New Museum for Contemporary Technology

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Abstract:

Technology for humans has always been a necessity in a world that is constantly changing and developing. It is more important than ever before. Artists produce provocative art works using today's technology. Those art works seem to be hard to understand. But more and more artists become new media or digital artists. When technology is developed, the media is changed. When the media is developed, the way of adopting arts is changed. But also it needs a suitable place to be presented by technology media. However, it seems that existing museums are presenting new media art works in the same gallery space where paintings were used to hang. When the technology is changed, not only the way of adopting the new art forms but also the place of presenting the new art is changed for better understanding of new media art works. In other words, the NEW Art Museum should be able to express new art forms in today's technology. Therefore, this paper aims to find out how an Art Museum express new art forms in contemporary technology through definition of contemporary technology, characteristics of new art forms, and examples of new art forms. In order to research and design the New Museum, the research employed qualitative methods in three section: In the first section, historical research sets a time frame of contemporary technology that happed around 1990 when the World Wide Web was invented. A choreographer Merce Cunningham shows his work, Tracker, using computer technology. The second one explores theoretical implementation of new art forms through literature by Benjamin, Kittler, Manovich, McLuhan, and Bolter & Grusin. It is addressed into five principles: Remediation, Discrete Representation, Modularity, Variability, and Transcoding. The last section looks at art works generated in the past 30 years to see how technology has changed art. It introduces five new media artists of a possible collection at the New Museum such as Jeffrey Shaw, Char Davies, teamLab, Refik Anadol, and d'strict in a chronological order. The project aims to find possibilities of the future of the Art Museum as a public building. The design process will lead to design principles that implement multiplicity in architecture. The resulting design will reflect a relationship between the New Museum, new art forms, people and the city in contemporary technology.

Keywords:
Contemporary technology, New art forms, Remediation, Discrete Representation, Modularity, Variability, Transcoding

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Introduction:

This paper is contributed to the Public Building Graduation Studio. The studio's title is 'The New Museum: Art + the City Re-Wired.' The project site is located in Masshaven Zuidzijde, Tarwewijk, Rotterdam South, the Netherlands. In the history of Rotterdam, pre-war Rotterdam had substandard living conditions. At the beginning of the Second World War, Rotterdam was devastated by a German bombing raid. Therefore, Rotterdam had to start from scratches of the war to become a city that we know today. In this aspect, Rotterdam is a Contemporary City. Moreover, today's Rotterdam is Netherlands' number one city of architecture with the latest high-profile buildings and illustrious icons. In cultural aspects, there are diverse museums such as Museum Boijmans, Kunsthal, Het Nieuwe Instituut, Rotterdam Museum and so on. However, these international Rotterdam images are limited to Rotterdam North. Currently, Rotterdam South has a low education degree, low income, high crime rate, bad health and safety. The south is in many ways worse than the north. Hence, there is mental distance between Rotterdam North and South even though North and South are physically well connected by infrastructures. To reduce the gap between North and South, and to make Rotterdam South a pleasant place to live, the Government has planned developing Rotterdam South such as National Program Rotterdam South(NPRZ). They also planned to develop Hart Van Zuid and Stadionpark as nodes which can connect to Rotterdam Center and other parts of Rotterdam. And the site for the New Museum can be a part of a bright future strategy for Rotterdam South.

As Rotterdam is a contemporary and international city, I focused on Contemporary Art for the New Museum; more specifically, New Art Museum for Contemporary Technology. I think that the NEW Museum should be able to express new art forms in today's technology. Because Technology for humans has always been a necessity. It is more important than ever before. Artists produce provocative art works using today's technology. Those art works seem to be hard to understand. But more and more artists become new media artists. As we can learn from Walter Benjamin's *The Work of Art in the Age of Mechanical Reproduction,*

when technology is developed, the media is changed. When the media is developed, the way of adopting arts is changed. But also it needs a suitable place to exhibit new art forms. For example, it needs indoor exhibition space to display paintings. For sculptures, it needs indoor or outdoor exhibition space. For film, it needs a movie theater. However, it seems that existing museums are presenting new media art works in the same gallery space where paintings were used to hang. I believe that when the technology is changed, not only the way of adopting the new art forms but also the place of presenting the new art is changed for better understanding of new art forms using contemporary technology.

Therefore, the main question of this paper is "How can an Art Museum express new art forms in contemporary technology?" In order to answer the main question, there are sub questions:

a. What is a definition of contemporary technology for the NEW Art Museum?

b. What are characteristics of new art forms in contemporary technology for the NEW Art Museum?

c. What kind of characteristics of new art forms can be transformed to be architectural languages or elements for the NEW Art Museum?

The project aims to find possibilities of the future of the Art Museum as a public building. The design process will lead to design principles that implement multiplicity in architecture. The resulting design will reflect a relationship between the NEW Art Museum, new art forms, people and the city in contemporary technology. In order to research and design the NEW Art Museum, the research employed qualitative methods in three sections:

1. It defines contemporary technology through historical research of technology that happened around 1990 when the World Wide Web and personal computers were invented. In this way, the exact time frame can be also set to show differentiation of art by technology. Merce Cunningham's choreography works by using different technology in different periods (before and after 1990) is taking account of technology art as an example figure.

2. A number of artworks in the past 30 years are introduced as examples of a collection at the NEW Art Museum. Examples indicate the types of contemporary technology, how to adopt new art forms, and how technology has changed art.

