There is Nothing Virtual About Immersion:
Narrative Immersion for VR and Other Interfaces

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Abstract

Immersive environments surround a participant such that everything they perceive is a part of a new world. Long before computers, new virtual and immersive worlds were created all the time by oral storytellers. Audiences still become immersed in story worlds, seeing the details, believing the actions, and making connections between the events in the story and their own lives. Therefore, in a virtual reality environment (VRE) that uses narrative, the participant is doubly immersed. Knowing more about how a participant is immersed in narrative would allow a VRE designer to work more efficiently. This paper discusses three attributes of narrative – time, context and participation – that contribute greatly to an audience's feeling immersion in a story. These elements also map well from oral storytelling to new media and VR applications.

Keywords: Narrative, immersion, storytelling, context

Introduction

Virtual reality environments (VRE), or immersive environments, are so called because the participant is sensually immersed or surrounded by computer-controlled media. In the early days of VR, a head-mounted display provided the participant with a cartoon-like world that wrapped around them visually. Accompanying sound was provided computationally, often adding a 3D sound-scape to the experience. Data gloves provided a connection between the computer and the participant's hand-eye coordination, allowing them to virtually grasp and manipulate objects in the environment.

Today the experience is much the same with advances in technology. While head-mounted displays are still used, now there are also walls such as the ALIVE space at the MIT Media Lab[1] and entire rooms with projected imagery responsive to the participant.[2] Instead of data gloves, visual tracking of body position and body parts is achieved through sophisticated real-time computer vision systems.[1] 3D spatial aural representations of the experience are in even greater use today – which is not surprising given the commercial success of surround sound

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[1] See http://alive.www.media.mit.edu/projects/alive/

[2] Such rooms are sometimes called *Caves*; surround-screen, surround-sound, projection-based VR systems. For more on Caves, see http://www.evl.uic.edu/pape/CAVE/

systems in the consumer audio market. In the chapter on immersion in her book *Hamlet on the Holodeck*, Janet Murray states,

> *We seed the same feeling from a psychologically immersive experience that we do from a plunge in the ocean or swimming pool: the sensation of being surrounded by a completely other reality, as different as water is from air, that takes over all of our attention, our whole perceptual apparatus.[2]*

When sights and sounds in a VRE are particularly well designed and coordinated, the mind follows the senses. Belief, or at least the suspension of some disbelief, follows what is sensed. If something can be seen, heard and manipulated, if not also felt, then it can be believed. Delivering the sights and sounds by immersive media can cause a strong visceral and cognitive belief in what is experienced. It is *belief* that puts the real into virtual reality.

Story & Telling

But this is nothing new. Storytellers have been providing this sort of believable immersive experience with stories since the beginning of humanity. The human animal is a narrative animal. In the canonical image of village people sitting around a fire at night, everybody is listening to the storyteller tell the tales of the day, the season or of the people themselves. For those storytellers and those audiences, there was nothing virtual about the tales told or the experience. The tales were about life itself – living it, surviving it and ending it; whether historically or metaphorically. We are the same today. When we look at examples of how narrative can immerse an audience in a story world, the tricky part for those designing electronic media for or around the story is to know how the audience is already immersed. How is the audience/participant already feeling about and identifying with the characters? How much has the audience allowed themselves to fall into and be lead by a familiar narrative structure? How likely is it that a particular audience personally identifies with the sequence of narrative events? Knowing the answers to these questions allows a designer to work more efficiently. For instance, it is unnecessary to design complex visual effects or scenery for a particular part of a VR experience if the audience/participant is already deeply engaged in the experience because of the nature of the narrative events.

By experiencing a good story well told, we create our own immersive environments, with details unrivaled by electronic media. We are able to see the anxiety in faces, we can hear the excitement in voices, we can smell the food in kitchens, we can feel the hairs on the back of our neck react to scary situations. Technological additions should complement the immersion already present in the human system. While modern electronic media like film and television can be quite immersive and compelling (which is why examples from these media are referenced below) the traditional art form of oral storytelling offers particularly clear examples of narrative immersion.

