to come. With this in mind, we would like to thank the writers that have made an effort to share their expertise and develop theories and methods, which will not only to be of value today but also for times to come.

We are truly delighted that we have been able to create this book for a new generation of story creators. As is often the case, good partners are needed to make things happen. Therefore, we would like to thank the European Union for sharing in our interest and taking part in our venture as partners in Create Converge – European Union North Sea Region VB programme. Together, we have been able to make this publication a reality.

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TAKING THE NEXT STEP IN THE EVOLUTION OF STORYTELLING

Taking The Next Step In The Evolution Of Storytelling

The story and the audience-experience come first, technology second. Currently, this is established as the shared convention across different disciplines that allows the audience to immerse themselves and interact with a wide range of creative content. The writer knows it just as well as the designer, the engineer and the media specialist. Sometimes, the commercial media machines of the world seem to forget it, and when they do, they often pay the price in the form of the audience's indifference. Missteps aside, we have entered an era for storytelling and narratives to shine in many new ways, from digital to physical spaces, across platforms and with the audience at the centre of the story, not on the outside looking in.

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ABOUT THE AUTHOR

Klaus Sommer Paulsen
Klaus has always been a storyteller and a designer. He first began telling stories when he was a child to a small crowd in the schoolyard. Fast forward to recent times, he has been working professionally in the merging disciplines of integrated marketing, storytelling, digital media and experience design since the 1990s. He has had a number of roles including those creative director, facilitator, speaker, lecturer and board member of organisations such as the Themed Entertainment Association. Furthermore, he has founded companies in Europe and North America, including the Integrated Storytelling and Experience Design Studio AdventureLAB.

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It is easy to almost dismiss the significance of technology when making the valid point that it should not be what drives the story forward. However, technology and its adaption by the audience are changing the form of the story and, thus, the storyteller's role. Technology and storytelling are not two different entities. They are converging to create something new, fascinating and intriguing to both the creators and the audiences, and in doing so, blurring the line between who is the creator and who is the audience. To deliver intriguing stories today, one has to not just think about what goes on inside its narrative structure, visuals, audio and all, but also what transpires around the framework that surrounds and supports it.

TECHNOLOGY AND ITS ADAPTION BY THE AUDIENCE ARE CHANGING THE FORM OF THE STORY AND, THUS, THE STORYTELLER'S ROLE.

This is part of an evolution of story-based experiences that did not just happen in recent years but is part of a longer evolution. The convergence of different disciplines that we see come into full fruition today began decades ago, and as creators and producers, we need to understand that when we take the path of pioneering narratives, it is one that is continuously moving forward, arguably at an ever-accelerating speed.

For an understanding of what the future holds, let us take a short look into the past. The already existing history of convergence and innovative storytelling and media production holds valuable lessons as well as the key to unlock new possibilities, which you may find yourself.

From emotion to function to functional emotion and emotional functionality

Innovation

In 2004, a significant change of direction for interactive design manifested itself in the book "Emotional Design"[1] by Donald Norman. In the preceding years, the rise of interactive multimedia had opened the doors to new disciplines of design and interaction with the audience—still somewhat limited by means of physical distribution such as CD-ROMs—before the internet created a global connection between the audience, the creators and the content.

With the new possibilities of mixing media types with interactivity, creators started to challenge and push forward the evolution of the story and space behind the screen. One of the first multimedia design certification programs, which later became a credited degree in design, was even called Space Invaders. From its humble backyard beginnings in Aarhus, Denmark in the early 1990s and later on its premises in a more mundane part of Copenhagen, hundreds of veteran and influential multimedia designers were unleashed upon the industries of marketing, design, entertainment, game development etc. joining an international community that was on a quest to positively invade and innovate the space beyond the screen.

During the early days of the mainstream digital revolution, innovative designers and developers presented exciting new ways of experiencing the story, either through merging media, interaction, or indeed, both.

The playfulness and richness of the ideas from this time brought about some astonishing new media innovations, that may have just started as interactive doodles on a computer desktop. What we should keep in mind today is not to let go of the experimentation and playing around with possibilities. Even when somebody tells you that you can't do things in a certain way, try it out. Dare to try, fail and venture beyond the current playbook. You may come up with something that eventually becomes the next big thing.

DARE TO TRY, FAIL AND VENTURE BEYOND THE CURRENT PLAYBOOK.

Interactivity

MYST (1993)[2] was arguably the first mainstream hit of the gaming industry, reaching an audience beyond gamers and computer nerds. Although it was sometimes berated by gamers and other game designers for not being interactive or game-like enough, its undeniable adoption by a wider audience meant that it reached a million copies sold, overshadowing everything else on the CD-ROM market at the time. MYST was a comparably simple mystery game where one had to explore imaginative surroundings and solve various riddles. Its format made it perfect for point-and-click mouse exploration, and the depth of the story made up for the

1 *Norman, Donald: Emotional Design: Why We Love (or Hate) Everyday Things, 2004, 2005 Basic Books*
2 *MYST, Rand Miller & Robyn Miller, 1993 Cyan, Inc*

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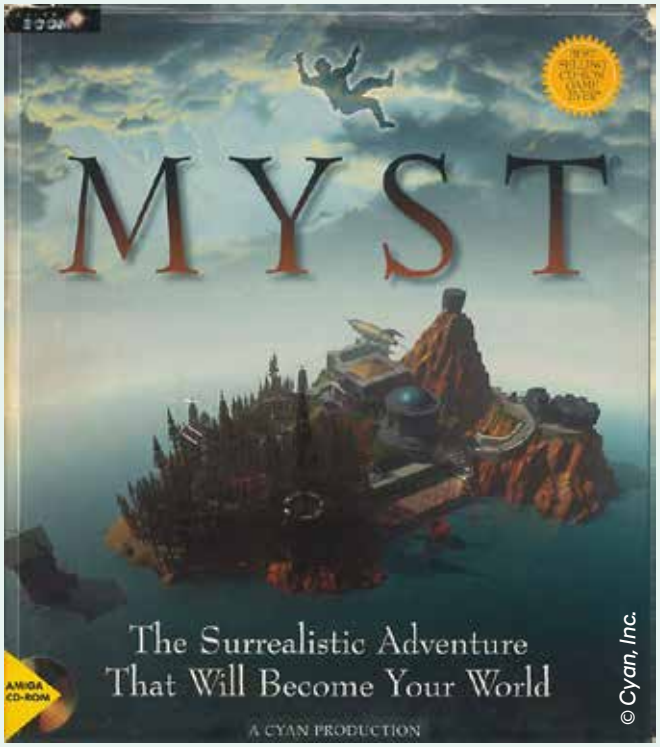
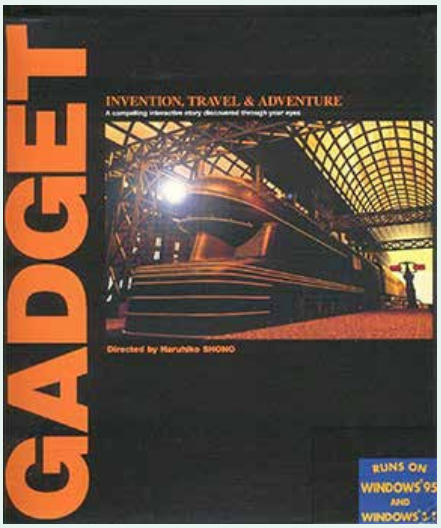


lack of fast, typical game-like interaction. This was arguably the key to its success; anybody with a simple understanding of how to use a computer could join in the exploration of the world of MYST. Regarded as a classic today, the game is still available as an enjoyable experience, even though the 3D graphics may seem a bit dated compared to our contemporary highly advanced graphics. MYST marked the evolution of the story to become explorative, challenging the audience to solve riddles to be able to move ahead in the story in a digital, designed space. Newer, more technologically advanced games use this exact same recipe, and exploration still plays an essential part in virtual worlds and augmented realities. Just think of recent open-world game successes like Horizon Zero Dawn and Red Dead Redemption 2 that are not only based on story and action, but also the exploration of the space in which the player-experience unfolds.

Several attempts at creating interactive stories for home were developed at the time of the release of MYST as well; some more successful than others. When new technologies and methods for designing, developing and creating new story experiences get adapted, not only by the creators but also by the audience, evolutionary steps in the audience-story relationship are taken. The ideas that would otherwise have found their way as words into books, essays, poems, marketing on so on merge with visuals, audio and interactivity in ways that can attract and include the audience in the story and the message.

Gadget: Invention, Travel, & Adventure (1993)[3] was an interactive adventure, in which the main protagonist, a government agent, was searching for a missing scientist. Most of the action takes place at railway stations or on trains, during which the protagonist engages in conversation with different characters to unlock clues that advance the story. The story structure of Gadget is quite linear by nature, and it has often been described as an interactive movie rather than a computer game. Still, it allows users to interact with the story and advance it forward successfully, and was, just as MYST, an early lesson that audiences do not always crave highly interactive game experiences. The right amount of interactivity is not a set value; it depends on content, presentation and audience.



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If everything were supposed to be interactive, it would be so by now, as the technology to achieve this has been around for a substantial time. When we create story-based, interactive experiences today, we do not start from scratch, as the discipline of interactive storytelling has been explored by both the academic and the business worlds for decades. The format is still developing, but there are important and valuable insights to build upon. One is that it is demanding to an audience to be interacting at a high level all the time, because sometimes we just want to lean back and absorb great content as members of a passive audience rather than active users.

Experience

There are, of course, many other examples than the ones above that make for advancements in how to create and design the audience experience. The value and power of the experience itself

3 *Gadget: Invention, Travel, & Adventure, Haruhiko Shono, 1993 Synergy Interactive*

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made its way into other aspects than that of the storyteller. Famed software designer Kai Krause boldly created tools that would evolve as the user, and often a graphics designer spent more and more time working with them. Any graphic artist or designer whom themselves explored what could be achieved with cornerstone tools like Adobe Photoshop during the 1990s, will fondly remember the KPT Power Tools suite of plug-ins.

In the world of strategy and business, Pine and Gilmore coined the term the Experience Economy in an almost prophetic article and book, and we now realise how not understanding the power of experience can take down not only businesses but industries altogether. Relating this to today, not understanding the value of the story-experience relationship may limit the potential of a narrative, story or not, in ways that are potentially harmful to its success with audiences.

Just imagine that the Walking Dead had never gone from comic to television to games and theme park attractions. Or that medical education never evolved beyond the textbooks to make its way into virtual reality training, leaving the aspiring doctors to test their capabilities on limited, real physical subjects. Both examples would have gotten stuck in their tracks and not evolved beyond their origin.

If we take a look at the legacy of storytelling, its presentation has of course always added to the experience of the story with the use of staging, actors, sound, props, sets and so on. A dull production or poor acting can destroy even the best of screenplays, and a lacklustre experience makes the audience indifferent or even turn against its creators. The significant evolution and revelation lie in prioritising the total experience, as seen, heard and felt by the audience. What happens around them when the story is presented with or without a stage, or a screen, has a high impact on how the story experience is remembered and retold. For creators and producers, it is essential to keep in mind that we now live in a world that has become rich and full of memorable experiences, and that we always compete with anything that beckons for people's attention.

THE SIGNIFICANT EVOLUTION AND REVELATION LIE IN PRIORITISING THE TOTAL EXPERIENCE, AS SEEN, HEARD AND FELT BY THE AUDIENCE.

Connectivity

With the emergence of the World Wide Web, a slew of massively impactful factors were added to the relationship mix of creator, content and consumer. One was connectivity; we all became connected, rendering distances increasingly redundant month by month. Another was the immediate drop in data transfer rate and the rise of functionality-centric interaction design.

Although the rate with which data, and as such media, could be transferred from a CD-ROM to the screen was limited, it was still many times faster than that of data being downloaded on a 33K or 56K baud modem. When content was being installed on a hard drive, that difference in speed was multiplied even further. So, as interaction design branched into web design, a need for optimised, limited, downloadable content became a primary concern. Furthermore, the increasing number of function-specific websites such as banking and shopping pushed a focus on doing it with a few clicks of a button. Design with a specific emphasis on usability and user-friendliness distanced itself from entertainment

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and what was considered disruption on a path that should contain as few clicks as possible for the user to complete their tasks—as advocated by usability experts such as Jakob Nielsen.[4] The entertainment part did not go away, but seemingly, in most situations, there seemed to be two almost disconnected directions for digital media: Fun or Function.

The lesson learned is that with limitations, regulations and rules will follow, sometimes to the point of seemingly taking a chokehold on creativity. However, restrictions do not stop new ideas in its tracks, the perception of not having space for creativity does. Fact is, even within the wonderful new world of transmedia, next-generation narratives, and new experience possibilities, unlimited creativity is a myth. You will still have to be able to work within a box of confinements such as what the technology can do, audience number and behaviour and not at least, budgets and timeframes. Now, how you find a way to rise above the limitations and disprove the naysayers will be part of what defines you as a creator and producer of great, unforgettable moments.

Emotion

A significant change was about to happen with the convergence of Fun and Function, and the connecting point would prove to be Emotion. Yes, that age-old ingredient that makes us embrace both story and experience and creates a connection between audience, character, storylines, people, spaces and even objects.

In the early 1990s, the Japanese researchers Masaaki Kurosu and Kaori Kashimara claimed that not only did people prefer beautiful things over ugly ones, people would also think that attractive things worked better.[5] They made the hypothesis that more aesthetically designed user interfaces would have an impact on how the level of ease-of-use was perceived by users of an ATM. Testing proved the more elaborated design to be regarded as being better by test subjects, even though the basics of the user interface such as screens, button position and actions was the same.

As is the case with any advancements in science, including that of the science of interaction design, test results and reports can be put to the test itself by peers. Aesthetics having an impact on the user experience was claimed to be hugely affected by the land and culture in which the test was conducted; Japan. Consequently, the whole experiment was also done in Israel, as it was claimed people there were less prone to the impact of the use of more elaborate, colourful design. However, the positive effect of these elements, in particular, had an even higher, positive impact on the Israeli test subjects. In other words, there was scientific proof that the convergence of Fun and Functionality had value, and not only for what some would deem on a superficial level. The mental state of the users was more positive, making for a better user experience. After all, the brain works better when it is not distracted by negativity.

As hinted at with the first words in this chapter, this change in interaction design-thinking slowly but inevitably manifested itself outside of the academic world, such as in Donald Norman's "Emotional Design". The book itself was triggered by the combination of one of the world's leading authorities on functional design, a radio show and an old coffee pot.

When Donald Norman published his earlier title "The Design of Everyday Things",[6] it had a significant emphasis on the importance of functional values. It can rightfully be considered a milestone in interaction design and was considered the new standard by many in a digital world that was going from early multimedia aesthetics and exploration (Fun) to that of the more information technology man-machine task focus (Function). However, as is the nature of milestones, milestones are to be succeeded by the next of its kind on the road when moving forward.

Donald Norman appeared on a radio show, talking to the host and callers about design and functionality. Immediately recognisable to the readers of his book, its cover is decorated by an image with a coffee pot with the handle wrongfully placed below the stout of the kettle, making it impossible to pour anything without getting scolded.

During the show, a woman called in who owned not necessarily the kind of useless hot beverage vessel as portrayed on the cover, but an iconical blue kettle. Many people recognised it, and knew that the kettle is far from perfect, becoming overall too hot to pick it up with your bare hands. Still, the woman made a claim that made a significant impact on Donald Norman's perception of the value and nuances of design and his future work.

The woman loved that old kettle, no matter its flaws and imperfections. Her emotional connection to it was so powerful that it overshadowed any functional disadvantages it had.

This lead up to the publishing of "Emotional Design" in 2003. While the book is not the only advocate of the power of emotions and their role in engaging and lasting design experiences, it is significant that an advocate of Function embraces the value of Emotion. Design is way more nuanced than function, and bringing together disciplines moved the evolution and impact of interactive media forward all across the board, regardless of purpose or industry.

4 *Nielsen, Jakob: Designing Web Usability, 1999 New Riders*
5 *Norman, Donald: Emotional Design: Why We Love (Or Hate) Everyday Things, 2004 Basic Books (1st Edition)*
6 *Norman, Donald: Emotional Design: The Design Of Everyday Things, 1988 Basic Books (1st Edition)*

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You may ask: why is this shift in the interaction and experience design mindset still so important to us today? That is because this is where history has an imminent probability of repeating itself. Whatever you are working on, evoking emotion and creating meaningful connections is at the core of your success. It does not matter if you are doing immersive training or interactive entertainment, what you do will need to be capable of making the audience feel something that makes the experience worth their while and that will hold a place in their hearts and minds. New possibilities in production technology can distract us from that, as we get infatuated with what we can do, and immerse ourselves into guidelines, rules and best practices from a technological perspective. When that happens, the creators and producers may think that their output is amazing, but they fail to make a meaningful connection with the audience, as what the team just created was not for the audience anyway. They ended up creating something with no value for anybody else but themselves and their professional peers, void of story or emotion.

NEW POSSIBILITIES IN PRODUCTION TECHNOLOGY CAN DISTRACT US, AS WE GET INFATUATED WITH WHAT WE CAN DO, AND IMMERSE OURSELVES INTO GUIDELINES, RULES AND BEST PRACTICES FROM A TECHNOLOGICAL PERSPECTIVE.

Storytelling by design

As we can learn from the above advances through the last decade of the previous century, narrative and media convergence is a continuous, fluctuating process that has been going on for a longer time than we can immediately imagine. It does not begin here and now with the latest technological advancements. Furthermore, we cannot see its end; we only have a glimpse of what lies beyond the horizon. However, there will be several periods of many more significant moves forward and sometimes, even backward. We are at one of those thresholds right now, influenced by events set in motion by earlier points of convergence, such as the merging of functionalism and aesthetics as well as the massive merging of story and experience. The latter merging point is the very foundation for themed entertainment and brand immersion. We are at the point where everything we have learned as storytellers is to be merged with other disciplines and used in different contexts that will challenge the very nature of the story-audience relationship.

WE ARE AT THE POINT WHERE EVERYTHING WE HAVE LEARNED AS STORYTELLERS IS TO BE MERGED WITH OTHER DISCIPLINES AND USED IN DIFFERENT CONTEXTS THAT WILL CHALLENGE THE VERY NATURE OF THE STORY-AUDIENCE RELATIONSHIP.

As a storyteller and designer-oriented, story-experience designer, I arguably have a bias towards design. However, I will dare to make the claim that I am objective in putting forward design and design thinking as a recurring practice to create connecting points between the audience, the narrative and the experience and that the next step in convergence is bringing the story and design even closer together. In doing so, we must not only tell stories but design them, keeping in mind that the audience, not ourselves or the message, are at the centre point of the convergence. In doing so, we utilise principles across the width of the spectrum; the storyteller's connection with the audience, the designers' inclusion and interaction with the audience, and so forth. The very nucleus of the next step in narrative convergence is what happens when we bring the audience together with, and even into, the story.

Unlocking the space beyond the screen

When technological advancements happen, they can have a massive impact on the creation and absorption of different narratives. In the end, of course, they need to be welcomed by the audience, who, if they do not embrace new developments, will ensure redundancy. For example, following the hugely popular 3D feature film Avatar in 2009, many television manufacturers launched 3D television sets for home use, only to see low interest from customers. 3D seemed to be something for the cinema experience, and home television adaption soon turned towards higher consumption of streamed content, predominantly television series created for a format of continuous viewing. At the time of this writing, there is a lesson learned here that needs to be taken into consideration for any current technological advancement, such as that of VR: where and how will it succeed, and how long will its success last? When reading this some years after the release date of this book, VR may have given way to something

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else, or have become ubiquitous in and out of the home. One thing is certain: the adoption of the audience is now what makes or breaks advancements.

This has and will arguably always be the pitfall of being part of a creator's culture, where the new is exciting, and everyone is exploring what can be done. In one's deep engagement with a particular media or technology, one's objective vision of how it will be embraced by a wider audience may be obscured. Even for established platforms and technologies, there are no certainties; they may still be left behind by the audience. Just have a chat with those marketing gurus of yesteryear, who are still struggling to figure out how to engage with and influence a new generation with entirely different media (and buying) habits than their parents and grandparents.

As we move beyond the single screen or even multiple screens, convergence needs to happen at multiple levels when challenging how the story is experienced or influenced by the audience, as well as be adaptable to and synchronised with dynamic audiences.

In this new user-centric, or rather audience-centric, journey beyond the current screen, there will still be a need for the specialists, as well as for the generalists. They need to come together, even embracing disciplines that require different training, different skillsets that may not seem immediately relatable. Going too far in either direction may result in creativity with no finalised output or production by the numbers without any new thinking. The convergence that drives the new story experience is in itself multidisciplinary and multidimensional. The new breed of storytellers needs to see and challenge the world with the same level of nuances to succeed.

When the audience is the hero

We need to move the audience into the centre of the story, and to do this, we challenge crucial elements of the story itself. The simple, yet extremely powerful tool *The Hero's Journey* is not only usable as a step-by-step guideline for the unfolding of a hero adventure. It is a point of connection from traditional storytelling to audience-inclusive narratives, from the audience celebrating the hero, to becoming the hero.

In Adam Berger's book "The Audience is The Hero"[7] this connection is showcased as the theme park visitor's journey, as

a physical movement through the experiential narrative. Other elements of storytelling and filmmaking can be translated into both space and experience, and the key component of this transformation from story to narrative is allowing the audience to play another part, and being able to tell the story not just as an idea but as it is seen and felt by them. Design principles that put the user at the centre of development need to be merged with narrative tools to create a new kind of story world, one that surrounds and engages with the audience. Only then can the audience indeed be the hero.

The shift of audience role and power is not an academic discussion or a possibility for creators to opt in or out of. People are by now used to having some sort of interactivity and influence available, and easy access to media tools and online distribution enables the immediate creation and immediate sharing of any kind of content imaginable. We build our own narratives about brands and services on social media that have the power to take down businesses. We create new material merging that already exists to create something new. We edit what we are not satisfied with, or we create our own stories as an extension to established franchises. What is made may not be part of an official canon, but when well done, it will be taken to heart by the fan base, even if it is just as an afterthought of the official story world. There are different kinds of fan fiction and creations out there that are considered by many to be better than the official material.