In oral storytelling, the storyteller knows the story, either word-for-word or mental image-for-image. The story is then filtered and seasoned through the life experiences and craftsmanship of the storyteller. Life experience provides texture to the story, while craftsmanship provides structure. When the storyteller combines personal experience and craftsmanship with their own immersion in the story they are telling, the audience is drawn in further, each individual in their own way. While one person's enchanted tower may not look exactly like someone else's, together the teller and audience create a very real immersive experience composed of many individual story world variations.

Volumes can be (and have) been written about narrative immersion in different forms. Narratology [3] provides language and tools for analysis of various aspects of narrative, including reader/viewer understanding and interpretation. In this paper only three attributes of narrative will be discussed, as these three contribute so greatly to immersion and map well from oral storytelling to new media and VR applications. The three narrative attributes to be discussed are *time*, *context* and *participation*. All three have critical roles in oral storytelling and provide valuable models for other forms of immersive narrative experiences.

Time

There are two widely accepted descriptions of time in narrative. As Metz [3] and other researchers [3,5] have discussed, there is a real-time experience encompassing the narrative experience, sometimes referred to as *presentation time*, and there is another time internal to the narrative experience. The first describes the period of the narrative; that is, the time during

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which one is in the movie theatre or the time during which one is participating in a VR experience. There is a direct and linear relationship to the clock in this aspect of time. It is the version of time that we experience in our lives on a day-by-day and minute-by-minute basis.

The second version, sometimes referred to as *narrative time*, describes the period(s) of time inside the narrative. Narrative time is often a very flexible and fluid treatment of time – an artist's conception of time. Its treatment and scale are completely dependent on the level of detail the storyteller needs to convey at any particular part of the story. To tell the story of a character's expedition through the Australian outback for instance, a real time treatment would be tedious to say the least, as well as unnecessary. Instead, telling the details just before, during, and after major events and constructing a sequence from that story material would be quicker to tell and more enjoyable to hear. Likewise, the moment a character thinks they are about to die – that moment when supposedly one's life flashes before their eyes – does not need to be only as long as the death-flash itself. Common literary and cinematic techniques like flashback and flash-forward allow a view into the connections and relevances between the details of the death-flash and the history of the character – using the flash as a springboard into the life of the character. In other words, what would be short moments can become long and detailed, while long periods of time can be made short and succinct (or nonexistent) for expediency.

Genette goes further to describe other aspects of the use of time in narrative, namely *order*, *frequency* and *duration*. Still, given just *presentation time* and *narrative time*, it is possible to see that we live in the first; when immersed in the story we travel to the second. To be immersed means to be engaged, not just physically but also mentally and perhaps also emotionally. To be engaged mentally means that the mind is an active participant in the narrative event, whether or not there is any physical indication of such engagement like body movements. The flexibility of narrative time provides the space (or rhythm) within which the participant's mind can be fully occupied. In a sense, narrative experiences (reading, listening, watching) are merely catalysts for a mental activity that we also call narrative.

There is a third aspect of time that is less of an attribute of narrative and more a reaction or response to narrative. When full narrative immersion happens (that is when someone is completely drawn into a story) very often time appears to slow and sometimes stop. When we are drawn into *narrative time* so completely that we lose track of *presentation time*, we are

immersed. This is a common enough experience. Most people have had the experience of loving a story, movie, play, or television show so much that the time seemed to fly by. While this is common, the effect is quite profound. It means being so immersed that the technology of the presentation: the television, the flickering light of the film projector, the speakers, computer screen and perhaps even the keyboard and mouse, disappear. It means that the awareness that one is surrounded by strangers in a darkened room, sitting in unfamiliar and perhaps even uncomfortable seats, is no longer there. And, most important, losing track of time means personal concerns and issues that may have been weighing heavily on one's mind before the story experience, have also disappeared. [3] For a period, the story world becomes *the* world, and when that happens, the time of the outside world seems to stop.

This type of immersive experience has always drawn people to good stories and good storytellers. For a few moments, we as audience can leave the cares of our time and put on the simpler cares and tailored joys of characters we have just met. I once sat in an audience of 300 strangers and listened to one of the great storytellers, Jay O'Callahan, tell his seventy-five minute story entitled *Pouring the Sun*.[4] I remember before the show being aware of the audience all around, many of them noisy, energetic young children whom I was concerned would be distracting during the performance. I remember the lights dimming and Jay O'Callahan walking onto an otherwise empty stage. I remember being aware of the first three minutes of the story. But my next awareness was not until the last couple minutes of the story. For seventy minutes my mind moved at the same rhythm as Jay's telling. And indeed, all 300 people, including the once noisy and energetic young children, were all quiet and still for those same seventy minutes. Or if they were not quiet, I was completely unaware of them as I was transported by the story to a Pennsylvania steel town.

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[3] I say this is most important because it has been one of the main attractions to entertainment media. We forget our cares and woes by losing ourselves in stories. The American film industry thrived during the years of the Great Depression before World War II, even though a very large percentage of the population was unemployed and hungry. The movies helped people dream of a better time.

[4] For more on Jay O'Callahan, see http://www.ocallahan.com/

Context & Space

Context is the space in which a story happens: setting of time and place, political and social conditions, individuals present, their goals and agendas, etc. And as with time, there is (at least) a *presentation context* and a *narrative context*. Presentation context is physical environment in which the narrative is experienced, while narrative context is the space related in the story. Unlike in the theatre, oral storytelling has no fourth wall. There is no artificial distance or barrier set between the storyteller and the story listeners. Both teller and audience are immersed together in a context of story. There is a sense of: *We are all in this together. We will go through this trial, this mystery, these deep, dark, woods together*. With the storyteller leading the expedition into narrative context, the audience builds trust with the teller, allowing the teller to lead them where they would not go on their own and trust that they will be lead back home safely.

Physical context is what VR systems have focused on the most over the years. The idea has been to have people believe they are physically someplace else by immersing their spatial orienting senses (sight and hearing) in another world. Presentation context is that space in which the story or VR experience happens. It is the cave, the special projection room, the location of the computer and large screen, or the building that provides the story. [6] discusses using a simple method of establishing narrative context as a model for context aware applications and devices. Narrative context describes the world in which the story takes place, which can (though not necessarily) be a very different sort of place than the presentation context.

Mitsubishi Electric Research Labs created a VRE in the mid 1990's called Diamond Park.[7] One of the goals of Diamond Park was to provide a distributed access VE, where, for instance, people in Japan could experience the same environment at the same time as people in the US. Both sides of the globe would be able to see and interact with each other. Large computer monitors were mounted on stationary bikes with special interface controls installed on the handlebars, allowing the rider to pedal through the virtual park and interact with the environment's characters at the same time. Interactions could happen either with avatars of other human participants or with artificial agents playing the roles of simplified characters. Some researchers felt that it would be important to provide a substantive and compelling reason for being in the virtual park on a stationary bike in the first place, with consequences for actions

taken. It was not a *gaming*, but a *learning* experience that was sought. The project *Tired of Giving In* (TOGI) was created from the desire to wrap a story around a participant, give them an entertaining and informative representation of the complexities of issues, and allow the participant to unfold the story as they see fit.[8].

TOGI was an interactive story prototype. There was never an intention to implement TOGI in Diamond Park; it was meant, in part, to act as a model for the kinds of interactions that could happen in a VE such as Diamond Park. TOGI told the story of Rosa Parks and the beginning of the 1955 Montgomery, Alabama bus boycott, which is recognized as the start of the American Civil Rights Movement in the United States. A movement that lasted well into the 1970's. TOGI used the major historical characters of the time (i.e. Rosa Parks, Martin Luther King, and E.D. Nixon) to tell much of the story. Along with the historical characters, twelve fictional characters were created as a chorus that represented the diverse opinions and ethnicities of the 1950s era, the past of ancient Africa, and what would be the future, the 1990's.