7 *Berger, Adam M.: Every Guest is a Hero: Disney's Theme Parks and the Magic of Mythic Storytelling, 2013 BCA Press*

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There is a crucial question here for the story creator or owner to take into consideration. I have had the good fortune to ask it to both aspiring and established storytellers, marketers and other kinds of creators of narratives around the world during various sessions. The question is at once straightforward and momentous:

How much power over your story do you want to give away to your audience?

The reactions and replies to the question are captivating, inspiring —and to some extent, polarised. Some are fiercely protective of their creation, wanting to control every letter, second or pixel. Others are experimental and explorative, wondering what might happen if they let the audience take their base premise in new directions, perhaps influencing or even co-creating the story.

The question is asked to animate the audience into the discussion. However, it is, in a certain way, a trick question. It is extremely hard, if not impossible, to not let anyone, to some extent, take some control of your story. One thing is that both words and videos can be edited and shared online. With AI and the use of deep fakes, making it possible to let any known person act and say as you please, this will be taken to a whole new level. Furthermore, regardless of what format you present them with, the audience is not necessarily passive and stationary, seated in a chair, entirely dedicated to the consumption of the creator's latest masterpiece. The role and the modality of the audience have become much more varied because of technology, and the storyteller needs to not just look beyond the screen, but at what surrounds the audience once they are met on the other side.

The new ground beyond the screen

Not long after the professional media industry realised that something was happening with Oculus Rift, I was invited to a VR gathering mostly arranged by and attended by movie and video professionals. Many good people were doing great things there, but I could not help but wonder: where are the spatial storytellers, the architects, the ones who are capable of making a room or a space tell a story? The discussion at the meeting was still very much tied to a screen, that now had just become a 360-degree screen. However, being able to look around a space does not make that space fully explorable, something that is even more evident when the audience is fixated to one point. If we go beyond the screen, we need to go all the way in our design and construction of what we find there. That may mean that we need to make spaces and objects tell the story as well, not only telling the story through the voice and actions of the narrator and the character. The story-based experience is made up of not only the story and the audience, but also the space where they engage with each other.

THE STORY-BASED EXPERIENCE IS MADE UP OF NOT ONLY THE STORY AND THE AUDIENCE, BUT ALSO THE SPACE WHERE THEY ENGAGE WITH EACH OTHER.

Bridging principles of story with principles of experience

As a storyteller and content creator who is about to explore how an invitation for the audience to immerse themselves in your story becomes a physical, literal thing, you may wonder where to begin. Luckily, you actually are not starting from scratch. These principles you may be well-versed in, or even just been introduced to, can be transformed into story-based experience design principles. This way, some of the established models and terms provide you with an excellent foundation for establishing principles for the audience literally immersing themselves into your story.

Adam Berger used the Hero's Journey to create a physical Mythical Round as a means for taking the audience through a themed space. In his book "The Immersive Worlds Handbook" (2013), Scott A. Lukas addresses how traditional narrative principles can be developed further for the creation of a design story. A design story is told in a three-dimensional space and utilises whatever the audience may encounter in that space—architecture, technology, actors, performances etc. It is everything that comes together to create the story-driven audience experience of the space. Add to this mindset the consideration of the role and the journey of the audience, and you have the three key design elements to take your story beyond the screen:

The Story
What is the story? What is the theme? What is the message? Etc.

The Audience
Who is the audience? What is their role? What is their function? Etc.

The Stage
Where does the audience engage with the story? What is the function of the space? What spaces or media are combined? Etc.

These three fundamental elements come together to create the story experience as witnesses through not just the eyes, but the senses of the audience. Furthermore, we can bridge traditional storytelling with experience design to create storytelling by design.

KLAUS SOMMER PAULSEN
TAKING THE NEXT STEP IN THE EVOLUTION OF STORYTELLING

Examples of bridging principles

	Traditional Story	Story Experience
Three-Act Structure	Setup, the confrontation and the resolution.	Before, during and after a key moment or the full experience.
Hero's Journey	The outer and inner journey of our main protagonist.	The spatial and inner journey of our audience.
Plot or Narrative	Pacing, action and events that take place through characters.	The audience journey that takes place through different spaces and elements.
Perspective	Created through voice and literary techniques.	Created with visual cues, design, features and elements of space.
Theme	Presented through the actions of the characters, the nature of events and sometimes the narrator.	Manifested through design of the themed space and its features, of various degrees of subtlety or explicitness.
Characters	Expressed through their action in various scenes and events.	Expressed through architecture, technology, actors and the audience themselves.
Setting	Produced through evocative language and actions that give a sense of the place.	Produced through forms of spatial design with the attention to detail that makes up the space that surrounds the audience.
Plot Twist	The story makes a significant change from the expected.	The experience makes a significant change from the expected, enhanced through dynamic change of the space, turning a corner, opening a door etc.

Paying credit where credit is due: This model was heavily inspired by, and can be seen as a further development of, Scott A. Lukas' "Traditional Story versus Design Story"[8] model.

Creating story experiences that go beyond the screen takes more than technological convergence. It takes the combination and merging of disciplines that are utilised to create great stories and experiences, and the key to creating experiences is a design mindset. However, as you can see, the domains of the storyteller and the designer are not far apart, and convergence and merging of disciplines already have a history of its own; there are plenty of insights and inspiration to build upon. Your journey as a story designer may, in fact, have already begun, and you are ready to make advancements forward in understanding and exploring what lies beyond the screen. All it takes is a step forward, and then you'll be on your way.

CREATING STORY EXPERIENCES THAT GO BEYOND THE SCREEN TAKES MORE THAN TECHNOLOGICAL CONVERGENCE. IT TAKES THE COMBINATION AND MERGING OF DISCIPLINES THAT ARE UTILISED TO CREATE GREAT STORIES AND EXPERIENCES, AND THE KEY TO CREATING EXPERIENCES IS A DESIGN MINDSET.

8 *Lukas, Scott: The Immersive Worlds Handbook: Designing Theme Parks and Consumer Spaces 2012, Focal Press*

Photo by Michel Catalisano on Unsplash

STORYTELLING BEYOND THE SCREEN

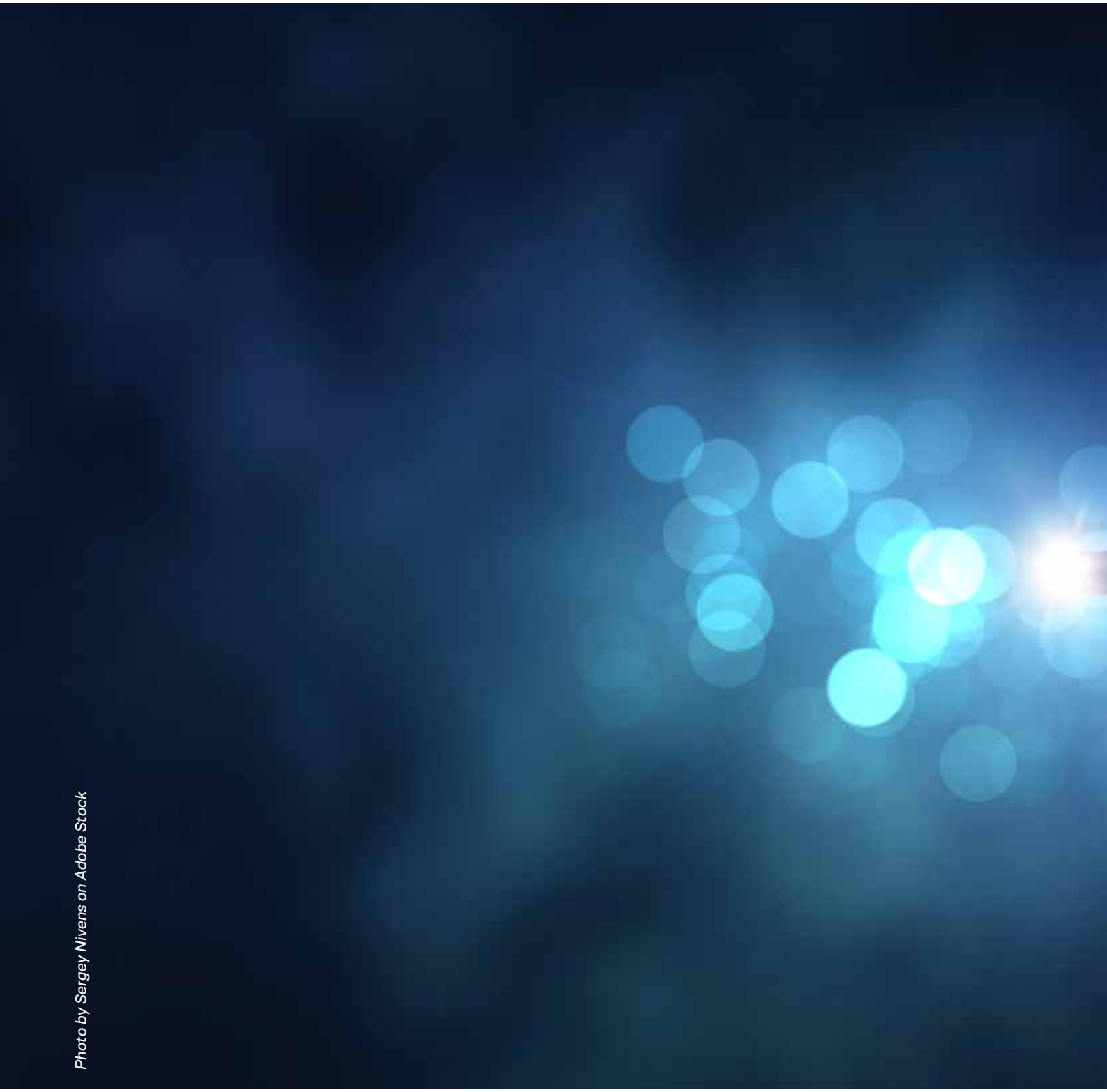

Photo by Sergey Nivens on Adobe Stock

Expanded Realities

When we leave the concept of the screen behind, we find new realities where every element of a narrative can come to life and awaken our senses by design, sights, sounds and smells. As we twist and turn to explore a story world that is no longer confined and defined by the limitations of televisions and the screens of our digital devices, these moments of exploration stays with us. The theme and the setting are not only presented to us in words and visuals; it is also told in sensory code, making the narrative come alive and making an impact on our physical memory.

In the following chapters, we begin our journey into the new realms of storytelling and content creation, by taking a look at how realities can be expanded with the use of not just technology, but the awakening of the senses in new ways.

You will see how VR is taken further by combining the virtual and physical space in hybrid installations, that let the audience experience come full circle, as the technology-enhanced virtual narrative itself is enhanced by real-world sensations, and as such, go beyond the limitations of technology and hardware.

You will almost be able to hear how sound concept design takes the audible dimension further than scores and effects when it becomes part of an experiential space, shared with an audience. Our deeply rooted perception of sound and its impact on us provides a compelling opportunity for any creator and producer, and those with career titles that have not even been defined yet.

Behind-the-scenes photos from the production of Separate Silences (2017), where the main actors had to wear a POV head mount in order to film stereoscopic point-of-view footage for the experience.

SIGNE UNGERMAND & MARIA HERHOLDT ENGERMANN
HYBRID REALITIES

Hybrid Realities

Defining hybrid realities in VR: the mix of tech, film, theatre and gaming

We are living in an exciting age of endless possibilities within entertainment. Technology is developing faster than ever, and while new platforms are evolving, one specific type has caught our eye and imagination as a creative team: the magical world of Virtual Reality (VR). This medium is what most storytellers, up until now, could only ever dream of. The ability to engage an audience within your story world and center the action around them opens up new doors that are ready to be explored, in order to create the next generation of media entertainment.

SIGNE UNGERMAND & MARIA HERHOLDT ENGERMANN
HYBRID REALITIES

ABOUT THE AUTHORS

Signe Ungermand
Signe Ungermand is an award-winning creative filmmaker and producer. Her primary work consists of technical solutions within VR production and post-production and she has spent the past four years specialising in cinematic virtual reality. In 2017 she cofounded MANND alongside Maria Herholdt Engermann. MANND's mission is to create VR and AR experiences both for commercial and entertainment purposes, striving to create the next era of branded content, film and shared experiences. Many of Signes' experiences have been exhibited at some of the largest A-ranked film festivals across the world, gaining both national and international recognition.

Maria Herholdt Engermann
With a Bachelor's Degree in VIA Film & Transmedia, Aarhus, Denmark, Maria has a deep passion for creating immersive experiences, especially within VR. She is an award-winning creative VR experience designer and producer with her primary work is within the creative borders of VR production, consulting and strategy-planning on optimising experiences. In 2017 she co-founded MANND alongside Signe Ungermand. Many of Maria's experiences have been exhibited at some of the largest A-ranked film festivals across the world, gaining both national and international recognition.

SIGNE UNGERMAND & MARIA HERHOLDT ENGERMANN HYBRID REALITIES

THIS MEDIUM IS WHAT MOST STORYTELLERS, UP UNTIL NOW, COULD ONLY EVER DREAM OF.

The dictionary's current definition of hybrid is: 'anything derived from heterogeneous sources, or composed of elements of different or incongruous kinds'[1].

With the ever-shifting media entertainment paradigms, new platforms, mediations and narrative techniques are being merged and composed, evolving into what we classify as hybrids. This chapter will explore hybrid realities within virtual reality, referring to the art of in-betweenness in mixing genres like tech, film, theatre and gaming. The purpose of this technical mediation of hybrid concept development is to merge real and virtual worlds, originating from different genres. The real and virtual content co-exists and transcends the audience through technological augmentation.

"THE ART CHALLENGES THE TECHNOLOGY, AND THE TECHNOLOGY INSPIRES THE ART."

John Lasseter[2]

Now more than ever technology transforms the way we, as a society, consume media entertainment. The electronic ecosystem changes as well with an introduction of a pipeline structure. This structure moves on three different stages: out of home (Stage 1), in-home (Stage 2), mobility (Stage 3).

Think cinema: it started out as an out-of-house social event, such as with drive-ins, having audiences leave their home to consume the story. As television was introduced, the vast majority enjoyed the entertainment in front of the screen at home. When the mobile phone was launched, its audiences no longer had to be constrained to be within four walls but were able to move freely around, having the entertainment as an extension of their own arm. As for the gaming industry, it has gone from the meeting areas called arcades, to compete with home-based game machines, to game consoles anyone can carry with them on the go, for example, a smartphone or other mobile device.

Within theatre, there has also been a significant transformation. Theatres started off being solely location-based, performed on a stage with a similar setup like cinema. Throughout time, theatre performance has developed into what is called immersive theatre today. From this, the theatre has become slightly more mobile, as some touring theatres now offer service packages involving private performances at a given location of your own choice, e.g. events like weddings. To differ from the other formats like cinema and gaming, theatre still prioritises one of its core values: live human interaction.

Virtual, hybrid realities are still very much in their first stage; most are location-based experiences, with stories and virtual worlds that the audiences can experience at a specific location. The essence of these experiences is not just to change the environment as we see it, but to create a deeper and truer sense of presence in this virtual world. That becomes possible by using established features from film, gaming and theatre.

The current elite within human-driven & non-human driven VR

Hybrid virtual reality experiences come in many different shapes and sizes; some are self-driven—also referred to as non-human driven—while others are facilitated (known as human-driven). Both have shown huge potential for the future of media entertainment, and have become recognised emerging entertainment types; some for their technical ventures in leading the way forth, others for diving into the storytelling potentials for multilayered universes that our human bodies can't experience through flat screens.

Non-human driven
Carne y Arena (Flesh and Sand) by Alejandro Innaritu

The experience:
You carefully take a step forward, feeling the sand glide between your toes, a faint breeze blows in the distance. As you realize you're walking in a never-ending desert, the sun sets beautifully over the mountains and you hear sounds of people approaching from the distance . A group of Spanish-speaking immigrants appear between the bushes and trees, a family of all ages—children, grown-ups and elderly, with one of the women holding a baby. They don't recognize your presence, but you feel very much there. From that moment on, you follow their dangerous journey through the night, in an attempt to cross the border to the U.S.

[1] *Dictionary.com, LLC: Hybrid, 2019 Houghton Mifflin Harcourt Publishing Company https://www.dictionary.com/browse/hybrid*
[2] *Lehrer, J. Steve Jobs: "Technology Alone Is Not Enough", 2011 The New Yorker http://www.newyorker.com/news/news-desk/steve-jobs-technology-alone-is-not-enough*

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Audience member wearing the HTC Vive Pro connected to a HP VR computer portable backpack for a wireless virtual reality experience.

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At the time of this writing, Alejandro G. Iñárritu—the four-time Academy Award-winning film director—premiered in 2017 with his newest exploration Carne Y Arena. This piece is a VR installation that shows the story of migrants trekking across the Sonoran desert into the U.S. Based on authentic testimonials by the immigrants themselves, the six and a half minute solo experience allows for a complete exploration of the 2,500 square feet desert in which you travel alongside the virtual migrants seen through the head set.

The sensorial experience incorporated sandy terrain, twirling winds and the shaking of the entire building, as a virtual helicopter enters from right above one's head in the ending sequence where the illegal immigrants get caught.

Carne y Arena is a ground-breaking piece, especially within the cinematic world, and it is the first ever VR piece to be granted a Special Achievement Academy Oscar by the Academy of Motion Picture Arts and Sciences. As the awarding Academy jury stated: '...[it] opened for us new doors of cinematic perception... Inarritu's multimedia art and cinema experience is a deeply emotional and physically immersive venture...'[3] In perspective, the last cinematic experience to have received a similar award was 'Toy Story' in 1996.

The Oscar awarded to Carne y Arena testifies that the Academy of Motion Picture Arts and Sciences—an established, well-known institution—is now recognising the mediated technology and story methodology of VR as a serious cinematic expression.

THE ACADEMY OF MOTION PICTURE ARTS AND SCIENCES —AN ESTABLISHED, WELL-KNOWN INSTITUTION— IS NOW RECOGNISING THE MEDIATED TECHNOLOGY AND STORY METHODOLOGY OF VR AS A SERIOUS CINEMATIC EXPRESSION.

A statement such as this makes it very appealing for more cinematic directors and artists to search for the potential and exploration of the medium, hence increasing the popularity and knowledge of VR.

Human driven
Alice The Virtual Play by DVgroup

The experience:

You are pushed into a dark infinity room, while a distant voice shouts 'Alice, you're late'. You stand in front of a box, looking down at your virtual hands as you curiously open the lid; cards flickering out at every angle. A White Rabbit appears from the darkness. He asks you a question; you don't respond. He states it's impolite not to answer when someone addresses you. You fumble around with a few words, confused. The White Rabbit replies: 'Now that's better, you CAN actually talk. You're late!'

'Alice The Virtual Play' (referred to as Alice) is a 2017 VR production created by the Paris-based award-winning VR innovation studio DVgroup, founded in 2011. Their mission is to blend different genres and formats, pushing boundaries and norms of what immersive experience can be envisioned as, focusing on social interactions and creating 'tomorrow's brand experience and VR entertainment'[4]. Alice premiered at the 2017 Venice Film Festival and is a re-enactment of various scenes belonging to the popular fairy tale 'Alice in Wonderland', where audiences, in real time, physically interact with some of the well-known characters and objects.

Progressively, audiences come to understand that they are Alice and start engaging with the environment through this persona, leading to transcendent, provocative and utterly hilarious situations.

Alice is a testimonial to what awaits for the future of cinematic interactive VR experiences, with gaming elements incorporated. The piece is a technical achievement in the world of VR story-telling, allowing users to feel as if they have complete control over the direction of the story as well as making them feel free to interact with any of the favourite characters at their own premises. All virtual characters are played out by an actor in a motion-capture suit, who navigates and improvises, depending on what signals he reads from his audience; are you the silent, playful or rebellious type? Designing Alice as part improvisation piece is an excellent way of tailoring the experience in density, speed and complexity.

[3] *BBC: Alejandro Inarritu: Carne y Arena Awarded Special Oscar, 2017 BBC News https://www.bbc.com/news/entertainment-arts-41786923*

[4] *DV: We Are An Innovation Studio Crafting Tomorrow's Brands' Experiences And VR Entertainment. 2019 DVgroup https://dv.fr/about/*

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DESIGNING ALICE AS PART IMPROVISATION PIECE IS AN EXCELLENT WAY OF TAILORING THE EXPERIENCE IN DENSITY, SPEED AND COMPLEXITY.

As a layout of a possible economic model for ambitious immersive works of this calibre including real-life actors, Alice is still in its infant stage[5] . The creators' plans are, as of 2019, to have an advanced extension of the story that will be able to accommodate twenty-five audiences simultaneously, facilitated by five actors in motion capture suits. The experience will be sold through individual higher priced tickets in order to make a profitable revenue after three months of showing—that is if every ticket gets sold. DVgroup believes that there is a market for more expensive and unique experiences such as these, comparing their product to the world famous and recognised theatrical experience Punchdrunk's 'Sleep No More'.

Non-human driven
The VOID by THE VOID

The Experience:
You look around, reach out, and feel the nearest wall realizing that you can physically feel every bump in the wall, and see every joint of every finger on your virtual hand. You notice a portal, and while walking through it, twenty-two different haptic modules start shaking all over your body. At the end is a temple that you walk towards and an entirely new world arises in front of you. Welcome to the VOID[6].

The VOID is a first-of-its-kind completely tetherless hyper-reality full-body VR simulation, run only by machines. It was founded in 2015 by former Magician C. Hickman alongside K. Retschneider and J. Jensen. The envisioning of The VOID stretched further than just one experience, but presented multiple branded experiences that would encapsulate an audience from head to toe—literally. This is achieved by equipping every viewer with a head mount, backpack, and responsive vest that is programmed for most tactile gestures. The ground that the audience walks around is also enhanced with sensorial effects such as wind, heat, water, etc. Combining a play area with knowledge from the magic industry, Hickman uses illusion design, misdirections and magic theories in his VR productions to create the illusion of reality. He has incorporated age-old principles of magical illusions to create convincing, imaginative pathways, where a small space seems larger than it is. That was a significant progress for sizeable virtual reality experiences of this dimension. As an example, one level is designed to look as if audiences have to walk down a long straight corridor, but where they are actually walking around in circles without noticing it[7].

The VOID is ground-breaking on multiple levels. Besides being one of the first pioneers to successfully create larger location-based VR experiences with physical effects and technology far more mature of its time in 2016, they are also the first to truly challenge the business model of immersive location-based VR experiences as a concept. With technology way more advanced than anyone else had been able to offer at the given time, they took the chance to partner up with companies like Sony Pictures and Disney to create well-known franchise VR experiences like Ghostbusters and Star Wars.

In 2017, The VOID was accepted into the well-known Disney Accelerator program, and from there on they have opened 'experience centres' in multiple locations, some of them being Atlanta, Georgia; Dallas, Texas; Hollywood, California; New York City; Philadelphia, Pennsylvania; Santa Monica, California. Other than succeeding in opening minor theme parks all over the USA, their brand has also stretched internationally to, for example, London, Dubai and Toronto. An exciting kick-start on what we know today as location-based VR arcades, and a potential for the future of new media entertainment.

Case Study: Separate Silences

The Experience:
Waking up from an unconscious state, you see a girl lying in the hospital bed across from you, where a nurse is writing notes in her journal. She turns off the table lamp and walks towards your bed, presenting her face with a reflection of sadness. She sits down by your side, takes your hand and strokes it. In that same moment, your corporeal hand gets stroked by a hand too. You now know that anything between the real and virtual world can, and will, happen to you.

5 *Hoguet, Benjamin: Alice, The Virtual Reality Play: When the Real and the Virtual Meet 2018 CMF Trends https://trends.cmf-fmc.ca/alice-the-virtual-reality-play-when-the-real-and-the-virtual-meet/*

6+7 *Hall, Charlie: Welcome To The Void, 2016 Polygon https://www.polygon.com/features/2016/5/5/11597482/the-void-virtual-reality-magician-tracy-hickman*

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The Insta360 Pro 360 degree camera on set.

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Behind-the-scenes photos from the production of Separate Silences (2017).

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Introduction and motivation

Separate Silences—original title in Danish: Hver Sin Stilhed—is a hybrid cinematic VR experience created by five students from VIA Film & Transmedia, Denmark, headed by ourselves, Maria Herholdt Engermann and Signe Ungermand alongside director David Glahner Wedel, producer Mette Alsen Vittrup and PA & Communication Amalie Grynderup Kroun. The goal of this bachelor's project was to challenge the use and understanding of 360 live-action recordings, seeking to explore what the relatively new medium could achieve when merged with other genres. The project focused on multiple factors, such as how technological mediation and social involvement could impact the participant's experience of simulated realities.

The name itself, 'Separate Silences' is an indicator of the multiple perspectives that come together to tell a complete story. The word 'Silence' refers to the limited capability of interactiveness in this live-action setting. As part of being 'paralyzed' from coma and sleep paralysis, the viewer is unable to act upon any occurrences that they become spectators (or victims) off.

THE NAME ITSELF, 'SEPARATE SILENCES' IS AN INDICATOR OF THE MULTIPLE PERSPECTIVES THAT COME TOGETHER TO TELL A COMPLETE STORY.

The experience consists of a theatre-like setup with two physical hospital beds and an immediate surrounding complimenting that of a hospital with white bedding and drip on a rack. Each bed has a VR headset—containing a different P.O.V (Point of View) story from either of the two protagonists, a brother and sister called Noah and Rebecca.

The story begins just after an accident, where both characters are in critical states, leading them to hover between coma and sleep paralysis at the hospital. Throughout the performance, the audience experiences how the virtual characters perceive themselves, their bodies and the occurrences around them while being sedated. Slowly they uncover that the doctor trying to help them is their father. Through a new undocumented serum, the father tries bringing his children back to life, but in doing so, ends up endangering them. The two storylines are complementary to each other, giving the audiences the possibility to share similarities and differences once re-emerging from experience, which adds an extra layer of storytelling to the post-experience.

Production and installation

As part of the notion of realism within the virtual environment, it was crucial that the sensorial installation stayed true to the story and the viewer's experience. To strengthen the perception of embodiment the experience was accompanied by physical stimulation; including physical human contact, scent and nature stimuli as wind. Despite the audiences not being able to interact with the environment, the environment can and does interact with them. It can, therefore, be argued that the viewers transcend from being passive to passive-active participants. Hence, the corporeal body is nurtured in the same manner as the virtual.

The production process wasn't without some obstacles. As VR considerably differs from traditional filmmaking, the scriptwriting of Separate Silences became an iterative trial-and-error process due to both technical solutions and inclusion of physical effects. In order for effects to be implemented, every element had to go through an approval process, being tested by numerous audiences in focus groups, to determine the value of the physical effect.

AS VR CONSIDERABLY DIFFERS FROM TRADITIONAL FILMMAKING, THE SCRIPT-WRITING OF SEPARATE SILENCES BECAME AN ITERATIVE TRIAL-AND-ERROR PROCESS DUE TO BOTH TECHNICAL SOLUTIONS AND INCLUSION OF PHYSICAL EFFECTS.

While some worked perfectly from the first try, such as the touch of a hand, others needed alteration. An example is the needle, which can cause fear. The dummy version showed an actual needle being inserted into a virtual hand while the audience members felt a pinch from a wooden stick. 75% of audience members were so shocked that they screamed and tore off the head set. Even though they all enjoyed the realism of the needle many wished for it to be dimmed. In the final version, the virtual bodies are already equipped with a liquid drop in their hand, and the needle is now a *needleless* syringe where they instead feel a slight pinch and water dripping down the hand. The response was well received amongst audiences, and this effect then became an integrated part of the experience.

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Another issue we encountered at the time was that there was no off-the-shelf 360-degree stereoscopic P.O.V. VR camera, so we had to use a custom rig that was initially 180 degrees from two modified GoPros. However, this limited the F.O.V (Field of View) for the audience as their vision would hit a 'black wall' containing no visuals. Because of that, we decided to use two 360-degree cameras, and cover 100 degrees that contained the actor's face. For the premiere, we stationed the audiences in a hospital bed as a compliment to the virtual body positioning, and with the natural neck rotation span of 260 degrees, the last degrees were no longer an issue.

Filming with a homemade stereoscopic setup revealed the importance of the distance between the two lenses. Humans have different lengths between the eyes: men's eyes are generally closer to each other than women's, and this has to be imitated with the technological setup. We therefore had to measure both male and female eye distance in order to find the average so we could ensure the most effective stereoscopic setup. Otherwise, nausea was likely to occur. We ended up with a 6.3 cm distance, which got positive feedback from the test audience.

Production of the two 22-minute VR films was very time consuming, and it took 96 hours to make the final finished export. This was more than we expected, and we have since improved the process and enforced an effective work (and workaround) pipeline to ensure a more seamless production.

Concept development for hybrid virtual realities

Experience Design

VR is about letting audiences be in that specific moment, and when working within this medium, it is a matter of creating powerful experiences. Therefore, it's highly relevant to look into the theory of Experience Design to better understand the relationship between experience and audience. A helpful tool for guiding content creators on how to build an experience is 'The Psychological Structure of Experience' by Christian Jantzen, a researcher in Business Communication and Culture Analysis at Aalborg University, Denmark[8].

Jantzen's Model: The Psychological Structure of Experiences

Jantzen's work is often referenced to when discussing Experience Design as a transformative process. His theory is based on dividing an experience into three separate stages: change, reflection and transformation. He argues that an experience occurs when the interaction between external stimuli, inner motivation and the expectation from the individual merges, based on previous social and cultural experiences and traditions.

An experience is when a change in the condition and behaviour of the audience occurs, putting previous perceptions in a new perspective. This leads to audiences reflecting on the experience, which can result in a transformational state from one's prior perception, behaviour and/or routine[9].

When humans encounter an experience, a change on the physiological plan occurs. The breathing and pulse changes. Emotions are evoked. When people compare prior knowledge to new knowledge, they reconsider their expectations, dreams and self-acknowledgement. This can lead to transformation of the Self. This transformation consists of the interaction between old habits and the new reflected perspective[10].

An example of this could be a viewer with no previous or little relationship to a refugee's situation watching a documentary on the subject. If the documentary managed to create a powerful impact on the viewer with a subjectively emotional experience, it could affect the viewer in such a way, that they change perspective. If an emotional relationship to the subject is established upon reflection, it is more likely that the viewer is willing to donate to the cause or commit to stronger participation through participating in demonstrations or doing voluntary work. Referring to the 'Godfather' of VR, Chris Milk, who calls the VR medium the 'ultimate empathy machine', content creators have a newer, powerful tool in creating work that gives audiences another form of attendance within the experiences, letting them be there first hand.

In Separate Silences, the audiences experience a lot of changes on the physiological plan from the very first steps towards the experience. Audiences are received by two facilitators who introduce them to the technology and environment. After being placed in the bed, the expectation rises. When audiences enter the virtual world, another change happens, as their vision and hearing are replaced with a virtual substitute. They experience a visual body-swap, seeing through the eyes of another human being, having little control over their virtual presence, which challenges the normal perception of their self from a bodily perspective. The audience progresses through the story, feeling every tactile and proprioceptive aspect on their own corporeal body. Multiple senses are activated, affecting their body physiologically.

[8+9+10] *Jantzen, Christian, Vetner, Mikael and Bouchet, Julie: Oplevelsesdesign, 2011 Samfundslitteratur*

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The experience creates a change in emotion for the audiences. After re-emerging from the head set, it is entirely up to the audience to reflect on the experience. They can do so by sharing information with the other participant. However, some choose to compare it to their personal experiences and reflect individually. Separate Silences sets forward to give the audiences a new inspiring venture, challenging their previous perception of a cinematic experience.

Sense of Embodiment in VR

In the case of VR, the terms 'immersion' and 'presence' are often used interchangeably. However, presence is a subjective state and it should be considered the product of immersion that enables transparency of the used VR peripherals: *'Presence can be measured as the degree to which the virtual environment faithfully evokes a sense of reality that causes the user to suspend disbelief. The greater the suspension of disbelief, the greater the degree of presence achieved."* [11]

The central aspect in the philosophy of how we understand the world, and thereby presence, is that we observe and act within the world through our bodies. What does it feel like to own, control and be inside a body? The Sense Of Embodiment Theory (SoE) consists of three components—sense of self-location, sense of body ownership and sense of agency—that reflects on self-recognition: how a person perceives being in a state of the self, both mentally and physically. The body becomes a vital tool for interaction and centre of the premises within the VR experience.

Sense of Self-Location

The first component of VR embodiment is Sense of Self-Location that refers to the space that is seemingly the location of the viewer. This can be in terms of an avatar or disembodiment; a so-called out-of-body experience. However, having a physical body to relate to in first-person perspective is part of the human's self-consciousness, which largely enhances the sense of self-location, suggesting that first person perspective (FPP) is more effective than third person perspective. Due to the acceleration in technological advancements over the course of the past twenty years with new mediated interfaces, a presence cannot, and perhaps should not, be understood as merely a physical state. Some may even argue that being online is a direct synonym of presence. As the expansion of technological offers increase, humans live in a more artificial three-dimensional space: "In all these [virtual] worlds, users project themselves into the environment via an avatar: a 3D body which they control and whose appearance is often customisable.' [12]

The avatar's role is a lot broader than a mere practical figure in terms of communication needs: it is the virtual embodiment that gives users the visual representation[13]. As embodied beings, our bodies are our keys to identity[14].

Taking this into account, it is beneficial to incorporate the theory of Peripersonal Space (PPS).

PPS imitates the space surrounding one's physical body that stretches from the skin to the distance of an arm's length. Objects that are within the PPS can be interacted or manipulated with[15]. As objects enter within the PPS, they can be perceived as benign or potential threats, enhancing the consciousness of the perception of the physical body.

As Separate Silences was filmed stereoscopically, imitating the way humans perceive the world through their own eyes via the illusion of 3D, depth played a significant role in suspending disbelief. Throughout the experience, new characters were often introduced by stepping into the PPS of the audience's virtual character, to test if this notion strengthened the body awareness factor. Audiences would sometimes raise their hands with their palms sticking out, signalling for the characters not to come closer. Some would go as far as sinking their arms, pushing back their body and raising their shoulders, demonstrating a

[11] *Marinkovic, S.: First Rule Of VR: Don't Break The Presence, 2019 Tech Crunch https://techcrunch.com/2015/02/07/first-rule-of-vr-dont-break-the-presence/*

[12+13] *Ducheneaut, N., Wen, M.-H. D., Yee, N., & Wadley, G.: Body And Mind: A Study Of Avatar Personalization In Three Virtual Worlds. Palo Alto Research Center. 2009 National Chiao-Tung University, The University of Melbourne, Boston, MA, USA http://nickyee.com/pubs/Ducheneaut,%20Wen,%20Yee,%20Wadley%20-%20CHI%202009.pdf*

[14] *Idhe, D.: Bodies In Technology, 2003 University of Minneapolis Press*

[15] *Holmes, N. P., & Spence, C.: The Body Schema And The Multisensory Representation(s) Of Peripersonal Space, 2004 NCBI https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1350799/*

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The hybrid VR installation Separate Silences (2017) setup with two hospital beds in an atmospherical setting.

surrendering reaction. From that, we can conclude that foreign objects entering a virtual PPS can cause some audiences to react similarly, had they been observant to their own body.

Sense of Body Ownership

Sense of Body Ownership refers to the sensory information of visual, tactile and proprioceptive inputs on the body[16]. Based on pre-experienced haptic stimuli, the audience can predict how some of the new experiences will feel like on their skin.[17]

A recognised famous experiment demonstrating body ownership through a phantom limb is The Rubber Hand Illusion (RHI). The RHI was first conducted in 1998 by researchers M. Botvinick and J. Cohen[18]. Their hypothesis was that through perceptual physiology, they could manipulate a participant into believing that the rubber hand lying in front of them was their real hand. The construction of the design asked the participant to sit at a table with both hands aligned on the surface. While the left hand got hidden behind a divider, a rubber hand was placed in the same position on the visible side[19]. The facilitator would simultaneously and accurately stroke both hands with a brush[20]. Some minutes into the experiment, the facilitator would, without the knowledge of the audience, take a hammer from behind the divider and forge it into the rubber hand, shocking most audiences. The brain scan records showed an increase in brain activity where bodily movements are planned. A decade later, Slater imitated the experiment, however with a needle instead of a hammer, and this time the brain scan showed activity in the part of the brain that anticipates pain.

16 *Slater, M., Kilteni, K., & Groten, R.: The Sense Of Embodiment In Virtual Reality, 2012 Massachusetts Institute of Technology*

17 *Constantini, M., & Haggard, P. The Rubber Hand Illusion: Sensitivity And Reference Frame For Body Ownership, 2006 The University of Chieti, University College London, Department of Clinical Sciences and Bio-imaging, Institute of Cognitive Neuroscience and Department of Psychology. Elsevier.*

18 *Botvinick, Matthew & Cohen, Jonathan: Rubber Hands 'Feel' Touch That Eyes See, 1998 Nature*

19 *Botvinick, Matthew & Cohen, Jonathan: Rubber Hands 'Feel' Touch That Eyes See, 1998 Nature*

20 *New Scientist: Body Illusions: Rubber Hand Illusions, 2009 New Scientist https://www.newscientist.com/article/dn16809-body-illusions-rubber-hand-illusion/*

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From these results, it could be concluded that neuroplasticity had occurred between the participant and the rubber hand. Due to the stroking of both the real hand and the rubber hand, the participants felt like the rubber hand was their own.

In order to increase the fidelity of the virtual body within Separate Silences, it was necessary to incorporate additional stimuli beyond sight and sound, herby adding touch, smell and wind. Different from RHI, the conditions of our experiment were broadened to the entire body. Any tactile or proprioceptive action that was to happen on the virtual character would also be applied onto the audience's corporeal body. The stimulation performed in the VR performance wasn't a constant, but rather a continuation.

Throughout the 21-minute performance, the audience was physically touched—both over clothing as well as direct skin contact by characters perceived as 'good' and 'bad'—and smelled various different scents, where some were to provoke a sense of security and pleasantness and others were putrid. The outdoor feeling was also mimicked through wind, varying in intensity, depending on the location and overall climax of the story.

Furthermore, there was a certain tactile factor that varied to a great extent from RHI, where the act was to incorporate tactile stimulation that wasn't visual. Separate Silences explored the extent of mimicking the vivid situation of sleep paralysis, where testimonials from people often state an experience of a heavy pressure on the chest, almost as if someone was trying to suffocate them. Mimicking this gesture in Separate Silences took many people by surprise. This caused the audience to suddenly rise, because they no longer knew what the experience could expose them to. Before this, they felt safe with the premises of the touching. This did generate some paranoia amongst the audience, similar to what their virtual characters felt, too. This part of the performance triggered audiences into laughing, jumping, screaming and using their body to shield themselves by trying to remove or distance the pressure. As audiences started feeling their own body through their virtual body, a direct relationship was created between the two, similar to the RHI experiment.

Sense of Agency - story and technology

Sense Of Agency refers to having global motor control over one's own body, where the limbs act through the actions of one's personal choice[21]. Achieving this in VR requires peripherals, and is therefore mainly applied to experiences that have been designed through cross-platform gaming engines, where interactivity is a possibility to code into hardware and software. Despite few exceptions of interaction coded into 360 live-action content—such as teleportation from one scene to another, or choosing direction through gaze tracking—it is not possible for audience members to manipulate with the pre-recorded material in real time.

It is essential to state the premises of the respective VR experiences as they change for every experience. When guidelines have been set, audience members do not spend time wondering if they are acting according to the creators wish or not. The premises of being paralyzed in Separate Silences is introduced to the participants before emerging into the experience. They are asked not to move once they have been positioned: arms over the bed covers, resting by their side, mimicking the position of their virtual character. A common tendency amongst audiences is to try to lift their corporeal hand once they see their virtual body. Some test if they have been told the right information, others because they didn't understand the previously explained instructions. As soon as the audience registers that their corporeal agency cannot affect the storyline, most participants devote themselves to the premise of the experience; that of being in a paralysed virtual body with limited movement. The suppressed devotion in trying to live through the body and mind of their virtual character can seem imposed to start with, but as the story continues, many stated they gave in to the premises without even noticing it themselves.

Separate Silences restricts the viewer's agency with a completely non-interactive and non-manipulative storyline. However, the premises of the story were specifically written with the limitation of agency in mind. The motor control is seen as constrained due to the comatose state, not as a technological limitation. By reworking the limitations into a strength, the creators redefined the format's lack of interaction, by rationalising it through the storyline[22].

The social aspects

Humans are pack-beings developed with a social need from the early days, reinforced through Darwin's evolution theory. It is within the human social pattern to have the desire to be amongst others, and sharing experiences comes quite naturally to most. Social dynamic experiences can, therefore, serve as much more engaging than solo ones, having another person's viewpoint to relate to in a given situation.

According to a 2018 Survey conducted by Greenlight Insights, it may not be much of a surprise that 77% of VR users wish for more social engagement in VR, transcending real-life social patterns into virtual ones. The act in itself of putting on a head set isolates

[21] *Slater, M., Kilteni, K., & Groten, R.: The Sense Of Embodiment In Virtual Reality, 2012 Massachusetts Institute of Technology*

[22] *Grabe, Imke: Participant Involvement In Reality Simulation Experiences, 2018 IT University of Copenhagen*

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audiences from the rest of the world and natural interaction with others, making it a non-social experience. Unfortunately, from the early days of the second wave of VR, the medium has been struggling on the parameter of being social. Several technological solutions have started to appear. However, none of them are perfected.

VR USERS WISH FOR MORE SOCIAL ENGAGEMENT IN VR, TRANSCENDING REAL-LIFE SOCIAL PATTERNS INTO VIRTUAL ONES.

One of the more frequent, recent discussions is when VR will be mature enough to be a new online meeting room within an open world environment that has been popular within traditional open world games as previously seen with World of Warcraft, Counterstrike and Second Life. 2018 VR platforms such as High Fidelity, Rec Room and Facebook Spaces are all trying to connect people in the virtual environment and open up the possibility of a new social VR platform.

Other creators are focusing on how to make location-based VR experiences more social. For instance, VR arcades are gathering people within one space, and have multiple headsets allowing more than one player in at the time, called networking. The experiences are often within the genre of wave shooter games, where the audiences interact with each other in real-time, defeating the virtual opponent collectively. Another type of arcade, like The VOID, is experimenting with narratives more similar to those of escape rooms.

As for Separate Silences, restricted to the live-action format, programming social interaction parameters was at that time not an option, so the creators had to include the social aspect into the design elsewhere. This is how the story became to be told through two halves to make a whole, introducing two different perspectives from the characters Noah and Rebecca. The stories were written as seen through the eyes of two different people, each with their own personalities, views and age differences. Noah, being the younger brother, does not grasp the essence of the difficult family situation. He shows more innocence towards his childhood memories, as opposed to Rebecca, who understands the seriousness to a greater extent, distancing herself into a more emotional mindset.

Post experience, audience members lying in each of their beds started talking about what they had been experiencing, quickly noticing the differences in their recollection of the experience. The overall core of the story was told the same, sharing similar locations and events, however each had their own twist. If an audience were to see the experience alone, they would still grasp the essence of the story, but miss some vital pieces of information to understand relations, etc.

From what the creators have experienced, the feedback on the social aspect was that the audiences enjoy being able to share differences and similarities to the story. Some go as far as swapping beds and trying it again for the sake of their curiosity. Despite differences occurring in Separate Silences, the main conversation topic always falls back to the various stimuli that they have experienced on their own bodies, overall enhancing the unique sense of presence and embodiment between the corporeal and virtual body.