The diversity of characters showed there were no easy decisions at that time. Sometimes characters that one might assume would be pro-boycott were actually against, and others that one might assume would be against the boycott were for it. While the civil rights movement was largely about Black and White, the truth of the situation was not as simple as that. Looking back on events from the vantage point of the 21st century, it is far too easy for adults, and even easier for children, to not see the potential consequences of thinking or acting a certain way. If an adolescent of today had a way of experiencing a reality where a choice that they would normally take for granted was death defying in Montgomery of 1955, like the decision to walk down a certain sidewalk or talk to a particular person, then they would have a better understanding of that time and place. An implemented TOGI virtual environment would allow a participant to experience first hand that the skin that immersed them also defined them, and much of their experience. It would communicate culture by communicating first hand experience. This is a noble role for VEs to play in the future; a role that is less about the technology and more about the technique of immersion.

The United States Holocaust Memorial Museum in Washington, D.C. offers the visitor an immersive experience that succeeds in communicating culture and first hand experience.[5] The space creates a context that prepares the visitor for traveling back in time to a place where the rules were different, extreme and massively enforced. "It communicates alienation, terror, and the claustrophobia of the people herded into cattle cars, and the disorienting selection process at the gates of the camps after their interminable trip. Visitors go into the building through one of two entrances. This experience is evocative of the arrival of the victims at the death camps, confused about where to go and what is ahead. From here, the visitor enters the Hall of Witness, where, in the words of James Freed, *Brick wall, exposed beams, boarded windows . . . will let visitors know that they are in a different place– that the Holocaust is an event that should disturb and be felt as well as perceived.*"[6]

The Holocaust Memorial Museum is a place of stories. Elie Wiesel, the Nobel laureate and writer who served as chairman of the President's Commission on the Holocaust that planned the memorial, wanted the effort to focus on memory. The reason for creating the museum had to include "…denying the Nazi's a posthumous victory, honoring the last wish of victims to tell, and protecting the future of humanity from such evil recurring."[7] Telling the stories is of critical importance to ensure that our society does not forget, even though others have told similar stories in the past. Movies, books, and plays over the last fifty years have told and depicted various aspects of WWII and the holocaust. The Holocaust Memorial Museum is different than previous efforts because it *immerses* the visitor in elements of the experience. A visitor's ability to understand the enormity of events and absorb the stories is deepened because the space sensitizes them to the stories first. Outside the museum building, visitors are involved in the typical details and concerns of life in 21st century American culture; inside the building, visitors are introduced to a situation where little of that applies. In this mental state, the stories of the millions can be appropriately heard.

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[5] See http://www.ushmm.org/

[6] This passage is taken from a discussion on the architecture of the museum by the American Studies department of the University of Virginia.
http://xroads.virginia.edu/~CAP/HOLO/holo.html

[7] See http://xroads.virginia.edu/~CAP/HOLO/ELIEBIO.HTM

Participation

An important attribute of the museum space or any 3D VRE is that people have a chance to physically as well as mentally participate. Mental participation is assumed to be present or else the environment is a failure. It is always important to engage people's minds, at least to some extent. Sometimes the best way of engaging people's minds is to engage their bodies; orchestrating narrative events and elements in such a way as to encourage understanding of the narrative experience.

While the audience of an oral story participates mentally, forming the shape and color of the details as the storyteller introduces them, there are also examples of physical participation in oral story experience as well. A traditional African and Caribbean story form called *Cric Crac,* is an interesting example of early interactive storytelling. [9] [8] In cric crac stories, the storyteller interjects the word, "Cric?" throughout the story as a question to the audience. Cric asks: *Are you with me? Do you understand me? Shall I go on?* The audience's (usually) immediate response is, "Crac!"meaning: *Yes, we are with you. Yes, we understand you. Yes, please do go on.*

Many times throughout the story the call and response of *Cric-Crac* would be heard. While on the one hand it is a way for the storyteller to check in with the audience, there is another function that this story form serves. Cric-Crac is recognition of the relationship between teller and audience. It is the storyteller confirming, reasserting and acting on his or her role in the relationship, while the audience's response shows support of that relationship and encouragement of the storyteller's work. There is a rhythm to the story, a back and forth sway to the words as the audience participates, actively listening to the story characters and events, and actively listening for their participation cue. Cric Crac stories form a sort of story dance that bonds the audience to the storyteller in a special way and also bonds the audience members to