Feedback and Reactions

At the time of the premiere of Separate Silences in early 2017, to the best of our knowledge, nothing similar had ever been created before. Location-based hybrid VR installations were just starting to make their breakthrough, and 360° video was on its way to becoming a more common and understood term amongst the general public. However, most interactive pieces were solely based on animated worlds, with very few thinking that 360° film could bring more to the table.

The inclusion of physical effects through Mel Slater's theory of Embodiment combined within a full narrative in VR resulted in a unique, innovative concept. After the premiere, the piece received a noticeable amount of attention, gaining national and international recognition, being showcased at Cannes, Venice and Luxembourg Film Festivals amongst other minor venues in and outside of Denmark.

The verbal and written response on Separate Silences has been overwhelming. Audiences took the piece to heart as a transformative experience through the three different stages: change, reflection and transformation.

AUDIENCES TOOK THE PIECE TO HEART AS A TRANSFORMATIVE EXPERIENCE THROUGH THE THREE DIFFERENT STAGES: CHANGE, REFLECTION AND TRANSFORMATION.

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The overall storyline can be perceived as an emotional rollercoaster due to the seriousness in themes covering tragic accidents, the comatose state and family relations. This leads a majority of women coming out of the experience emotionally overwhelmed, some even crying. The recurring reason for the sentimentality is that being the sister, Rebecca, you lose a sibling, as Noah passes away towards the end. This is underlined in the last scene when they re-enter the hospital room, exposed to the empty bed across from them where Noah used to lie. To her right side, the father is sitting in a chair, crying and holding your hand before the end credits emerge. The audiences draw an emotional parallel connection to the horrid thought of them losing their own sibling. The experience has also triggered some people, who are afraid of needles, to over-exaggerate certain elements, by letting their fear overrule rationalism.

Post experience, they define the chemical smell from the injection as being putrid. This is an interesting observation, as the facilitator always uses a needleless tube with clear, clean water to perform the act. This type of reaction refers to the sense of body ownership theory of pre-experienced haptic stimuli and smell that was subjectively imposed on an act.

While the genre of the experience was never intended to be horror, the suspense of the story may lead some to perceive the experience as frightening. One of the virtual characters resembles a death-figure, who interacts with the audiences at various times throughout the performance, gradually increasing the intensity of physical touch with his long bony fingers. Towards the end, he lets his fingers crawl up the legs of your character. Some instantly become so frightened that they, without rationalising, quickly grab the quilt and try to cover their head underneath, soon realising that they are wearing a VR mount that is not affected when trying to be covered with a blanket.

Another reaction that leans towards pre-experiences was a remark by an audience, stating that she felt a surreal imitation of nostalgia from the childhood memory within the experience, the lighthouse. A place, where she herself had never been before, but suddenly felt a strong childhood connection to.

Audience members do not necessarily anticipate or associate smell with VR, but the very presence of smell seems to have a huge effect, leaving it to be one of the most memorial factors from the experience. Especially a lot of men crave a beer upon finishing Noah's experience. They had smelled it for 20 seconds in a cafe scene, 10 minutes into the experience. Smells in VR could, therefore, act great as a branding strategy for certain companies.

Lastly, summing up the extent of sense of embodiment, a lot have stated that they had a difficult time moving their corporeal body throughout the experiences, describing the paralysed state as being authentically imposed on their body. Some psychological element stopped them from scratching a nose and itching an arm, for instance, and only once they removed the head set did they regain full agency of their own body.

Summary

Concepts for hybrid realities allow the merging of respective genres, breaking the notion of traditional, and offering the viewer a never-before-seen experience. With the creation of these experiences, distribution designs typically go beyond a streaming service and are shown in real time at venues, involving interactions through installations. Therefore, all stages of production, including distribution, need to be finalised in the concept development phase.

Being aware of the VR medium's largest advantage; that the fourth wall is non-existent, allows the creator to involve their audience from a first-person perspective, making the viewer/participant feel as if the story revolves solely around them. Working not only with sight and sound, but incorporating the entire body, allows the audience to position their entire self much more within your piece, having a greater and everlasting effect on them.

Predictions for VR and Expanded Realities

The medium creates a whole new currency for storytelling. As John Lasseter states, 'Art challenges technology, and technology inspires art', meaning that more than ever, these mediated stories require a cross-disciplinary collaboration between artists and technologists for original pieces to exist within a hybrid genre[23]. With the development and breakthrough in computation and imagery technology, the terminology and best practices of VR will continue to evolve. One of the interesting tendencies to take a look at is the wish from the market to create photorealistic environments and characters for VR and AR experiences that one can interact with. This tendency introduces techniques like Photogrammetry and Volumetric Capture/Video, used to capture either static objects (photogrammetry) or movement (volumetric video).

[23] *George, James: The Brief History Of Volumetric Filmmaking, 2017 Medium https://medium.com/volumetric-filmmaking/the-brief-history-of-volumetric-filmmaking-32b3569c6831*

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Having different pipelines for games, video and VR is heavy on multiple resources—time, economy, efficiency. Another tendency closely interlinked to volumetric video is the overall futuristic aspect of production pipelines. Volumetric Capture can foster the way cinematic content of the future will be (partially) produced. This video technique captures three-dimensional space, allowing the creators to record actors or actions in real life and then afterwards shifting angles, rotations, speed and composition. The redefined cinematic approach to capturing content leans towards that from the computer graphic industry. However, the content acquired from this data can then be used for either flat screen or 3D experiences like video games, immersive VR or AR experiences. It will also be possible to give the shell of a character developed for VR/AR a life of its own by integrating AI/machine learning into its programming. From that, the virtual characters will not only be able to perform anything manuscript-based but will also be able to improvise, meeting expectations of what a real actor can offer to a scene that a scriptwriter wasn't able to foresee at the time of the scriptwriting.

The possibilities are endless, and the industry is still just scratching the surface. At the time of writing these words, VR as a medium is still evolving and finding its rightful place, as many others preceding it. The ultimate difference is that in this era of rapidly growing technological advancements, the VR medium may very well be one of the most well-financed and researched of its kind to be explored and experimented with by such a vast amount of different professions for many different purposes.

For a content creator, this is an exciting time to follow this development and a privilege to leave a footprint on the path to the future of media entertainment.

The lighthouse of Separate Silences located at Rubjerg Knude in Northern Denmark.

Photo by Denisse Leon on Unsplash

MANUEL FARIA
THE SOUND EXPERIENCE

The Sound Experience

About Sound

Sound is the echo of movement.

For millions of years, like most animals, we have relied on our auditory system to survive. Our brain processes what we hear about 800 times faster than vision[1].

This strong connection between our basic instincts and our auditory system makes us much more dependent on what we hear than anything else. Because of this, we analyse what we see, but we feel what we hear. This makes an enormous difference! A picture of a baby crying may have almost no effect on us, but if we hear the baby crying, the sound can have a strong effect.

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ABOUT THE AUTHOR

Manuel was born in 1957 and studied piano from the age of six. In 1976, he founded "Trovante", a famous pop band in which he was pianist and producer. Later, Manuel became a full-time music producer and specialised in music and sound for the marketing business for more than 30 years. In 1996, he created his post-production sound studio, Índigo, which has been awarded the title of "Best Company" for 15 years in a row by Portugal's leading marketing publication Meios&Publicidade. Manuel is passionate about the power of sound, exploring 3D sound for several years now. In 2009, he created 3D sound experiences for Vodafone, Nike, Mini and VW. He has won many prizes over his career including two Gold Lions in Cannes, as well as a silver and bronze at the LIA Awards. Currently, Manuel also teaches Music for Picture at the World Academy. He has been a keynote speaker at several conventions like the Cannes Lions, TNO in São Paulo and London, SAWA in Sydney, Eurobest, TEDx Lisbon and TEA@MAPIC.

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WE ANALYSE WHAT WE SEE, BUT WE FEEL WHAT WE HEAR.

We have absolutely no protection against hearing. Our ears work 24/7, and every sound that enters our ears affects us. We don't need to be paying attention or looking at a screen – sound can catch us anywhere, anytime. Moreover, our auditory cortex is hardwired to our amygdala, generating cortisol and adrenalin without our permission.

'I can't believe my eyes!' is a common expression. Yes, sight can be very deceiving, but, thanks to evolution, we tend to believe everything that we hear.

Having stated the above, there is a considerable path to be explored when using sound to make people live fantastic experiences. Also, because sound is so invasive, it leaves an open door to the unfortunate usage of sound. The movie 'Blade Runner' is an excellent example, with its incessant voice announcements intruding into and ruining peoples' lives.

Sound in hospitals has mounted to absurd levels, doubling in a single decade. In a survey in a Boston Medical Center ICU, 12,000 alarms were recorded in just a single day[2].

A soundscape has to be voluntary, i.e. we have to be able to turn it off, or it has to be so smooth that no one will feel annoyed by it. The sound designer has to take this into careful consideration at all times.

We are all so defenceless against sound that we, as sound experience creators, should always keep in mind how annoying and harmful it can be to people, no matter how clever or funny we believe that our ideas are.

Soundscapes and silence

All cultures have fountains placed in gardens, not because people would like to drink from them, or even look at them; they do because the sound of gentle water is pleasing to everybody.

In Japan, for example, *Suikinkutsu* is an ancient art of creating sound through the use of water in gardens. On a hot summer's day, this sound alone can make us feel cooler, which is remarkable. It also generates a kind of white noise which masks much-unwanted noise from the surroundings[3].

In this case, sound is being added to a soundscape, which was already pleasant, with birds, insects and a gentle wind.

For some time now, I have been conducting a continuous survey about people's preferences according to the five senses, and the results have been impressive: although each one of us has a different favourite colour, taste or smell, 55% of the respondents share the same favourite water sounds: ocean waves, river, fountains, rain. This may also be linked to evolution. We were born in a liquid environment, and our ancestors were nomads, travelling from one water source to another.

The rest of the choices people make regarding sound are mainly birdsong, wind and children's laughs. The one thing they all have in common? They are all natural sounds.

Even if we didn't have a better idea, I would say that a soundscape with those sounds would be perfect for environments like hospitals and other healthcare facilities. Those sounds reduce anxiety and make people happy and relaxed.

What about silence?

When we go to bed, we love to hear the sound of the rain in the background – millions of drops of water, creating a continuous flow of sound. However, if we have a broken tap in the bathroom, delivering drop by drop, we can't sleep.

The problem here is the relationship between silence and stimulus. We don't like absolute silence. Animals don't like it either. Silence triggers our brain to switch to alert mode. A recent experiment showed that silence triggers panic signals in mice[4].

[1] *We can hear sound vibrations from 50 millionths of a second (1/20000 kHz), but our visual resolution is just 4 cents of a second (1/25). Because of this, cinema images at a rate of 1/25 seconds per frame fool us into the perception of a moving image.*

[2] *"Silencing Many Hospital Alarms Leads To Better Health Care" by NPR, February 2014*

[3] *"Fountains as sound elements in the design of urban public walks soundscapes" by Fernando J. Elizondo Garza, Adrian Garcia Mederez, Cesar Guerra Torres, Diego F. Ledezma-Ramirez / Nuevo León State University, Mexico, 2016 "Silence resulting from the cessation of movement signals danger"*

[4] *Ana G. Pereira, Andreia Cruz, Susana Q. Lima and Marta A. Moita / Champalimaud Foundation, Lisbon, 2019*

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WE DON'T LIKE ABSOLUTE SILENCE. SILENCE TRIGGERS OUR BRAINS TO SWITCH TO ALERT MODE. SILENCE TRIGGERS PANIC.

Maybe you think you love silence. I know. But the type of silence you might like is around 30 decibels, which is a lot of sound. The silence of the mountains, a beach at sunset with a calm sea, that's the silence we like. If we were to be shut in an anechoic chamber, like the one in Minneapolis[5], for example, we would suffer from high anxiety, hearing our own heartbeat, then the blood in our veins and we would beg for someone to open the door.

When it's late at night, and our home goes quiet, our brain goes into alert mode, and any sound will create a significant disturbance.

This is when sound masking is needed.

Some of us can sleep in a long-haul flight because the sound of the engines masks most of the conversations of the 200 passengers on board.

Just as the sun masks the brightness of stars, the type of sound present in a water soundscape masks a lot of unwanted, noticeable sounds.

When designing sound for public spaces, adding the right sound to an already existing soundscape makes most people feel that the atmosphere is quieter.

Some space owners will argue that they will not use any sound in their venue because they like silence. But in reality, doing nothing could mean that what they expect to be a silent space will actually contain a lot of sound.

Other owners might require music, choosing the kind of music they like based on their personal preference, not the dynamics needed to create the right environment with sound. Keep in mind that most commercial music is meant for a primary degree of attention.

The craft of the sound designer is to understand the ambience, its challenges and threats, and transforming it by adding the right sound elements.

Dealing with soundscapes in a smart and respectful way will be, in my opinion, one of the most promising professional careers in the near future.

Sound and entertainment

Sound has always been linked to entertainment. Even in the early days of cinema, a piano player would help to convey the emotions to the audience.

Think of horror movies. They don't work without sound; we react to them jumping in our seats because of the way that sounds and silence manipulate us.

Just imagine 'Psycho'[6] or 'Jaws'[7] without sound or music. Not quite the same experience, is it?

In an old amusement park in Lisbon, there was a Horror Train that went through dark tunnels. An ambulance siren would sound in a bend making everyone shout in panic.

Evolutions in cinema are connected to the development of sound. At first only one, mono channel was used with a single speaker behind the screen but the sound was too thin. Disney's 1939 'Fantasia' was the first movie to be released in stereo using multichannel recording. The audience felt immersed in the orchestra.

There were also some quite interesting experiences like 'Sensurround' in 1974, playing a stereo recording with infrasonic subwoofers that made the room shake. The process was fittingly designed for the movie 'Earthquake'.

Then, Dolby brought the 5.1 format that remained a standard for many years. We had three front channels – left, center and right; then we had a pair of effects channels, left surround and right surround; and finally a low-frequency channel called the LFE channel. The audience could watch a movie surrounded by sound. The only limitation was that the surround channel had the same sound content distributed to the sides and the back of the theatre.

[5] *Orfield Labs Quiet Chamber in Minneapolis, Minnesota, U.S. was once known as the quietest room in the world.*
[6] *"Psycho", a film by Alfred Hitchcock, 1961*
[7] *"Jaws", a film by Steven Spielberg, 1975*

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This was not a problem because only non-diegetic[8] audio content would go to those channels.

In 2009, my team and I created some sound experiences for cinema, where spectators were invited to close their eyes and follow the story, which was told just with audio and only using ambience and sound effects. Dolby 5.1 was a huge limitation. Only 6% of the power goes to the surround channels, so it was challenging to spread the experience around the audience. In addition, despite the message 'Close your eyes' on the screen, humans don't enjoy having to close their eyes for long periods of time. As a result, everybody, in general, opened their eyes after 30 seconds.

However, those experiences were still a big hit in my home country, Portugal. Every feature film had a sound experience in the pre-show for several months.

Later, 3D pictures came into fashion. With a 3D picture, the sound fell behind, as it was too contained inside the screen. However, all efforts to move it a bit to the middle of the room were useless, because the sound that went to the sides also went to the back. Spectators sitting in the back rows experienced the sound coming from behind them, which is honestly pretty ridiculous.

Therefore, Dolby had to separate the side surround from the back surround. And thus Dolby 7.1 was born.

Digital cinema made it possible to accommodate multiple sound files in a DCP, so the door was opened to more immersive sound formats.

Experiments made in 11.1, 23.2 and more, lead to the revolutionary Dolby Atmos format. 128 channels of sound fully immersing the spectators!

However, this relates to cinema. We have to remember that a feature film is meant to be played in hundreds or even thousands of different rooms. So, there has to be a standard to ensure that everybody gets approximately the same sound.

When we talk about new screen experiences, they may take place as an experiment just once or for a limited number of times, and in a single location. In this situation, we have much more liberty to create a customised system that will fit our purpose. And this is where all the fun begins...!

One of the things that make an experience memorable is the surprise. When you're not ready for it, and something very unusual happens, it strikes you much harder than if you're sitting in a theatre expecting all of the usual voodoo we have been accustomed to in cinema.

The MINI Case Study (2014)[9]

One of the first cases I would like to share with you actually took place in a theatre at Motel X, the Lisbon horror film festival. MINI, the car manufacturer, who was the main sponsor of the event, asked us to create a sound experience that would frighten spectators.

We thought about it for a while, thinking that horror film fans must be difficult to frighten. Then we realised that everybody is already expecting the usual stuff coming from the screen, so we came up with an idea that would come outside the screen.

We said to the client: *'Let's kill someone in the room!'*

The idea was to have someone in the room talking on the phone and showing no respect for the spectators and have someone else kill him.

WE SAID TO THE CLIENT: 'LET'S KILL SOMEONE IN THE ROOM!'

[8] *Diegetic Sound is synced with anything that happens on the screen that is seen by the audience. Nondiegetic refers to the sounds that correspond to everything outside the screen: voice-over, music score or objects that have exited the screen.*

[9] *Produced in partnership with Normajean, Lisbon*

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To make this incident believable, we made full use of the venue's quality Dolby 7.1 system speakers. We recorded an actor receiving a fake call in our studios. He said 'Yes, I am at the movies but go on, you can talk'. Then he went on and on in a conversation with no respect whatsoever for the audience. We expected that the audience would try to shut him down, so, we directed him to be rude to the audience. After a minute, someone on the other side of the room – using a different sound channel, Back Surround Left – stood up and shouted: 'Just watch me shutting you up!' and then, everyone in the room heared several very loud shots from a shotgun.

After a short silence, the screen went black, and the MINI message displayed:

"IF USING YOUR PHONE IN THE MOVIES IS DANGEROUS, IMAGINE IT WHILE DRIVING" MINI

To implement this idea, we created a fake feature film beginning with a car driving on a winding road at night as the first main titles appeared. Everybody was focused on the movie, and the perspective was from inside the car, so it seemed like anything could happen at any moment. We placed the voice recording on the Back Surround Left channel and used the other surround channels to have some room noise and the killer on the right side.

Of course, when designing and presenting an experience like this, it was essential to create a setting that ensured no one would actually be harmed, or that the audience would not panic. Timing and slight exaggeration were important. Furthermore, this experience was created in 2014, at a time when the world was slightly different. Today, it is important to take into consideration the tragic events in Europe that have changed the general public's mindset and world view.

Before we let the audience into the theatre, we placed an infrared camera inside the room to film the spectators' reactions.

The channel placement in the cinema room - MINI Case Study

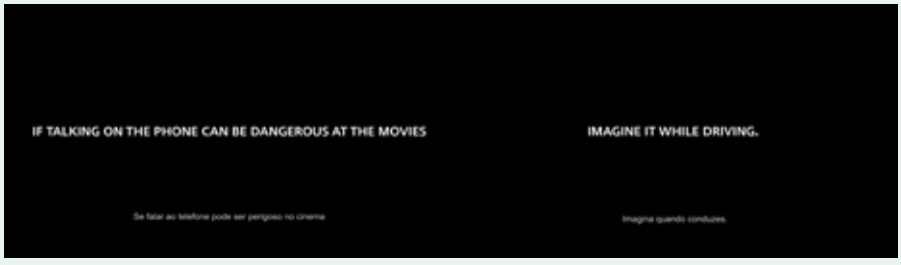
As we foresaw, the audience was crazy about 'the guy' talking loud in the theatre. Some rose up from their seats and told him to be quiet. Others were looking back at him. The shots stroke violently across the room and there was a big laugh and round of applause when MINI disclosed the message.

The Festival went on for three days, and we played this sound file in every session with the same result.

What gave this experience its strong impact on the audience was that it was surely not expected to happen.

For this kind of experience, the screen represents an obstacle, rather than a tool. The reason for this is that, when we watch a movie, everything is happening to the characters inside the screen with the audience looking outside-in on the action. Without a screen, the action is perceived as happening to the spectators themselves. The experience becomes personal.

FOR THIS KIND OF EXPERIENCE, THE SCREEN REPRESENTS AN OBSTACLE, RATHER THAN A TOOL.



The MINI case campaign message on the cinema screen.

A shot of the cinema audience taken with an infrared camera.

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The VW Polo Case Study (2016)

This sound experience was created for an underground metro station. Underground stations are fantastic for designing sound; they have a lot of reverberation, there are little visual clues, and the audience is replaced by a brand new group of people every 5 minutes.

Through research and preparations, I understood that passengers know that the train is coming by listening to its sound. A minute or so before the time, everybody looks at the dark tunnel and waits for the sound of the train.

At the time, VW was releasing their VW Polo GTI with 192 horsepower, so we created this sound experience to activate the brand's launch of their new car.

Our idea was to have a jet plane pass through the station using only sound.

We recorded the actual train sound and blended it with the sound of an Airbus, an F-18 and some other jet blast sounds. It had to be powerful. Finally, we recorded the car itself at full power and blended it in the very end of the experience.

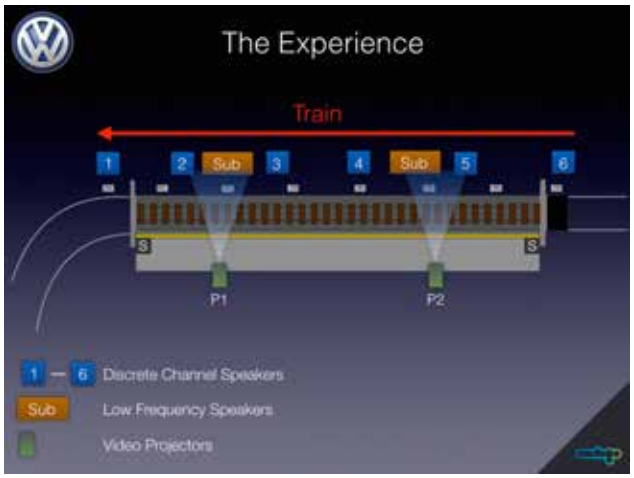
Setting up the experience

We placed a PA system along the rails the night before the experience.

The experience was a 5.1 channel with the sound of the train on the rightmost speaker inside the tunnel, then the travelling of the jet sound in front of the platform and, finally the car sound and horn on the leftmost one, inside the other end tunnel.

Our computer was placed in the platform cabin and the amplifiers and other equipment in a small warehouse in the middle of the station.

To connect everything, we then created a dedicated Wi-Fi circuit.



The airplane sound reached 110 dB at maximum peak, and the audience was overwhelmed by the experience. Some tried to run away, and others were just standing there, astonished. When the horn was heard inside the tunnel, two video projectors disclosed the experience: 'VW Polo GTI, 192 Horsepower'. Everybody laughed at the end.

We were at the site all day. We learned that early hours are not great for experiences because people are very sleepy and not open to anything. It worked better with young people and after lunch.

Two team members were watching the passengers. They had to suspend the experience twice because there were blind people on the platform. When you work in an environment that is populated by real, unprepared people, you yourself need to be prepared to adapt to occurrences and take immediate action.

The experience was recorded, and the video, too, was quite a success. You can watch it here: https://www.youtube.com/watch?v=5XfRonpxziE&t=11s

Sound is a very powerful tool. Used wisely, it can create amazing experiences. Managed poorly, it can ruin any idea. To make scenarios like the VW Polo and the MINI sound experiences work, it is necessary to think in not only the sound content, but also the sound space, and what will happen, when the audience is immersed in the experience.

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THE SOUND EXPERIENCE

Sound for virtual and themed realities

Digital has made just about anything possible, and we have witnessed a boom in the interest for immersive experiences, from collective rides on theme parks or themed experiences to individual immersion in Virtual Reality and Augmented Reality.

This has made the VR and AR industry grow rapidly. Great efforts have been made to immerse spectators in a 360° space but, at first, little was done concerning creating and designing sound for these spaces.

In the first experiments, you turned your head, and the video file rotated with you giving a 360° perspective, although the sound remained stereo and fixed. This lack of coordination created a cross-modal effect, which led to a conflict in our brain, giving the sensation that something was wrong – perceived as a fake construction.

As the evolution moved forward, some 360° videos found their way to Youtube or Facebook, so a significant change on these channels became necessary. Today, Youtube allows for 6-track audio files, and Facebook incorporates 8-track audio.

This means that we can create great sound experiences in First Order Ambisonics, for example, which takes 4 audio channels coded in a matrix that rotates with your head or with the mouse, in addition to a fixed stereo track for non-diegetic material like music or voice-over – which doesn't move as you rotate. What we hear is becoming increasingly synchronised to what we see in 360° environments.

However, let's leave the virtual world behind, and go outdoors into another kind of immersive reality.

There are considerable investments and efforts made for the development of sound for collective experiences. And theme parks are no exception as they have sound everywhere.

Themed entertainment provides a great opportunity for creative musicians and sound designers. There are no limits anymore, and everything comes together. A good, utterly immersive experience will have everything in place to deliver the maximum output in displays, graphics, motion, architecture, and multi-channel sound.

Thousands of musicians and sound designers work around the clock so that visitors are always immersed in sound. Hundreds of speakers are installed so that there is sound everywhere.

Great! Or...perhaps, it is not always such a great thing.

Is there someone thinking about the sound and its impact? I cannot help but wonder if anyone is worrying about the sound levels, the constant music stimulus, and its effect on visitors and staff.

IS ANYONE WORRYING ABOUT THE SOUND LEVELS, THE CONSTANT MUSIC STIMULUS, AND ITS EFFECT ON VISITORS AND STAFF?

Without putting anyone in particular on the spot, some theme park managers state: *'The louder the sound is, the more excited customers get!'*

Well, sorry, but this is not exactly true. We perceive loudness through comparison. Our hearing system adapts to the new higher level, and after a while, it will cease to consider it as being loud. It's the same that happens when we enter a place that smells bad. After a few minutes, we won't notice the smell anymore.

Other managers also argue: *'As long as the money is coming in, it means we're doing it right!'*

Well, again, sorry, but not exactly. After some time, constant loud sound and music will tire everyone. Many visitors will leave earlier, feeling drained, even without consciously connecting that sensation with the loud noise. I would argue that at the end of the day, less time spent means fewer bucks in the box.

As with everything in life, we need change and contrast. Someone who's talking all the time and on the same tone is boring.

With sound and music, the same happens: music is excellent and creates excitement and fun, but we should also have moments without music. Tempo and volume should also vary, so we have this wonderful sensation of energy when it goes up. Contrast is key.

For a successful sound experience, we also need to take into consideration the time each person is immersed in a particular soundscape. Passing by, visitors could be exposed to it for several seconds, but when queuing for a ride, they could be there for more than an hour.

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The staff will be in the same place eight hours a day, several days a week. The architecture of the soundscape must take this into account, and as a sound designer, you will need to create cycles long enough to avoid the perception of loops. Listening to continuous loops is a very unpleasant experience.

Once you've figured out what to do and after having implemented it, you need to test it. Ask questions and observe. Change what needs to be changed. From time to time, refresh the content. Some theme parks are more than twenty years old and still have the same music from day one. Many could do with an update.

The sound design for any themed space has a broader scope than the pure crafting of audio content. It should include the overall observation of the visitor's experience throughout the entire day, caring for their well-being and comfort.

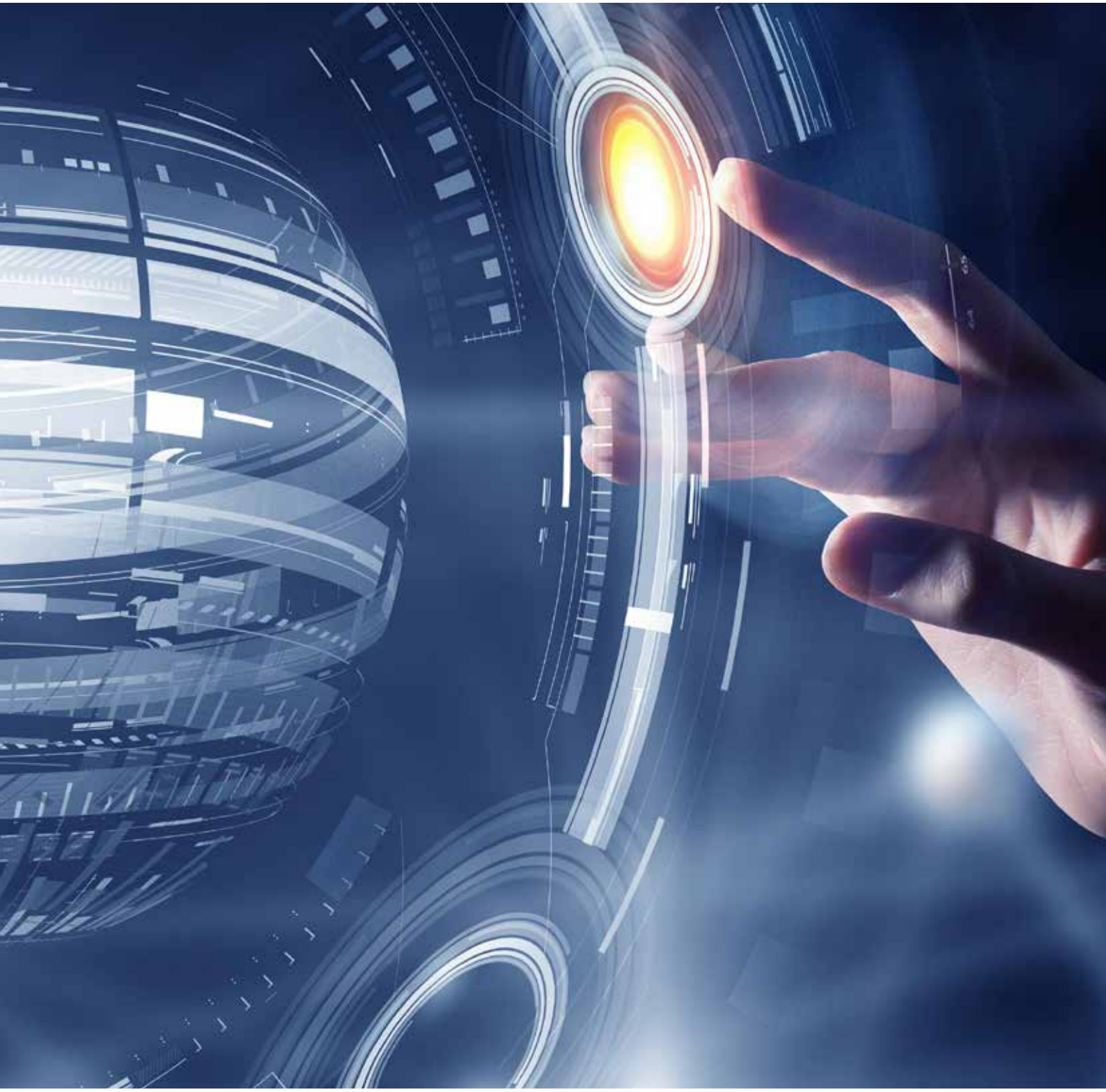
I urge you to remember this regardless of whether your space is virtual or physical. Maintain a balance between soft soundscapes and action sequences. Let's blow them away, all right, but let's also care about giving everybody space to recover and be ready for the next experience.

These needs and demands pave the way for a totally new craft: the sound coordinator or sound supervisor. This person will be highly skilled in sound design, sound reinforcement, but also in fields like psychoacoustics and sound architecture.

In my view, so far, nobody is doing this job. Someone should.

Gardaland Theme Park in Castelnuovo Del Garda, Italy. Photo by isaac74 on Adobe Stock

STORYTELLING BEYOND THE SCREEN



STORYTELLING BEYOND THE SCREEN

Photo by Sergey Nivens on Adobe Stock

Immersive Experiences

When we enter an immersive space, we leave the world behind for just a little while. That which surrounds us becomes more than walls or confinement, it becomes part of the narrative and the experience, as we go even deeper into this new land beyond the screen. We find ourselves in a wondrous place that literarily lets us live within the story ways that bridge reality and fantasy, as well as the virtual world with the physical world.

For the creator of a narrative experience, successfully immersing an audience is much more than projections on a surface, or speakers adding sound to a room. True, in-depth immersion is created form merging everything that is useful for designing a step-by-step experiential narrative that not only surrounds but allows the audience to become participators on the inside rather than spectators from the outside.

In the next chapters, the concept of immersion, space and telling stories that give space a voice is explored from the early constructs of organic, immersive spaces to the modern-day hybrids of spatial design and technology. The principles for doing so merges various disciplines as the context is elevated to be part of a stronger, deeper connection between content and audience applicable to many different uses. Leisure, cultural heritage, education, training, entertainment are just a few examples. For those who abide by the saying "Content Is King", this is your Kingdom, waiting for you to make it work as an integral part of your next creation.

DAVID JOHN TREE
ADAPTIVE NARRATIVES FOR IMMERSIVE SPACES

Adaptive Narratives For Immersive Spaces

In this chapter, we explore the concept of immersive spaces, investigating how the lessons of immersive physical spaces can influence the design of immersive digital worlds; VR, AR and XR are mere trans-dimensional portals into the digital metaverse. Through examples and case studies, I explore existing work in this area before focusing more deeply on future methods for the creation of immersive narrative.

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David is a Research Fellow and Technical Director of the Games and Visual Effects Research Lab at the University of Hertfordshire. He was initially trained as an Animator before gaining a Master's Degree in Games Art. He is currently undertaking a PhD in Creative Arts where he is investigating the application of author-driven computational narratives for immersive spaces. More recently he has worked on the Interreg North Sea Region Project, Create Converge, where he leads the development of immersive content prototypes in collaboration with subject specialists ranging from choreographers to quantum physicists to encourage interdisciplinary adoption of the technology.

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VR, AR AND XR ARE MERE TRANS-DIMENSIONAL PORTALS INTO THE DIGITAL METAVERSE.

For the first part of this chapter, we explore immersive spaces, before later exploring how these immersive spaces are being imbued with narrative elements and eventually investigating the future of integrated adaptive story worlds.

Immersion

Although originating from the act of physical submersion, the term immersion has developed to describe the act of becoming engulfed by a place or a thing, encapsulating the sensorium of the visitor transporting them to a time, a place, or even another world.

More recently, the term Immersion has become synonymous with eXtended Reality (XR) including Virtual Reality, Augmented Reality and Mixed Reality. These virtual worlds are accessed through the use of head-mounted displays, CAVEs and dome projection. However, beyond the sterile digital world of the bit and the byte, immersive spaces can be found in art installations, theme parks and even in manicured country estates.

These immersive physical spaces enable designers to create worlds which encapsulate and overwhelm the senses placing the visitor at the mercy of the designer's story world. Through the sensory stimulation of the visitor, an unquestionable reality is constructed, whether real or synthetic, suspending their disbelief and enabling true immersion.

Frequenters of immersive spaces are ascribed many different labels. For clarity and consistency throughout this chapter I use *visitor* in place of player, interactor, or viewer. The concept of a visitor supports the notion of immersive spaces being a place rather than merely a box or piece of software and thus allowing a greater understanding of what it means to be an immersive space.

The words *immersion* and *presence* are often used inter-changeably as they are closely related, however, the differential is that while the visitor can be immersed sensorially in the space, the feeling of presence or existing within a world is somewhat different. The feeling of presence predominates around the idea of agency, as without the world pushing back, how the visitor can know it is there, is questionable.

THE CONCEPT OF A VISITOR SUPPORTS THE NOTION OF IMMERSIVE SPACES BEING A PLACE RATHER THAN MERELY A BOX OR PIECE OF SOFTWARE.

Agency

Agency is broadly the ability to elicit control upon a world. However, often agency is misconstrued as the necessity for the visitor to have free will within the world as we have a true presence in the real world and yet do not have free will to act without consequence. Although more often used to analyse interaction with digital systems, we use agency here as a lens on immersive physical spaces.

In this chapter, agency is categorised into the following stake-holders:

Player / Visitor
Author / Architect
System / Nature

At extremes of agency where one stakeholder has too much control over the action of the world, other stakeholders release their control, destroying immersion. As a direct consequence of this, the objective is to create a balance of the visitor's ability to impact on their experience while maintaining authorial control to express their idea or concept and the system maintains the rules of the world.

[1] *For more information on Painshill park, one of the finest examples of landscape architecture visit Painshill park, Cobham, surrey, England - www.painshill.co.uk/*

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Real world immersive spaces

The grand gardens of stately homes are credited with the conception of landscape architecture in the mid-1700s[1] and can be considered some of the earliest examples of virtual spaces, as without the influence of humans, they would not have existed. Landscape architect Hon. Charles Hamilton created a series of microcosms immersing visitors in the cultures he visited while on the grand tour.

Although seemingly natural, these landscapes were achieved through spatial manipulation, strategic placement of planting and pathways and the redirection of nearby rivers. Using carefully constructed paths, Hamilton succeeds in guiding the visitor's gaze to his designed vistas, framing Foleys and transporting the visitor to an immersive oasis.

Further adding to the illusion, a curious fashion in the 18th century was the introduction of paid hermits, often a man hired by the landowner to inhabit a hermitage or folly constructed as part of a grand landscaping scheme. The hermit's job required the post holder to grow their beard, wear a costume, remain unwashed and of course, inhabit the provided hermitage. Beyond this ornamental purpose, the hermit in the garden could be considered an early form of what game designers would call a non-playing character, populating the virtual world.

Our second real-world case study of an immersive space is that of the theme park. These parks are a mutation of the amusement park, combining rides and attractions with thematic design to create a recreational space where visitors can fully immerse themselves in an imaginary world.

The key locations and sets are replicated and populated with actors playing famous roles; furthering the sensory encapsulation with the addition of thematic food and drink. An example of such a park is "The Wizarding World of Harry Potter" at Universal Orlando Resort[2]. Upon arrival, the visitors exchange real-world money into 'Wizard' money for use in the themed shops and stands of Diagon Alley. Park staff dressed in costume and the necessary infrastructure of the parks are garbed consistently in the story world of the characters with themed food stands. Integrated into the themed spaces are the rides and roller coasters themed to replicate experiences within the films allowing for park designers to guide visitors through environments.

RANDOM INTERNATIONAL, Rain Room, 2012. Exhibited at The Curve, Barbican, London. Courtesy of The Maxine and Stuart Frankel Foundation for Art. Photography by RANDOM INTERNATIONAL

Theme parks achieve one of the highest levels of immersion possible within the real world as they enable access to visual, auditory, olfactory, touch and taste providing a full sensory experience creating a real feeling of being immersed in the world only broken by the presence of other visitors.

THEME PARKS ACHIEVE ONE OF THE HIGHEST LEVELS OF IMMERSION POSSIBLE WITHIN THE REAL WORLD.

In 2012 Random International presented the immersive Rain Room at the Barbican Gallery[3]. Through a complicated system of valves motion detection software and much water, this immersive experience is anything but immersive as the visitor remains perfectly dry. The sensory immersion, however, stimulates a real sense of being in a rainstorm, providing the visitor with the sight, smell and sound of fresh rain.

[2] *The Wizarding world of Harry Potter at Universal Orlando Resort - A brief introduction to the park - www.youtube.com/watch?v=xfjuBaWTLO4 www.universalorlando.com/webcontent/en/us/universal-orlando-resort/the-wizarding-world-of-harry-potter/hub*

[3] *Artist Random International homepage and video of the Rain room experience.https://www.random-international.com/rain-room-2012*

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The removal of the touch stimuli, in this case, is the curiosity as this is a physical world experience that simulates the experience of being in a virtual world. Although this space does not have a narrative what it does, it demonstrates how even with the removal of a sense, immersion is still achieved.

Features of immersive spaces

Following on from studying these examples, we can extract the following elements integral to immersive spaces:

Common to both the landscape and theme park example are the creation of landscapes which control the visitor's viewpoint and movement through space. Control over movement can be commanded either implicitly such as in the garden with the use of slopes, paths or gaps in planting or more explicitly with the use of mazes, labyrinths and other spatial structures as found in theme parks and shopping malls. Although the methods differ, the objective is consistently in order to coerce the visitor to experience elements in the designed order or time frame. The key is whether using implicit or explicit manipulation, it should be designed in such a way as to avoid the visitor becoming aware that they are being manipulated.

The second feature necessary to immersive spaces is continuity, where the props, characters, currency, soundscape all synchronously support the world being created. Best exemplified in physical form by theme parks. Key here is not to permit any alien elements which could remind the visitor that they are not really in the story world. Leading to the adage of game design of 'do not let them see the edge of the world'. To create the feeling of immersion it is not only the replacement of stimulus to the sensorium but also the continuity with which it is replaced, consider a haunted house without the synchronicity of the sound, lighting and olfactory effects the immersive effect would be significantly diminished. Therefore, instead of seeing the senses independently, we should instead consider them to be a layered construct, with the order of influence sight, sound, touch, smell, taste.

As initiated by the hermits in the garden, populating worlds with characters serves multiple purposes, not only do they add much-needed background action and through inhabitation make the world feel alive but they also provide an opportunity for the author to express the nuances of the narrative. This is not to say that the story world must be inhabited for as much as characters add life to a world, should the opposite effect be desired then an absence of characters is as telling as their presence. However, for more effect should the author wish to create a feeling of eerie desolation then the past inhabitation of characters is needed to encourage the visitor to ask the question of 'what happened here?'.

Through the introduction of provenance, the author provides the visitor with a contextual lens from which to view the world and so what happened before can become as important as what is happening now. This lived in aesthetic is one that is increasingly used to provide an imaginary world with a feeling of presence, in the garden example this history is expressed in the ruined gothic folly which was constructed in its ruined state, this is also the case in the mock Tudor street of the theme park.

THE AUTHOR PROVIDES THE VISITOR WITH A CONTEXTUAL LENS FROM WHICH TO VIEW THE WORLD AND SO WHAT HAPPENED BEFORE CAN BECOME AS IMPORTANT AS WHAT IS HAPPENING NOW.

For the final element of immersion, we refer back to the initial definition, to immerse the senses. In an ideal world, the visitor would be able to see, hear, smell, touch and taste the immersive world and until Brain-Computer Interfaces become sufficiently developed will be far more achievable within the physical space. However, the good news is that for an immersive experience, we do not necessarily need all senses only that the senses provide a congruous result. Current approaches focus on sensory continuity between, sight, proprioception and sound, which provide enough sensory input to achieve the feeling of being somewhere so long as the visitor does not reach out and touch the world. Referring to the art installation presented previously, when the sense of touch is removed, we can see where breaking this continuity generates an otherworldly feeling.

Challenges of immersive digital worlds

When designing immersive digital worlds content creators should be careful not to fall into pre-existing tropes of game design, although most XR experiences are build atop game middleware the visual and interactive language of immersive worlds differs. To help avoid these pitfalls, we now consider the areas to be avoided when designing immersive experiences.

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A common trope used to inject a backstory or provide narrative elements within gameplay is that of the pre-rendered or on-track cinematic, where a visitor's control is deprived, and they are forced to watch a pre-choreographed piece which explains a vital element of the story. Now I am not making the argument for removing these narrative elements entirely. Instead, I am suggesting that consideration must be paid to how they are presented to the visitor who is wearing a Head Mounted Display (HMD). If the developer disables the viewer's ability to control the camera viewpoint, this removal of visitor location Agency may lead to cybersickness, which in turn leads to a less enjoyable experience. Instead, we should design worlds where the visitor can still move around while the cinematic elements play.

WE SHOULD DESIGN WORLDS WHERE THE VISITOR CAN STILL MOVE AROUND WHILE THE CINEMATIC ELEMENTS PLAY.

Translocation within the game world as with all elements should consider the rules of the world, the use of teleportation within VR experiences has become a common method for moving the visitor around the world while avoiding sensory dysphasia; however, these systems should be used in a sensitive nature to the world's narrative. If the world includes magic systems, then a magical translocation would be more immersive than a high-tech transporter which would be more appropriate to the science fiction genre.