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[8] This is just one of a great many references by Harold Courlander, a prolific collector of African and Native American folklore and stories. A library or Amazon.com search on "Courlander" will produce a rich resource of references for anyone interested in delving further in this area.

each other. The audience participates together, listening as a group like in a modern day movie theater, but also participating in unison, like in a large rowing ship.[9]

As Kroeber [10] states, narrative participation exists despite the apparent surrender to the flow of the storyteller's words. "Our minds continuously imagine future possibilities… suggested by what we are being told while reassessing what we have already learned, perhaps enthusiastically, perhaps with distaste or dismay. Narrative receptivity thus continuously unfolds and simultaneously folds back into itself, transmuted by the very process of absorbing the meanings it has initiated."

On the opposite side of the narrative and participation scales of oral storytelling are computer games, role-playing computer games in particular. In role playing games the participation is readily apparent and explicit, while often narrative is an element only hinted at, if it exists at all.[10] Finding a middle ground is a challenging task. Clark and Mitchell [11] suggest that instead of focusing on providing an appropriately computed narrative sequences in gaming environments, focusing on narration, or the way a story is told, would be a more fruitful endeavor. Indeed modifying narration to communicate a different message or emphasize different points is a power method of computational storytelling. While it is not necessarily easier than resequencing narrative events and has its own set of challenges, it the effects can be startling.

Terminal Time is a project that supports and encourages a particular type of audience participation in a documentary film screening.[12][11] Both narrative and narration are computationally modified to provide different historical representations to different audiences.

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[9] Cric-Crac stories are still in use today in traditional cultures. In addition, the story form has been adapted for modern audiences. For example, American storyteller Len Cabral comes from a Cape Verdean ancestry and has adapted the traditional "Cric-Crac!" to a contemporary urban "Wa-Sup!"- a colloquial phrase meaning "What is up?" http://www.lencabral.com/

[10] Both Game Research (http://www.game-research.com/art_stories_from_the_sandbox.asp) and GamaSutra (http://www.gamasutra.com/resource_guide/20020916/klug_pfv.htm) have interesting articles about the place for narrative in role playing games.

[11] See also http://www.terminaltime.com .

Once the audience is seated in the theater and a short title sequence is shown on the screen, a computer voice (typical text-to-speech) asks the audience to respond to a series of three questions by clapping. An applause meter displayed on the screen shows the level of their responses, which influence the nature of the first section of the documentary. Each of three sections of the film is about a different period of history, and is preceded by three questions to the audience. Because the audience applause response to the questions strongly influence the narration of the documentary, apparent likes and dislikes of the audience can greatly alter the presentation of history.

The project *AlphaWolf*[12] tries to find a balance of appropriate participation; not based on physical situation as in the case of Terminal Time, but instead based on characters. AlphaWolf beautifully presents a virtual wolf pack where the participant controls the behavior of one of the three wolf pups, using only a microphone and a mouse. The participant must howl, growl, whine or bark into the microphone to affect how their pups interact with their packmates. The mouse is used to control where in the virtual landscape the pups go. [13]

While one of the main goals of AlphaWolf was to create a system for making computational entities that show some of the simple common sense abilities found in dogs or wolves, it is clear from the downloadable video of participants engaged with AlphaWolf at SIGGRAPH 2001 that immersion is happening. Throngs of people are passing in the background on the busy conference floor, yet the project participants are unaware of them, completely focused on the screen, howling into the microphone.

Bringing It Together

This paper has discussed three elements of narrative immersion inspired from traditional oral storytelling. The treatment of time, context and participation in oral stories and other narrative forms is so familiar to us that it is easy to overlook their fundamental value and power in our lives. As narrative beings, we naturally and expertly learn from an early age to interpret time, context and participation. We need these three elements, as well as others, to feed our narrative

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[12] See http://web.media.mit.edu/~badger/alphaWolf.html .

immersion hunger, from which we metabolize belief. Murray states that we do not suspend disbelief so much as we actively create belief. "Because of our desire to experience immersion, we focus our attention on the enveloping world and we use our intelligence to reinforce rather than to question the reality of the experience." [2]