Earlier we alluded to the concept of visitor Agency being an essential component of immersion. Further exploring this, visitor Agency can be broken down into a causal Agency where the actions of the visitor have reactions in the world and location Agency where the visitor has control over their viewpoint. In general, location Agency should not be limited other than through the use of appropriate world devices. For example, designers might place a locked door in the path of the visitor or create a window to frame an intended viewpoint but at no point should we disable the gyroscopic control of the HMD to force a particular perspective, but rather use physiological methods to control the user's viewpoint.

Key to the visitor's immersion within the world is the use of logical and consistent rules, without consistency, the visitor does not know how to behave or the possible effect of their actions. The effect of inconsistency would be the inability to develop a technique to overcome the game, negatively impacting on their causal Agency.

While the focus of this chapter is not on the technical aspects of XR production, it is essential to note that in addition to the considerations of designing a seamless, immersive experience the designer must consider the following technical obligations: to ensure comfortable latency between the virtual and the real world the frame rate of the immersive experience should be handled carefully ensuring a consistently high rate.

Moreover, for the avoidance of breaking the immersion rule of seeing the edge of the world the configuration of collisions on objects should be done carefully and avoid the possibility of intersection with the visitor. Both these challenges pertain to the disconnect between the perceived virtual body and the physical body.

Designing immersive worlds

Now that we have discussed the prerequisites of immersion and explained the possible pitfalls, I suggest the following workflow for designing these spaces. Remember here that we are trying to achieve a combination of game level interaction with in-depth narratives. This technique is built upon the techniques for designing story worlds for tabletop roleplaying games such as "Dungeons and Dragons". The purpose is to build a sufficiently detailed story world that the game could ask any question of it and have a logical and consistent response.

The advantage of taking a two-phase approach to these immersive spaces is that during the world-building phase we design the landscapes, factions and rules of the world which provides a solid foundation for the generation of game-world specific narratives, whether through automation or manual creation. This level of continuity that imbued into the world ensures that when experiencing these worlds, the visitor never 'sees the cracks' and receives an experience which transports them from the mundane to the fantastical.

THE VISITOR NEVER 'SEES THE CRACKS' AND RECEIVES AN EXPERIENCE WHICH TRANSPORTS THEM FROM THE MUNDANE TO THE FANTASTICAL.

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The three main elements of creating the story world are Rules, Races and External Forces. These can be aligned to the differing Agency levels discussed previously:

Rules, External Forces – System Agency
Races, External Forces – Authorial Agency

The Rules are the structure for applying system Agency on the actors of the world, these are fundamental and define traits of our world such as this world has gravity, the world has a bright star that provides light for half of a cycle, and there is liquid water. Weather changes the world at differing intervals and can make the outside world inhospitable.

The aces, provide for interest, diversity and create contrast in the world. These might be aliens and humans, or they may be characters from different nations, the important thing is that the races have traits that differ to provide a point of exploration for our visitor. In traditional fantasy games, there might be the erudite elven races, thuggish orcs and the humans stuck in between. A point of note here is that the development of the race's element is the most extensive element of this process and developing a detailed race profile here with history and traits will lead to a better developed adaptive story later on.

The role of External Forces is an oft-contested area; is there a necessity for deities in the story world? The reason I include them here is although it is not necessary to have an external forces layer to the world it adds both a mechanic for controlling the pacing of the game and can act as a catalyst for change if the story world gets stuck in mediocrity.

Interactive storytelling

Screen-based storytelling has long been dominated by linear storytelling, whether film or television, predominantly due to the non-interactive nature of screen-based media. A linear approach also applies to the medium of video games as until recently the capacity of interactive systems have required the game worlds and characters to follow a pre-determined series of events, due to the limitations of the systems driving these experiences.

The advantages of these linear forms of storytelling are the finite authorial control over how the story is conveyed to the audience. Especially in film and television the director has control of both the actors, the world, and the viewpoint in which we view it. With the introduction of 3D video game technology, the director loses control over the viewport, although they might be able to control the world and the Non-Playing Characters.

This, however, leaves little room for the visitor of our immersive digital spaces to have any meaningful causal effect over the world and although some games have attempted to apply systems of affinity where players actions change the way in that the game world reacts they are still relatively high-level systems with little impact on the greater narrative. Often employing tropes such as the escort mission where the visitor is required to protect or follow a pre-programmed Non Playing Character around the game world to lead the visitor to the next plot point. However, these introduce a new opportunity to fracture the immersion, what If the escorted character dies? The game over screen appears the visitor is transported back to before they died with a note of "try again!". Breaking our presence as it defies the game world rules in that if someone is dead, they would generally remain so, but the system would argue that it needs that character alive to fulfil a later plot point. What if instead of sending us back to the beginning of the mission the game just proverbially shrugged its shoulders and continued, replacing the character with a new one to fulfil the plot or eradicating that branch.

Through designing the game world, the Rules, Races and External Forces, we can then begin to consider what stories the author wants to tell, and which actors need to be involved in that story. To enable these narratives to take form within open worlds the story events should be considered more like a convergence of characters, external forces and a catalyst, to take an example from the Tolkien's epic Lord of the Rings when Frodo and Sam are instructed to meet Gandalf at the Prancing Pony inn. The story would have ended when Gandalf did not arrive if not for Strider's intervention in saving them and redirecting the hobbits to Rivendell. Previously we mentioned taking care when manipulating players, in this case, explicit manipulation was in keeping with the storyworld and expressed not only the vulnerable nature of the hobbits but established Strider as a friend and protector, therefore maintaining presence. As this interaction was in keeping with the story, the presence of the hobbits within the world would not have broken.

With the detailed storyworld to fall back upon, it is possible to extrapolate the external forces at play, with the final stage of generating the critical plot points in the story world. These plot events need not be in specific locations so long as the criteria of all necessary actors being in the local and the necessary external forces being in play. At this point in the process, a world has been designed, the rules, races and external forces are specified, and the major story events have been developed, which leaves us at the final point of how to add the interactive element to the story while maintaining presence. As indicated in the previous section traditionally these would be created manually with

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careful consideration paid to the techniques for generating and converging plotlines and characters. However, this is less than ideal when we consider the visitor's Agency. So how do we solve this, obviously it would not be possible for an author to sit waiting for each visitor to interact with the world to re-write the story. Alternatively, would it? Although current approaches focus on the manual creation of each story element, fields in artificial intelligence design are becoming increasingly relevant not as sole generators but instead as assistants in mixed-initiative design. These AI systems might soon fill the gaps between story events plotted by the human author, allowing the story to be told as intended, at the resolution needed while maintaining the balance of Agency necessary to allow visitors to feel truly present in an immersive world.

AI SYSTEMS MIGHT SOON FILL THE GAPS BETWEEN STORY EVENTS PLOTTED BY THE HUMAN AUTHOR.

Mixed-initiative design

To build a world on one's own would be more than a lifetime's work if to only create a quick snapshot on the level of the macroscopic. Developments of mixed-initiative systems for the generation of three-dimensional visual content are already profoundly understood through the field of Procedural content generation. However, the area of adaptive story creation for immersive spaces is a nouveau field of exploration which promises to imbue these visually rich environments with the necessary meta-narratives to fulfil the visitor's lust for presence.

Central to the success of long-form narrative content inside the immersive media space is the creation and maintenance of presence in the virtual world. The prominent starting place for adaptive storytelling is to build upon the games engines as they operate in the same 3D world and encounter some of the same challenges. However, a new language for this medium is needed as the tropes and techniques of directing players are incompatible with the requirements of presence.

A NEW LANGUAGE FOR THIS MEDIUM IS NEEDED AS THE TROPES AND TECHNIQUES OF DIRECTING PLAYERS ARE INCOMPATIBLE WITH THE REQUIREMENTS OF PRESENCE.

The field of computational narratives has been the preserve of computer scientists since the early 1970s, seeing significant improvements in recent years with the increasing availability of suitably powerful desktop computer hardware and readily available of cloud computing services. The objective of computational narratives is to gain a greater conceptual understanding of narratives, imbuing computers with a narrative intelligence to enable better human-computer interaction. Humans are naturally creatures of narrative, passing information on through stories, tales and limericks, computers do not yet possess this ability to express information in a consistent narrative.

Computational Narrative research is divided into two distinct areas, that of narrative analysis which seeks to extract the narrative from the text and build a model of understanding and Generative Narrative systems which create new stories based on human-generated narrative models. Although combining these areas is being investigated, there Is currently no end to end solution which can analyse a series of texts and then generate a new text that is unidentifiable from the style of the original.

To create congruent story worlds which maintain presence and immersion regardless of the action of the player computational narratives will become central to the generation of adaptive story worlds – allowing for the combined Agency of decision making with effective reaction from the story world.

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Framing the world

Once the world has been designed and the story written, the next step is to consider the framing. When going swimming, one does not jump straight into cold water. Instead, lowering oneself into the pool gently, testing the water and gradually exchanging environments from our surrounding of air to being submerged. Experience creators have begun exploring how the transitional space between the physical and the virtual can change the framing of the experience. An example of one such creator is Brighton based artist Simon Wilkinson of Circa69 who is exploring how the creation of a real-world lead up to his virtual experiences can blur the lines between the physical and the virtual.

An example is of a piece named 'And The Birds Fell From The Sky'[4] which focussed on the return to the physical world. The virtual element of the experience involves a Faruk clown character pursuing the visitor, following the visitor around with their eventual escape. After visiting the immersive space through the VR headset, audience members are then secretly marked by the assisting team before saying their goodbyes. Unaware of these surreptitious tags the audience members return to the real world thinking the experience is over, however unaware that actors dressed in the same clown costume have been placed throughout the local vicinity to continue to follow those tagged. The piece intended to blur the lines between the virtual and the physical, encouraging the visitors to question whether they ever left the experience.

THE PIECE INTENDED TO BLUR THE LINES BETWEEN THE VIRTUAL AND THE PHYSICAL, ENCOURAGING THE VISITORS TO QUESTION WHETHER THEY EVER LEFT THE EXPERIENCE.

[4] *Wilkinson, S. and Mercuriali, S.: 'AND THE BIRDS FELL FROM THE SKY' (2010)*

The History Of Interactive Storytelling

Regardless of the prevalence of linear storytelling in mainstream media, progress has been made by experimental creators who have been utilising increasingly powerful computer systems to produce immersive storytelling experiences. From the forerunner to modern-day Massively Multiplayer Online Roleplaying Games (MMORPGs) the Multi-User Dungeon games of the mid-1970s which provided the first glimpses into a computer-based exploration space where the player could explore a world, solving quests and discovering the narrative as the game progressed.

In parallel to these digital developments, Steve Jackson and Ian Livingstone produced a series of gamebooks entitled Fighting Fantasy[5], combining the game mechanics of tabletop roleplay with a narrative. Presenting the resultant text in the literary form and allowing the reader to make decisions along the way using numbered paragraphs and a character sheet to store the necessary variables.

Initial explorations of the late 1990s into the area of interactive fiction include that of the hypertext which utilised the new technology of interlinked webpages to enable a fluid interaction between the reader and the text. As internet speeds increased, the enrichment of web-based media allowed even more exceptional immersive experiences to be created.

In 2018 Netflix Originals produced the interactive film entitled Bandersnatch[6] as part of its dark futurism series Black mirror. Set in the 1980s, we follow a young protagonist on the path to becoming a game developer, inspired by a fictional book, not unlike the gamebooks discussed earlier. This protagonist goes through a series of events where the viewer can decide for him what to do next; interestingly in the meta sense, the protagonist does become aware of their controlled nature which breaks down the fourth wall creating an unexpected feeling of responsibility in the viewer.

DAVID JOHN TREE
ADAPTIVE NARRATIVES FOR IMMERSIVE SPACES

Photo by Joe Murray And The Birds Fell From The Sky 2010

The creators of Bandersnatch chose to ensure that the viewer explored every permutation of the storyline by using a game style checkpoint, where when the visitor chose to travel down the wrong path the story would come to an alternative ending and then send the visitor back to the point of decision. This technique, although ensuring the visitor sees the whole story does reduce the causal Agency, as the actions of the visitor do not lead to significant consequences.

Although a great deal of development is being undertaken in the procedural generation of world elements including meshes, textures, and the placement thereof, existing approaches still require a large amount of intervention from human operators to fill all the details of the world. An example is that of Red Dead Redemption 2[7], required the recording of over 10,000 individual audio clips to fulfil the narrative requirements.

The future

The Games and Visual effects Research Lab (G+VERL) at the University of Hertfordshire is currently researching the generation of computational narratives for use within immersive spaces. This research will provide us with a look at new ways to represent and synthesise congruent immersive story worlds while ensuring that human authors maintain authorial Agency over the world.

[5] *Jackson, S. and Livingstone, I.: The Warlock of Firetop Mountain (1982). Available at: www.amazon.co.uk/Warlock-Firetop-Mountain-Fighting-Gamebook/dp/1840463872/ref=oosr (Accessed: 25 May 2018)*

[6] *Slade, D.: Black Mirror: Bandersnatch, 2018 Netflix*

[7] *'Red Dead Redemption 2', 2018 Rockstar Games*

LISA O'NEILL
THE STORY BEYOND THE SCREEN

The Story Beyond the Screen

Why move beyond the screen?

Before we consider moving beyond the screen, it is essential to understand what a screen is and decide if we need to move beyond it. A screen can, of course, be defined by its technological specification, but when referring to a screen as a term, we are referring to a singular platform that displays content in a traditional sense. It is a tried and tested device that conveys a story to an audience in a familiar one-dimensional format.

LISA O'NEILL
THE STORY BEYOND THE SCREEN

ABOUT THE AUTHOR

Lisa O'Neill
Lisa is a company director of Centre Screen, a UK-based audio-visual software production company that specialises in producing digital content for the leisure heritage sector. Lisa works as a project director on a range of global projects, with a particular focus on largescale AVs, including theatre shows, immersive AVs, motions rides and 4D experiences. Lisa studied theatre, English and media at university, and worked initially on documentaries before starting to develop digital content for museums. She lives in London, and when not working or hanging out at museum exhibitions, can usually be found travelling, practicing yoga or running while listening to a podcast.

LISA O'NEILL
THE STORY BEYOND THE SCREEN

In some environments, the screen may provide the best platform to convey a story to its intended audience, and while it is tempting to suggest other options, first and foremost it is crucial to think about the story and how best to tell that story in the available space.

Moving away from the screen provides an opportunity to create an array of visual experiences, new ways of telling stories, at different scales and on a range of surfaces. These experiences can be big, bold and memorable, or pared down and poignant, but most importantly they are experiences that shift from the conventional and one-dimensional to create memorable moments, shared moments, giving audiences a unique opportunity to engage with a story in a way they wouldn't and couldn't in their everyday lives.

Our mindset, when developing digital content, uses what we know and have seen previously but should also draw on the exciting new possibilities open to us. Each story and its context is unique, and finding the best way to tell that story provides us with almost a magical ability or power to push the boundaries and continually find new ways to engage, inspire and excite. It also comes with a responsibility to tell the story in a way that remains true to the source material and the client's brief, and in a form that an audience with wide-ranging autobiographical needs and abilities can easily access, understand and enjoy.

OUR MINDSET, WHEN DEVELOPING DIGITAL CONTENT, USES WHAT WE KNOW AND HAVE SEEN PREVIOUSLY BUT SHOULD ALSO DRAW ON THE EXCITING NEW POSSIBILITIES OPEN TO US.

Projection and varying arrangements and scales of screens provide the opportunity to create a number of different types of AV experience. Projected digital content is being used more and more frequently in museums to replace traditional graphic panels, while immersive projection and large-scale theatre shows continue to use multiple projection and screen surfaces seamlessly blended together to create show-stopping shared experience. . . D-Day: Interception, Intelligence, Invasion an immersive AV at Bletchley Park which houses a 22-metre projection over a series of fractured screens is a good example of this. Individual pieces of content are shown simultaneously across the different surfaces to convey key intelligence aspects of the story. At other times, content is displayed across the whole surface to create single scenes of immersion.

www.centrescreen.co.uk/project-post/d-day-interception-intelligence-invasion/

https://bletchleypark.org.uk/whats-on/d-day-interception-intelligence-invasion

The primary point to consider when developing digital content for a space is not to think about what technology can be used in the space, but first of all to define the story that needs to be told, and then to consider how best to use the space supported by technology to tell that story. In our ever-changing digital world, it is easy to get excited and even overwhelmed by the technology choices available to us, but first we need to consider:

What is the story?

Who is my audience?

What is the best way to tell the story to engage with this audience?

Only then do we start to consider the space.

Spatial storytelling

An immersive space has no defined rules that it must abide by. It could be a planetarium-style dome show, a multi-screen experience, a projection-mapped room setup. Each is different, each is an experience, be it audio, visual or sensory.

AN IMMERSIVE SPACE HAS NO DEFINED RULES THAT IT MUST ABIDE BY.

A screen has a border, a frame to hold its content. The same could be said of a projection, for example, the type of projection used in a cinema. However, being creative in how we use projection can transform content from a traditionally defined and familiar display to a multi-sensory spectacle.

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THE STORY BEYOND THE SCREEN

Spatial considerations

How can I use the space I have available to bring the story to life?

How a space should or has been used previously can provide useful references, but when developing digital content it is also helpful to think about whether we want to break the concept of space through our storytelling.

Would the audience be more comfortable with a traditional use of the space and does that suit our narrative, or should the content be presented in a way that is unexpected and surprising?

Spatial questions to consider:

What are the possibilities and limitations of the space?
The size of the room, the height of the ceiling, and if it is a temporary or permanent display, all have implications on the technical design of the AV. It is useful to explore which technology options support the story and work from both practical and budget perspectives. It is also important to consider the audience viewing position for the AV—the space and budget may allow for a 360 wrap-around experience or a 10-metre 8K video wall, but is there also enough capacity for the audience to view comfortably?

What are the viewing options?
The creative approach to an AV experience and how best to physically display digital content can change dramatically depending on how the audience will view it. For example, the type of content, duration and depth of a story that can be conveyed when viewers are transitioning through a gallery space or corridor varies greatly in comparison with content developed for a seated theatre show. When developing the narrative, it is important to take into account how much content the audience can realistically digest in the available space and time.

WHEN DEVELOPING THE NARRATIVE, IT IS IMPORTANT TO TAKE INTO ACCOUNT HOW MUCH CONTENT THE AUDIENCE CAN REALISTICALLY DIGEST IN THE AVAILABLE SPACE AND TIME.

Who will use the space?

The number of audience members intended in a given space at any one time is also an important consideration, and the AV experience should be tailored to suit. If the intended viewing group doesn't work with the preferred AV display, it is useful to investigate how the approach could be adapted whilst still achieving the intended effect. For example, a single screen might work best from a story or budget perspective, but with a larger viewing group, a singular projection could work just as well to provide communal viewing, or multiple singular screens displaying the same content around a space could provide the same intimate experience simultaneously for larger numbers.

How can we ensure the way we use the space allows the audience to connect to our story?
It is helpful to consider the viewing options and/or limitations in line with the intended narrative and its emotional and engagement objectives.

- Should the audience be seated, standing, lying down or moving around the space?
- Will viewers dip in and out of the content, or will it be a pulsed experience?
- Is the intention for all visitors to have the opportunity to view the same content and have a similar shared experience or should the viewing angles be more visually fluid, allowing audience members to view different perspectives of the AV content?
- Is the space accessible for all and if not, can we offer an alternative or additional layer of interpretation?

All of these considerations affect how we develop the content.

After considering the space, when developing audiovisual software content, it is useful to apply 3 principles:

Illustration by Dan Lusby

Only once we have explored these areas can we begin to examine the specific technological options available and think about what approach will work best to bring the content to life.

LISA O'NEILL
THE STORY BEYOND THE SCREEN

What will work for my story?

Large-Scale AV
Large-scale AV provides an impressive digital canvas to showcase content. There are many options of how we can utilise a space to work for different types of content, narrative and audience outcomes.

Large-scale projection could be used as a platform to deliver high-energy, impactful stories that leave a lasting impression on the audience, or to create an ambient piece that provides a backdrop to a space. A multi-screen AV could be used to create an introductory film to a gallery within a museum or to display a promotional campaign within a retail environment. Pepper's ghost and holographic technologies allow us to challenge reality, while gesture technology allows users to create their own large-scale visual content.

The physical position of digital content within the space also impacts the storytelling and the audience's spatial journey. For example, a dome projection on the ceiling will achieve a varying audience reaction compared to a projection on a multi-user interactive table or the floor. Carefully mapping projection to the fabric of a building creates a completely different AV experience compared to a projection on a newly-created structure or surface.

The options of large-scale AV are almost endless, and it is our responsibility as digital content creators to define the best solution for our audience.

IT IS OUR RESPONSIBILITY AS DIGITAL CONTENT CREATORS TO DEFINE THE BEST SOLUTION FOR OUR AUDIENCE.

Immersion

Immersion could be a solution to enable the audience to be transported to a time or a place. Multiple projectors or screens working together in a specifically designed environment can make you believe in a story; the AV content can take you into that world.

It can also be used as a device to engage an audience when trying to cover what might be an ostensibly dry or complex story. For example, at the Parliamentary Education Centre in London, an immersive AV projected onto all 4 walls of the space is able to capture and sustain an audience's attention as it tells the story of UK parliament's history[1]. Detailed aspects of students' learning curricula are liberated from the constraints of textbooks and presented in striking, visually surprising ways that aid both comprehension and memory.

Immersion may also be used to provide the audience with the opportunity to experience something they cannot achieve in reality. For example at Stonehenge Visitor Centre, a 360-degree projected AV called Standing in the Stones provides visitors with the opportunity to experience how it feels to stand between the stones during different time periods and seasons of the year – an experience only made available through immersion, due to restrictions on the ancient archaeological site[2].

Immersion Techniques

Guiding the Audience - Considering the audience's digital journey around space and visually controlling the audience's viewpoint throughout the narrative can physically move an audience around a space in a way a linear on-screen story cannot. Immersing an audience with content is easy, immersing with a story is more difficult. Our story has an exposition, action and resolution, and so should the spatial journey we want our audience to embark on and experience.

OUR STORY HAS AN EXPOSITION, ACTION AND RESOLUTION, AND SO SHOULD THE SPATIAL JOURNEY WE WANT OUR AUDIENCE TO EMBARK ON AND EXPERIENCE.

[1] *https://www.centrescreen.co.uk/project-post/parliamentary-education-centre/*
https://www.parliament.uk/educationcentre
[2] *https://www.centrescreen.co.uk/project-post/stonehenge-visitor-centre/*
https://www.english-heritage.org.uk/visit/places/stonehenge/things-to-do/

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THE STORY BEYOND THE SCREEN

© The Postal Museum
Mail Rail at the Postal Museum

© UK Parliament Education Centre
Immersive AV at the Parliamentary Education Centre

With multiple, large-scale surfaces, sometimes there can be a tendency to create big, bold, fast-paced content all around the space. However, the human eye can only focus on one direction at a time, the brain can only process so much information in any given moment, and with this in mind, an immersive show needs to be carefully crafted to ensure the audience is guided on where and when to look. Key content should be presented in optimum vantage points, and at times could be duplicated around the space to emphasise key points and ensure clarity of the unfolding story.

Special Effects - When creating content, it is helpful to consider what else we can use to enhance the audience's experience and immerse them in the story. Are we making full use of the senses? Could we use lighting, motion, scent or physical effects to help convey the narrative?

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MINIMAL AV

It is important to remember that sometimes less is more and a subtle approach can be just as powerful as a large-scale immersive AV. A good example of this was the 'I am Ashurbanipal' temporary exhibition at the British Museum[3]. The exhibition explored the story of King Ashurbanipal's rule of ancient Assyria and features the British Museum's unparalleled collection of Assyrian treasures. One gallery covers the epic story of Ashurbanipal's victory at the Battle of Til Tuba. An initial reaction from a digital content creator could be to use large-scale impactful AV to demonstrate the battle.

However, in this instance, because the ancient stone reliefs that depict the battle were so compelling, projection mapping to highlight key scenes accompanied by an atmospheric soundtrack, was all that was needed to allow visitors to see, feel and remember.

Back to the Screen

As with all things in life, everything continues to move full circle, and as more unconventional forms of storytelling and spaces become the norm, we might ask ourselves *'Should we return to the screen?'*

Moving away from the physical singular screen represents a change in direction – moving away from the traditional and unexpected, moving beyond established boundaries and preconceptions of space. However, it is essential not to focus on the screen as a form of technology, but instead see it as our constant, our known, and when we are moving beyond the screen, really what we mean is we are always looking for new ways to tell stories.

WHEN WE ARE MOVING BEYOND THE SCREEN, REALLY WHAT WE MEAN IS WE ARE ALWAYS LOOKING FOR NEW WAYS TO TELL STORIES.

Our audiences are accustomed to seeing digital content conveyed in all formats and aspects of their lives from airports and work-places to leisure facilities and retail stores. This increased exposure and familiarity brings a higher level of critique and makes the challenge to create content that does something different ever more difficult. Increasingly, AV and interactive technology are becoming more combined as disciplines, as audiences are not only looking to move beyond the screen but also to become a part of it.

AUDIENCES ARE NOT ONLY LOOKING TO MOVE BEYOND THE SCREEN BUT ALSO TO BECOME A PART OF IT.

As technology continues to evolve, pixel counts increase and hardware becomes faster. There will always be countless options, but the key thing to remember will always remain the story – and how to convey that story to the intended audience. A filmed talking head displayed on a single screen relaying an emotional account of a moment in time could have just as much impact as a large scale immersive AV conveying the same event. A successful AV experience is one where the audience doesn't even think about the form of technology – they are simply enjoying a good story, as powerful storytelling will always transport them beyond the screen.

A SUCCESSFUL AV EXPERIENCE IS ONE WHERE THE AUDIENCE DOESN'T EVEN THINK ABOUT THE FORM OF TECHNOLOGY.

[3] *https://www.britishmuseum.org/about_us/past_exhibitions/2019/ashurbanipal.aspx*
https://www.centrescreen.co.uk/project-post/i-am-ashurbanipal-british-museum

STORYTELLING BEYOND THE SCREEN

STORYTELLING BEYOND THE SCREEN

Photo by sdecoret on Adobe Stock

Interactive Storytelling

Words are not just words, and narratives take many different forms: from an impactful sentence to an immersive story world with hundreds, if not thousands of narrative pathways. For the content creator and producer, the routes and styles to chose from are plentiful and continuously expanding.

Regardless of what route we choose to take, the story is the very core of creating great, story-based experiences irrespective of format and presentation. It does not matter if you are providing escapist fantasies, science fiction visions, or pushing a political agenda. If you do not present the audience with believable characters in relatable situations, the connection between your story or message and your audience will not happen.

The story is as important as ever, but we have arguably never seen it evolve this rapidly. As we move forward on our journey beyond the current relationship between creator, story and audience, we get to interact with the storyline itself. There are various means of doing so, from the point-and-click influencing of interactive videos with multiple outcomes to storylines and characters brought to life by Artificial Intelligence. What will the future of storytelling hold, and what will the role of the storyteller be in the future? Only time - or a clever piece of programming - will tell. The following chapters will give you an idea of the possibilities that are unfolding, and what may very well change careers, principles and disciplines, as the evolution moves forward.

Photo by Ilya Melnichenko on Unsplash

RADIM HLADIŠ
THE PAST, PRESENT AND FUTURE OF INTERACTIVE FILM

The Past, Present And Future Of Interactive Film

Let us begin our exploration of interactive storytelling with a little history. It's June 23, 1967, and we're in Montreal, Canada. It's Expo 67, and everyone's burning with anticipation just before the start of the film at the Czech Pavilion. Word has it that it's truly remarkable and people are willing to wait in line for more than three hours to see it. The movie theatre is packed as the feature "Kinoautomat" begins.

I will not leave you in suspense any longer about the significance of this event. Kinoautomat was probably the first interactive film ever in the world. It was created by a team of directors and writers led by Czechoslovak filmmaker Radúz Činčera. That's right; interactive video was being used as far back as 1967, predating the rise of digital interactive multimedia by decades.

RADIM HLADIŠ
THE PAST, PRESENT AND FUTURE OF INTERACTIVE FILM

ABOUT THE AUTHOR

Radim Hladiš
Radim Hladiš is an entrepreneur and marketing consultant based in Prague in the Czech Republic. In 2014, he founded Playou videos, a company that creates custommade videos for businesses around the world. Since then, his work has been highly focused on video communication, video production and the strategy of video campaigns. Radim believes that video is the most natural and authentic medium for communication that currently exists. This belief has guided his work, education and tech projects in the video industry.

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THE PAST, PRESENT AND FUTURE OF INTERACTIVE FILM

INTERACTIVE VIDEO WAS BEING USED AS FAR BACK AS 1967, PREDATING THE RISE OF DIGITAL INTERACTIVE MULTIMEDIA BY DECADES.

It was a revolutionary project at that time. The audience was allowed to choose the scene that ultimately determined the plot of the film. As the audience contemplated their choice, their guide for the screening, Czech actor Miroslav Horníček, explained the importance of their role and decision in what was about to happen next. They then voted using equipment set up for the task, and an assistant on the stage tallied up the votes before them. The film then continued according to the story chosen by the audience. What was also interesting is that the interactive film was made so that no matter how the audience voted, the ending was always the same.

The interactive presentation was a huge success. Paramount Pictures and Universal Studios showed great interest in it. Unfortunately, the Czechoslovak production team was banned by the Communist Party from spreading their work throughout the Western world. The project had no sooner taken off before it was grounded. As a result, the world did not discover it until an exhibition in Texas in 1968 and at Expo 74 in Spokane, Washington. The film also made its debut in Czechoslovakia in 1968. Because of Kinoautomat, an entire movie theatre was refurbished so that every seat was equipped with the voting system. It played several times a day for nearly three years before audiences finally tired of the story.

That was a long time ago. At the time of writing this, Netflix is following up the success of the Black Mirror anthology with an interactive version called Black Mirror Bandersnatch by the screenwriter Charlie Brooker and director David Slade. The principle of the story is essentially the same as Kinoautomat in 1967.

Of course, interactive film looks a little different nowadays. The voting takes place on a computer, tablet or smartphone. Today the audience is spread across the globe with numbers well into the millions. The interactive film itself is obviously much more sophisticated, and the ease of voting by a simple click means the process runs without any interruption. As might be expected, it's a very significant cinematic achievement, one that paves the way for new, interactive experiences.

Bandersnatch is neither the first nor will it certainly be the last interactive film of the new millennium. We live in a digital age, and the digital world buzzes with interactive films and videos. There are dozens of software platforms giving content producers relatively easy access to creating interactive videos.

BANDERSNATCH IS NEITHER THE FIRST NOR WILL IT CERTAINLY BE THE LAST INTERACTIVE FILM OF THE NEW MILLENNIUM.

Why are interactive movies successful?

We, the audience, want to be more than just passive consumers of content; we want to somehow get involved in it. We want to be part of the game because being part of the story means we get to experience more of the action. In addition, all the various applications for smartphones and PCs have made us used to click here and there, so we are used to influencing what's going on and have some input in the outcome.

We humans love to play games. We watch interactive videos and play them at the same time. The action is what we choose it to be, and it's exciting to influence and experience the effects of our choices.

To the producer and presenter of content, there is a further advantage. People will usually watch an "ordinary" movie probably only once (unless it captures your heart and soul), but they can watch an interactive video multiple times because the story can take different avenues each time thanks to the possibilities of our interaction. The ending changes with a click.

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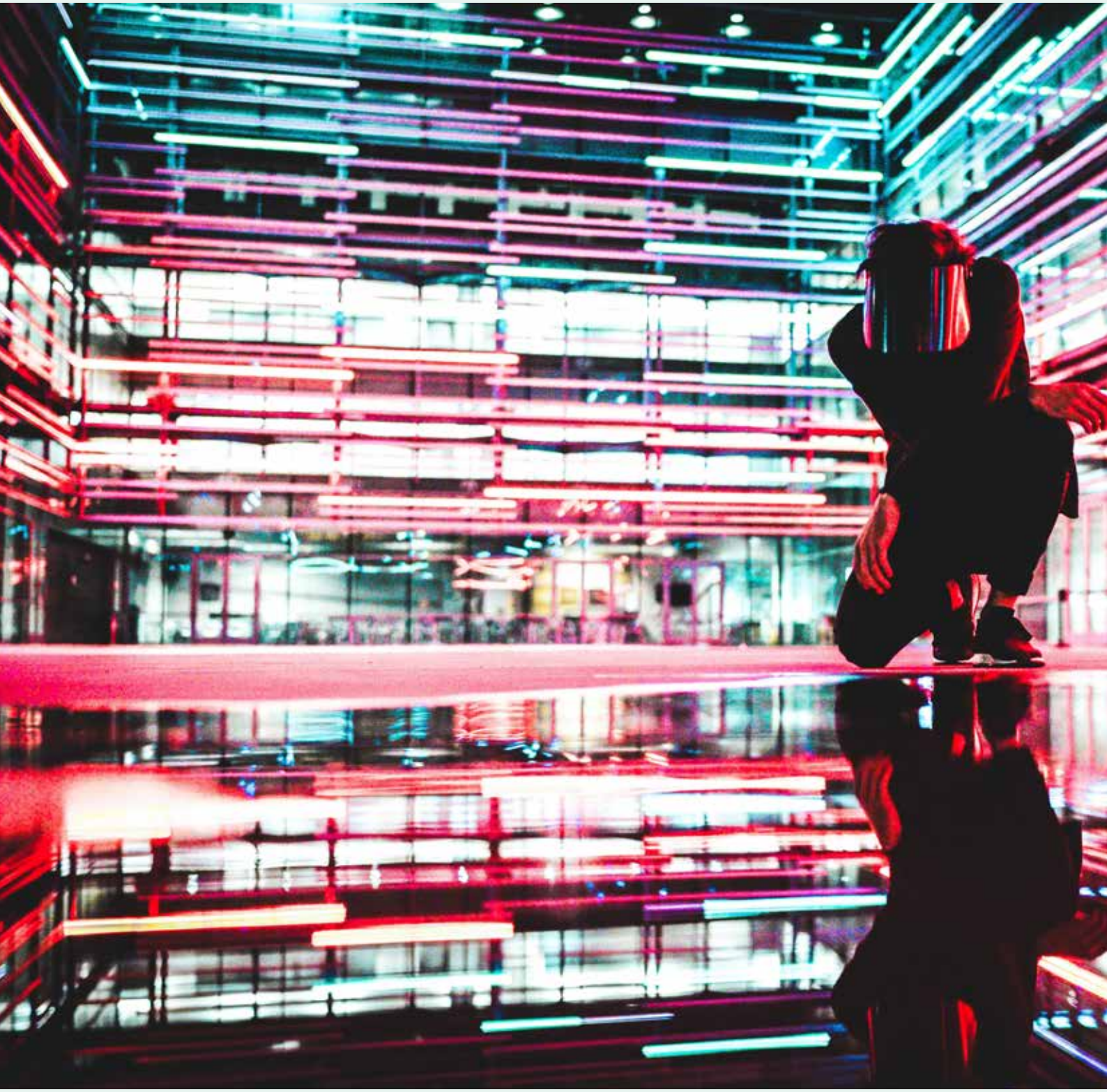

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THE PAST, PRESENT AND FUTURE OF INTERACTIVE FILM

Photo by Drew Graham on Unsplash

The use of interactive videos in the 21st century

Our century is The Digital Century. We are transferring more and more of our everyday interpersonal communication into and via the digital world. Interactive video may still be in its infancy, but high-quality technology and rapid development have already made it an integral part of the video industry.

The first interactive videos made their appearance in the educational field. Actually, the videos weren't completely interactive; rather, they were e-learning courses with videos, quizzes and tests. Interactive videos have a huge importance for quality education. Video courses contain options and test tools directly within the video. Educational materials, therefore, enable the systematic transfer and testing of knowledge. No doubt, interactive videos are a boon for the education sector and will develop the quickest there.

Another crucial area for interactive video is the film and entertainment industry. Interactive videos are, in a way, a combination of videos and games. I believe that the trend of interactive films will keep growing and become enriched with more interactive features, not just selecting the action, but also include interactive layers with additional content.

Or perhaps the new film experiences will be made by the audience themselves. Why not? In any case, interactive video will find its feet as a new entertainment format with substantial commercial potential.

PERHAPS THE NEW FILM EXPERIENCES WILL BE MADE BY THE AUDIENCE THEMSELVES

Interactive videos have already found a niche in marketing and e-commerce. For example, companies create interactive videos to use as guides for their websites. Because pop-up layers with additional content can be programmed into video players, it is also possible to sell goods using interactive videos. That way, the video is connected to the e-commerce system, and viewers can click on individual items in real time to put them into their shopping cart.

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Current technical features for interactive videos

There are currently dozens of platforms available to create interactive videos. Some are simple and some very robust. Let's take a look at the options and interactive features offered by these platforms.

Interactive Hotspots
A fundamental element of interactive videos is interactive "hot-spots"; areas in a video where viewers can click. These hotspots are embedded with programmed actions - i.e. jumping to another part of the video, starting another video or opening an overlay with additional content.

Branching Storylines
The basic functionality of the hotspot is the ability to make the plot of the story branch out in different directions. This means that viewers themselves decide the twists and turns of the film.

This decision is made while the video stops or repeats a scene in a loop, and the viewer is given a menu with options for selecting how the story will proceed. Once the viewer chooses, the movie resumes at the designated path and time chosen for moving forward in the video, then showing a different part of the footage.

In-Video Content
Another feature available by clicking on the hotspot is opening up more content within the video.

Extra content can be placed within the video, such as videos, websites with products and the option of purchasing them, informational material, questionnaires, forms, etc.

This way, the video can be enriched with more depth of content, with interactivity making it possible to add another dimension of use and engagement to the video.

In-Video Chapters and Menus
Some platforms for interactive videos also make it possible to create chapters and menus like on a website. In fact, you can completely replace a website using interactive video to create a richer experience for your online visitors.

System Integration
Interactive videos can be easily connected to various IT systems, such as websites, e-shops, CMS, CRM, and Internet advertising networks. They can be interconnected using various technologies like APIs, which are widely used today. By linking these systems, we open up vast possibilities for the commercial use of interactive videos such as video shopping, collecting user data, placing personalised ads within an interactive video, etc. Interactive videos can, therefore, be not only a means for storytelling but also a potentially very robust and powerful marketing tool.

Peeking into the future of interactive videos

Once the interactivity features are flawlessly implemented in the most prominent online video platforms, interactive videos are likely to take the world by storm.

While branching and story decisions may stay niche, buying a product straight out of a commercial will become a standard. Linking product placement to actual products in videos and movies will be as easy as pasting a link. Video descriptions will become history, as all the information will be easily accessible right inside the video.

INTERACTIVE VIDEOS ARE LIKELY TO TAKE THE WORLD BY STORM.

With the boom of smart devices and the rise of streaming platforms, the user adoption process will be fast and natural. Thanks to interactions, content creators and advertisers will be able to get more accurate feedback on their videos and campaigns, as their videos become a dialogue instead of a monologue nowadays.

What is clear is that interactive videos are bringing the worlds of applications and videos closer, potentially merging them further in the future.

We may see completely interactive personalised video-websites, that will treat each visitor differently and engage them with rich media content. Thanks to quick advancement in AI, we should expect to see real-time generated content based on viewer's decisions. Especially interactive educational content may bene-fit from this and become extremely valuable in the future, guiding each person individually through the course and answering their questions along the way.

Creating Interactive Videos

Creating Interactive Videos: Production
When creating an interactive film or video, the production team must proceed a little differently than what is customary. The scenarios are much more complicated because there are several of ir versions often overlap. This increased complexity finds its way into the work of the director and the entire production team. Programmers appear on the scene to work with the media players

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and program the interactive features. Everything must fit together beautifully to make sense. Since the audience is now part of the action, they must never become lost within it.

Creating Interactive Videos: Writing Screenplays
As you have probably already guessed, creating a screenplay for an interactive video is something of a creative, strategic and logical task. Work of this nature can almost be compared to playing chess. You have to think several moves ahead and have a specific idea about how the audience will react to different interactive elements. In a certain sense, the viewer of the interactive film or video becomes part of the screenplay and takes on the role of the screenwriter as well.

When creating a multifaceted plot with several story alternatives, it's practical to create a scheme of the action first, similar to the one prepared by filmmakers, i.e. the storyboard. However, the storyboard for an interactive video will contain a lot more information and look more like a diagram where the continuity has to balance logic and variations.

THE STORYBOARD FOR AN INTERACTIVE VIDEO WILL CONTAIN A LOT MORE INFORMATION AND LOOK MORE LIKE A DIAGRAM WHERE THE CONTINUITY HAS TO BALANCE LOGIC AND VARIATIONS.

The fundamental difference compared to traditional video script is the complexity of it. While traditional scripts follow a single storyline or plot, interactive films and videos may have multiple storylines, so-called branches, and even multiple endings.

While branching the storyline, the production time may easily rise exponentially. The creators must balance the amount of inter-activity and its actual impact, maintaining the illusion of choice but often leading several branches to the same outcome. Therefore creating a well-connected logical structure is critical.

Creating Interactive Videos: Producing and Editing
As mentioned earlier, producing an interactive video differs from conventional production by merely being more complex and sophisticated. Individual scenes and storylines must fit together and make sense as a whole. Therefore, the editing and post-production work of the video is naturally more difficult than in traditional video production.

Creating an interactive video may be compared to creating a video game. While traditionally each scene connects only to another, an interactive experience in one scene may be connected with several scenes. When creating such a scene, the director must be constantly aware of all the outcomes and focus on continuity in order to deliver a smooth experience no matter what scene may come next.

The same demanding approach applies to post-production. The transitions between the scenes have to look natural, and the scenes need to match perfectly.

Creating Interactive Videos: Interactive Features
Creating and implementing interactive features is part of the post-production work. In many cases, such as programming interactive layers, the work enters the field of information technology. It depends on what platform is used for creating the interactive features. Some platforms are more automated and can be operated by anyone while others require knowledge of programming languages like JavaScript.

Summary

Technology is constantly moving forward, and automation and artificial intelligence are pushing the boundaries of what is possible every day. The possibilities of interactive features will expand rapidly, engaging more and more people and involving them in the storylines.

One thing should not change, though.

Whether the current date is 1967, 2020 or 2050, the desire to share stories and engage viewers in the action will always be the same. In the past, present and future, storytelling has been, is and will continue to be one of the world's most beloved activities for creators and audiences alike.