How then do these narrative elements work together? One example is that by appropriately constructing narrative time, an audience would be far less aware of presentation space and time. This is rather straight-forward and can be stated another way as, *Don't be boring*. Laboriously marching through narrative time in a real-time manner can drag down the story; to the extent that an audience member might be very aware of presentation time and space. When a story seems to be dragging, the seat one is in will more likely feel uncomfortable and constraining. When a story seems to be dragging, there is often a concerted effort to keep very close track of presentation time by repeatedly looking at a watch or clock. While the phrase *Don't be boring* might seem trite, storytellers in multiple media have ways of dealing with pacing to keep the audience immersed. In film for instance, the terms *shot*, *sequences* and *scenes* describe varying levels of cinematic granularity based on the notion that narrative time is fully compressible and expandable. While a shot usually represents a real-time capturing of events in front of the camera, shots sequenced together (using cut-aways and visual effects) can be used to greatly compress narrative time. When a film moves along at an exciting pace and then slows to a relative and appropriate crawl at the romantic scenes, an audience may hardly notice the change, but is more likely to comment that the film was good.

By creating a presentation and narrative context that are safe and inviting, and by never violating the audience's established trust and belief that are inspired by the context, varying levels of participation are possible, should the storyteller or story system want it. Narrative context can create reason for participation. It could be argued that Adolf Hitler was a gifted storyteller who inspired active (albeit misguided) participation from his "audience." Preschool teachers must create a safe presentation and narrative context because physical participation in story is almost required at that age.[13] When the computer game Myst was released, it presented beautiful and

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[13] Preschool teachers know that kids will move around and possibly do some unpredictable things when listening to a story. By controlling the presentation and narrative context,

seductive graphic scenes and an inviting musical soundtrack to the player. However, so do horror films! In fact, it took a while for me to build trust with the game because it reminded me so much of a beautiful horror film setting; in part because the game is largely played from a first-person visual perspective. In the beginning I expected the designers to violate their promise that no bad guy with a gun or monster (with a gun) would jump out from behind a beautifully rendered wall and attack me. To my amazement, none ever did; which has made me a loyal fan of the game ever since. Knowing intellectually that I am unable to be *truly* hurt because it is a virtual experience in a digital world is not enough. I could not get hurt lying in bed. What I want is to believe in the narrative world and participate in it, either intellectually or physically.

A computer program called Eliza, created by Joseph Weizenbaum in the 1960's, can quickly tricke people into believing that their computer screen is connected to a wise, intelligent and highly responsive therapist. There is no "intelligence" in Eliza in the AI sense, but the effect Eliza had and still has on people can be witnessed even in today's technologically sophisticated population. This is because as narrative beings, we by nature want to trust and be immersed; immersed in VEs and other digital media, as well as what we engage in the rest of the time.

Today we are not just immersed by our computer screens and advanced VREs, we are also immersed by our lives. While this paper has discussed the connection between narrative immersion and VREs, it would be ridiculous not to at least make mention of the connection between narrative immersion and our daily immersion. It is our lives, after all, that inspire the narratives! Our schedules, responsibilities and goals are more complex than ever and push so many of us to be nearly consumed by them. For assistance with this problem we often look to portable electronic devices. Personal Digital Assistants, cell phones, laptops and even wearable computers all have a growing place in our immersive and often smothering lives. Given that we are so immersed, to what extent will our device interfaces support and empower the productive aspects of our daily immersive experience? Or, will they regularly rip us from the flow of our lives to remind us of the walls, pages, screens and database query protocols of their world?

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experienced preschool teachers/storytellers can channel their audience's natural energy into a controllable participatory activity.

We are always immersed in something, whether it is narrative, a form of media, or just our own thought process. It can be difficult, though, to see what we are immersed in and influenced by; in part because it is all around us and defines us. Alan Kay is purported to have said, "I don't know who invented water, but I know it wasn't a fish." Story is sometimes like that water; it surrounds us, effects us, and defines us so thoroughly that it is sometimes hard to spot and analyze as a driving force in our lives. VREs might help us see our daily real-world a little better, because by creating new virtual worlds, we can see what we might have left out, through comparison with our daily life. Story gives us both a method for expressing that comparison and a key element for bringing closer similarity to the two worlds.

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