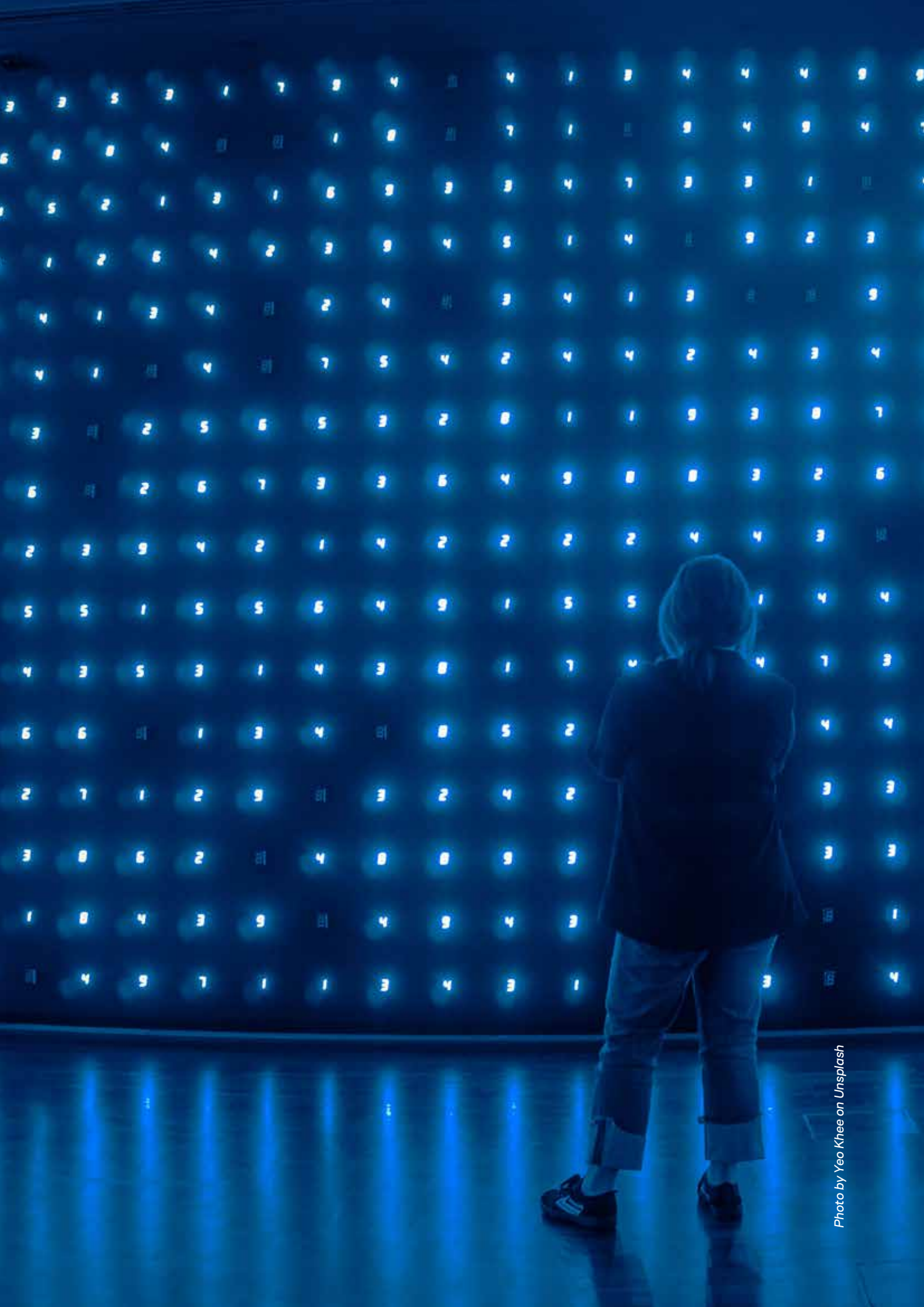

Photo by Yeo Khee on Unsplash

GUY GADNEY
STEPPING THROUGH THE SCREEN

Stepping Through The Screen

This chapter is intended to perform some magic. Much like the performer who appears on stage from nowhere, my goal here is to show how storytelling magic can be applied to traditional screen media by sprinkling the sparkles from digital media.

Like all good magic, the ideas and techniques in this chapter are not in themselves new. Interactive storytelling has been around for many years; indeed every new technological invention has been explored by storytellers in various shapes and forms. What I hope to present here, however, is a separation of the more gimmicky new ideas from those likely to have a more fundamental impact on the nature of storytelling itself, and how these can be used by storytellers to unlock new ways to tell stories.

Also like all good magic, the secret to the glamorous trick that the audience sees is most likely rooted in a more prosaic mechanism behind the scenes. In this instance, the mechanism that creates the magic is interactivity. The challenge to be addressed is how to apply interactivity to on-screen experiences so that audiences feel that they are in control of the story.

This is the magic.

In this chapter, I will present five tips for how this might be achieved. Each tip can be applied in isolation, or in combination. There are certainly more than five that exist, but the pages of this chapter are not infinite, and limits need to be drawn somewhere.

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Guy Gadney
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The evolution and effect of media technology

Media evolution has always accelerated in parallel with technology, and so naturally, we are currently seeing creative innovations that mirror those taking place in the internet and computing worlds. It might also be useful to provide a quick introduction to the scale of these creative changes. I would argue that we are at the more mature end of Amara's Law; 'We tend to overestimate the effect of a technology in the short run and underestimate the effect in the long run' [1], and that the various hype cycles of innovation that we have seen over the past two decades are now having seismic impacts on audience behaviour, and thus industry strategies.

THE VARIOUS HYPE CYCLES OF INNOVATION THAT WE HAVE SEEN OVER THE PAST TWO DECADES ARE NOW HAVING SEISMIC IMPACTS ON AUDIENCE BEHAVIOUR.

As indicators, the video games market in 2019 overtook the combined revenues of film and television[2]. And that revenue figure excluded mobile games. Within the linear entertainment world, Netflix in 2018 was rapidly catching up with Disney, FOX and Warner on its budget for original non-sport commissioning – $6.3bn versus an average $8bn across all three. In 2017, the football federation FIFA made $734 million in revenues[3]. In 2018, the FIFA video game made $800 million[4]. Digital advertising overtook combined TV and print media advertising in 2019 for the first time[5].

This does not mean that old media will be replaced by new media – video still hasn't killed the radio star – but it does mean that mainstream audiences are fluent in the language of interactivity, and are spending money on game-based entertainment. New SVoD platforms to rival Netflix allow for basic interactivity much like older PayTV platforms like Sky did in the late '90s. We are therefore in a quite unique position where audiences are becoming open to innovation and are consuming ever-increasing quantities of entertainment across multiple platforms. The opportunity to start going beyond the screen has never been more present!
The challenge in front of us is: how? We can easily be distracted by bright shiny innovations and always trying to stay ahead of the curve, but this creates a common danger where no products ever get completed as a constant stream of new feature ideas creep in. So this chapter aims to provide starting points to be somewhat of a guide to stay on the pathway and not stray towards the temptation of the new.

Interactivity is the starting point

The first tip is a simple foundation: start with interactivity, not with a linear storyline. In the tradition of Marshall McLuhan[6], this means that the message should match the medium. Throughout media history, it is commonplace for new story forms to build on previous models: film used theatrical storytelling structures, websites were clickable brochureware, apps were smaller versions of websites and so on. Yet the breakthrough successes are where the existing rules are discarded, and the story is told natively in its own medium. For screenwriters, this means thinking not just of tension, pace and characterisation, but of agency, game levels and immersion.

THE BREAKTHROUGH SUCCESSES ARE WHERE THE EXISTING RULES ARE DISCARDED, AND THE STORY IS TOLD NATIVELY IN ITS OWN MEDIUM.

In experiences where interactivity is layered on top of linear media, the audience agency is usually that the audience gets to choose what happens next from a limited list of options. Born from choose-your-own-adventure books, this model inspired countless DVD extra features and branching narrative projects including projects like Netflix's Bandersnatch. However, letting the audience

[1] *https://en.wikipedia.org/wiki/Roy_Amara#Amara's_law*
[2] *https://ukie.org.uk/news/2019/01/uk-games-market-now-larger-music-and-video-combined-according-era*
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[5] *https://www.emarketer.com/newsroom/index.php/us-digital-ad-spending-will-surpass-traditional-in-2019/*
[6] *https://web.mit.edu/allanmc/www/mcluhan.mediummessage.pdf*

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control the narrative in this way does not work. Much like PlayerCam on cable networks that allowed viewers to choose camera angles for sports matches, they create a promise of immersion, but instead, the audience's control is limited to controlling the story through a limited set of choices, far from given the ability to influence the story from within. PlayerCam features were great talking points but were rarely used, and branching narratives like Bandersnatch got a lot of press coverage but did not deliver the full agency that viewers wanted in the experience.

Charisma, Sherlock and The Suspect

To think of interactivity is more than just thinking about where a viewer can stop, start or redirect a story. It is about placing the viewer inside the story itself and making them feel like what they say matters. This approach was at the heart of the Charisma.ai platform – where the audience influences characters through conversations with them, and that in turn affects how the story evolves as a result. It is a subtle distinction between interactive narratives, where alternative stories are selected by audiences, and interactive characters are fluid and create lifelike and deeply engaging experiences.

Charisma itself was born out of a need to simplify the creation of complex interactive stories. I had worked on an interactive thriller called *The Suspect* which initially used IBM's Watson technology, but we soon found that writing a story on that platform was almost impossible. The story had to be created in multiple formats including Word, Excel, a mind-mapping software and then coded into the system in a process that slowed down production and burned through three writers who could not conceptualise the story's structure.

The story of *The Suspect* is a conversation with a potential serial killer who has done something unspeakable and will only talk to you. The idea behind it was that many real-life conversations are games: negotiation, flirting and interrogation. We wanted to make it feel like you were sitting directly opposite someone as dangerous, and charming, as Hannibal Lecter. The goal was to create a highly immersive experience that changed the way people thought about chat technologies, by overlaying well-crafted characters and a structured storyline. The idea itself was born out of earlier projects we had produced exploring emotional characters in lighter projects like Perfect Boyfriend and Perfect Girlfriend that launched in 2011 and where 8% of visitors engaged for over one hour, and some sessions lasted for up to six hours. We learned that there was an audience desire to engage with characters on more than a question-and-answer basis: they wanted to get to know the characters as friends and go on adventures with them.

At the same time, I was also producing the interactive narrative game for the BBC drama Sherlock which presented an episodic interactive storyline. The game – still available on the app stores as *Sherlock: The Network* – cast you as a member of Sherlock's gang, helping him to solve a mystery. The audience for the show is predominantly female and crime fans. The story had to be pitched at exactly the right intellectual level so that the fans felt the game elements made them feel smart for having solved it, and simultaneously not patronised by simplistic challenges. It also needed to play to the fans' love of the characters in the show. After all, it was Sherlock himself who invited you directly into his gang. As with *The Suspect,* having the audience step through the screen into the story was key to the immersion.

Charisma.ai draws on our experience of both direct interactive character dialogue and interactive storytelling. Its interface was designed for writers to balance interactivity with dialogue, gameplay and different levels of immersion. The more mechanical elements of the writing process are simplified using artificial intelligence and specifically natural language processing. This allows writers to focus on characterisation, story and the interactions that are the foundations from which to explore new forms of storytelling.

One step ahead of imagination

If all this is beginning to sound a bit infinite, then we can apply the second tip which is that, fortunately, we only need to stay one step ahead of the audience's imagination to make this work. Building an infinite set of options is not required, and indeed can be a distraction for audiences which ends up diluting the strength of the story. Ultimately, as I've said above, the viewer wants to feel like they have control, but that does not mean they have to have control, just that they feel like they have control. If the viewer is participating in a tense interrogation, for example, and they conversationally swerve left and start talking about fruit, the correct response should be a lifelike creative expletive, not a more technical 'I don't understand'. If the interactive platform you choose allows the fictional character to remember that you are a defocused interrogator and later brings this fact up in the story, then the story will stay that one step ahead.

THE VIEWER WANTS TO FEEL LIKE THEY HAVE CONTROL, BUT THAT DOES NOT MEAN THEY HAVE TO HAVE CONTROL.

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From a practical standpoint, this also reduces the budget and scale of your production. Bandersnatch required 315 hours of broadcast-ready video to be created, whereas projects *The Suspect* and *Sherlock:* The Network shot no more than ten minutes as the linear elements were woven seamlessly into fluid interactivity, rather than trying to be the interactivity.

Character as a crucial interactive element

The advantage of adding storyline to a character chat is, of course, that there is a consistent topic that develops as the story progresses. As well as adding tension and pace to the experience, it also adds practical and beneficial limitations that allow us to contain the infinite story. The plot itself and the context of the story can be used to create the limitations that support the approach mentioned above. If we are in a moment in the story where there is more action and a faster pace, then the level of interaction should be lower. If the story is at a more discursive point, where there is more focus on character development and exploration, then naturally this is the place for more interactivity where the audience can get to know the characters better, and build up more of a relationship with them before the story takes off again.

One of the ways to explain this in more detail is to look into tip number three, which is to focus your creative efforts on the story elements that work best for interactivity. If a story is made up of three pillars: characters, narrative and storyworld, the biggest bang for the emotional buck is to focus on character. Focusing on narrative is possible, but can easily run into conflicts between linear and non-linear screen mediums. Focusing on storyworld is good and very game-like, but is also expensive: think of the cost of building *Hogwarts* or *Grand Theft Auto*. This leaves character.

Putting a cute character in peril is always a good story: a proverbial puppy on the highway. We empathise with the puppy, worry about it, even shouting at the screen for it to get out of harm's way. The puppy is the centre of our emotional focus, not the highway.
If we were to break the fourth wall and have audiences step into the story, the highway would provide short-term adrenaline, but the puppy is the one with whom we want to build a relationship.

In recent years, the rise of natural language processing, chatbots, Skype and voice-driven smart speakers like Alexa have trained us to talk to our screens and expect a response. Shouting at the screen is no longer a one-way channel. The potential for these responses to be scripted as part of a story is compelling and should see the rise of a whole new genre of conversational entertainment.

But let's step away from the story and our characters for a moment, and for tip number four think about our audience. In this interactive experience, what role do they play? Should they be a character from within the existing story? Should they play a new character, created specifically for this purpose? Should they play themselves?

The Suspect - interactive thriller produced with The Project Factory.

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The role of the audience

Taking an example like NCIS, would it be better to play one of the lead characters, to play a new recruit to special agent commander Gibb's team, or to be you dropped into the NCIS world with no previous investigative experience?

In video games, you generally play an adopted character – either one pre-created or a customisable avatar with variable strengths and weaknesses. This would indicate the same might be applicable for interactive stories. However, in our world where the story is driven by your interactions with characters, the conversation can dry up pretty quickly if you do cannot hold your own as well as Gibbs. As well as this virtual credibility – where you need to be credible to an AI character – our experience has shown that if you play yourself, you become immersed in the story more deeply and more rapidly. You think like you, behave like you, and react like you. As a result, the experience feels more real because you are the person taking part.

IF YOU PLAY AS YOURSELF, YOU BECOME IMMERSED IN THE STORY MORE DEEPLY AND MORE RAPIDLY.

While some of these tips may seem futuristic, they are all being worked on in different combinations today – and some may argue have been for many years in less technologically elegant ways. The internet has given writers a new set of writing instruments to create new forms of stories and, as with every new medium beforehand, these instruments take time to master. However, the speed of innovation has never been faster due to the instant globalisation of ideas enabled by the connectivity of the internet. In the spirit of staying one step ahead of the wave, I offer one more tip.

So far, we have covered the changes that interactivity allows within a story. We have covered the impact on characters, on narrative, on storyworlds and on the audience. But there is one more area, an optional fifth tip, to think about. And this is the impact that new artificial intelligence methods will have on the overall story itself.

Stories that learn

AI can be simplified down to being computer code that learns. In this interactive world, the stories will to some degree be written in computer code. If that code is AI, then what does a story that learns look like?

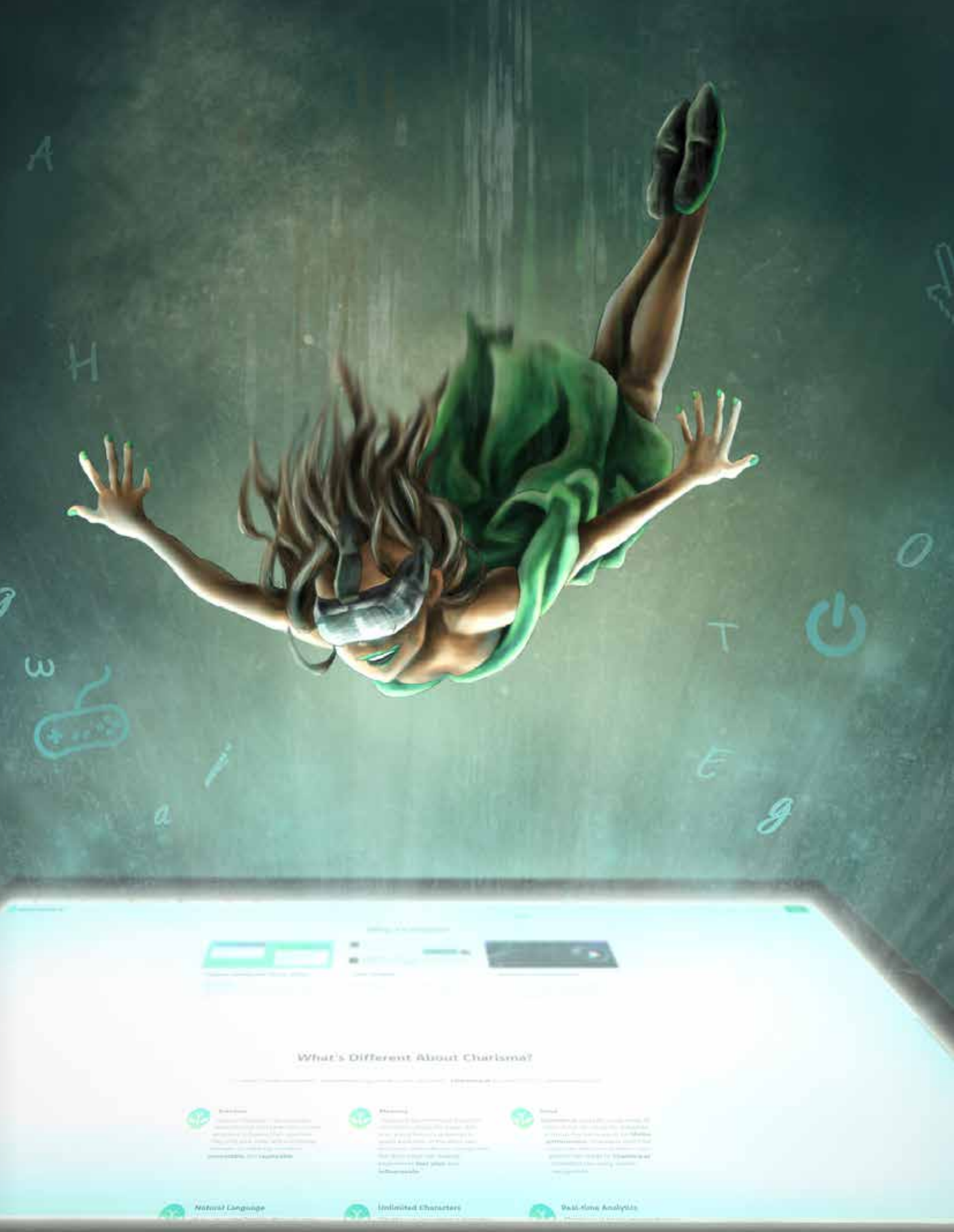
This a topic I am exploring currently as part of a Fellowship with the University of Bath in the UK[7], looking specifically at the moral and creative impacts of automation. The singular starting point in this work is the assumption that a story will never be finished because it can always evolve based on any number of influences: audience participant, virtual character evolution, time, real-world event and so on. An author will create the initial story, but from there it will grow and adapt as a child does from its parents. These new stories are Borgesian in concept – infinite, recursive, mirror-like and labyrinthine. They sound complex in description, but the technology already exists to allow authors to create these with comparative simplicity. Indeed the primary directive for the work we do on Charisma.ai is that it should be done with writers put first.

A STORY WILL NEVER BE FINISHED BECAUSE IT CAN ALWAYS EVOLVE.

So imagine a story which you experience on a Monday, then return to on a Thursday to find that it has subtly changed. Characters are happier because the sun is shining – in the real world, outside your window – and their happiness changes the plot. Other characters are upset because the audience has been disrespectful. That again influences the plot. And once the plot itself has finished, it can be replayed and will have changed purely based on how you played it the previous time. This is not like a book or movie that we watch and remains the same the next time we look at it. It is perhaps closer to a TV sitcom series where the location is the same, the characters are the same, but the events are different.

We are about to see a wave of innovation race through storytelling – providing new structures, genres and techniques that will bring these stories ever closer to their audiences, who will be ever more aware of the environment in which they are consumed. Like the travelling storytellers of old who would tailor their campfire stories to their audience and their surroundings, so new evolutions in technology are creating more fluid, interactive stories. These are stories that shift from being monologues by an author to being dialogues with the audience, and our screens will become playgrounds for the next generation of creators who are energised by the challenge and the opportunity that new technology toolkits afford them.

[7] *https://swctn.org.uk/automation/*



Charisma.ai is a high-end interactive story creation platform.

STORYTELLING BEYOND THE SCREEN

Photo Credit: VR Connect - 3 locations, one conference
Photo by Gorm Branderup

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Photo by Josh Hild from Pexels

Storytelling, content creation and media production are evolving beyond the point of being represented as a video or film on a screen. There is a new world awaiting creators and the audience when a step beyond our current understanding of the screen is taken.

Storytelling Beyond The Screen is the book for student and professional story and content creators who are about to challenge the way that the audience can experience the content that is being brought to life by new technologies and possibilities. It is about the new things happening right now or in the immediate future of the evolution of storytelling, but it also contains more. Here, a new mindset is presented as it is being applied to new virtual, physical and hybrid realities and the very design of narratives. It is the mindset of the future innovator, creator, designer and producer of story-based experiences.

In this anthology, experts from different countries and disciplines share their knowledge and experience on how to go beyond the screen as we know it in multiple ways. Here you will find insights on hybrid, virtual realities, soundscapes, design, immersive spaces, interactive storytelling and Ai, and furthermore, looks behind the curtain of some of the projects the authors have been personally involved with.

The authors and experts of this anthology are:

Klaus Sommer Paulsen
Integrated storytelling and experience design professional. Founder of AdventureLAB and board and committee member of the Themed Entertainment Association, IADAS, MMEx and others.

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Filmmaker and producer, specialised in cinematic virtual reality. Co-founder of MANND.

Maria Herholdt Engermann
Creative VR experience designer and producer. Co-founder of MANND.

Manuel Faria
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Co-founder of To Play For, the media technology company producing new forms of immersive stories powered by artificial intelligence.

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