3. It explores theoretical implementation of New art forms through literature. It starts from Walter Benjamin to media scholars such as Kittler, Manovich, McLuhan, and Bolter & Grusin to understand new art forms. It provides information on the characteristics of new art forms during the period of contemporary technology defined in the first section. It is addressed into five principles: Remediation, Discrete Representation, Modularity, Variability, and Transcoding to be transformed to be architectural languages.

Definition of contemporary technology:

People can share information that they don't need to meet in reality. People can attend meetings even when they are at home. People can buy what they want and use services they need without going to the store. If people want their friends to see, they can turn on social media such as Facebook and Instagram. This is possible because there is a technology that replaces the real world, World Wide Web. The World Wide Web or the Web is not the result of large projects invested by countries or companies. The web was created by an employee who felt uncomfortable at a nuclear laboratory with the world's largest particle accelerator.

In 1989, the computer scientist Tim Berners-Lee, who was managing computer networks at the European Institute of Particle Physics, came up with an idea, and the result was the web. He has been contemplating how to efficiently manage the information necessary to conduct research projects in a large research organization. In large research institutes like the European Institute of Particle Physics, it is a big challenge to extract necessary information from numerous data related to research conducted in the past every time when a research project is established. Before the web, researchers had to go through all the old data or create another one every time, which was very inefficient.[1] The Internet was already developed in the 1960s and connected research institutes and universities, but it was difficult to access due to different management systems. In addition, the network became more and more complex as the data volume grew and the number of connected computers increased. Rather than getting data through the Internet, it was better to call the researcher in charge and receive it as a document. Berners-Lee was one of the most uncomfortable people with this problem. Then one day in 1989, he came up with the idea of creating an internet space for integration, a platform called the Web. He succeeded in implementing the Web on December 25, 1990, just a year later. It also opened up the world's first website (info.cern.ch) by creating a web browser, a window for accessing the web from a computer. The web thus created was released on August 6, 1991, and was released to the world.

From this day on, humanity's online life has changed.[2] Everyone can use the same website through addresses starting with 'www' and exchange information quickly and easily. With the invention of the web, the online space has become a territory of all that can be used by professionals and non-professionals regardless of borders or organizations.

Therefore, the contemporary technology starts around 1990 when World Wide Web appeared and when information technology became ubiquitous and widely used. It was the starting period that not only researchers use computers but also non researchers could use contemporary technology widely. For instance, Merce Cunningham, an American dance artist and a choreographer, is one of non-researchers who utilized new technology to expand his choreography works. He adopted the technology in his work from his early experiments with television and video to the use of computers. These new media allowed him to sculpt, move, choreograph and reimagine his understanding of the human body in a whole new way.[3]

Before the computer technology, choreographers work with the dancers to build the piece by physically creating and structuring movement. Some choreographers may work with notes, sketches, and floor plans, and some may record work in progress with a video camera to act as an objective eye and a memory aid. This is an iterative and interactive process and proceeds over a period of weeks or months until the dance is complete.[4] With computer based systems such as LifeForms which was designed to assist, Cunningham was able to visualize the sequence and phrases of the dance on the screen which he would then translate to a dancer's body. It was faster and gave unexpected possibilities. In 1990, Cunningham began using computers as a choreography tool. The software LifeForms models and animates the human form. The first dance of Cunningham which was developed with the use of computer technology was Trackers.[5]

When the use of computers became active, it was after the invention of the World Wide Web. Therefore, the time frame of contemporary technology starts from around 1990.

When computer technologies such as LifeForms are developed, new art forms such as Trackers emerges. Besides, as the number of users increased, various technologies were created and used on the web. Graphics were introduced to web browsers that were based on text, and HTML continued to evolve, allowing more information to be presented in a better way.

New art forms using contemporary technology:

While creation was the activity of producing an object with materiality, the practice of new media art is an activity of designing the relationship between the object and the audience. In the old aesthetics, the audience, art objects, and artists existed separately. Art objects were actually fixed by their physical size or their contents. The artist was mostly regarded as the content provider, and the audience was in fact regarded as its consumer. On the other hand, in interactive art, the area designed and entered into it is partially created by the audience in terms of meaning and experience. The artist gets closer to the provider of the context in which the interactivity occurs. The reaction embodies this paradigm shift. There, the behavior of the audience influences the physical nature of the work by their conceptual physical behavior. It goes beyond just drawing meaning out of the work. As a result, the work has an open ending. Here, five examples of new media art in the past 30 years are introduced to look at how technology has changed art by a chronological order. (Since it is not visible to understand the art works only seeing still images, I recommend to look for videos.)

Figure 1. Image from interactive art installation.
Shaw, Jaffrey. "The Legible City." 1989.
Jeffery Shaw Compendium.
https://www.jeffreyshawcompendium.com/portfolio/legible-city/.

Figure 1 is done by Jaffery Shaw who is one of pioneers of new media art in 1989. The Legible City is an interactive art installation in which visitors ride a stationary bicycle along the street, simulating a city of computer-generated words and phrases. Using ground plans of real cities such as Manhattan, Amsterdam and Karlsruhe, The Legible City completely replaces them in text formations. Traveling through the city of this word is, as a result,

a journey of reading. If visitors choose the path they take, these spontaneous combinations of text and meaning are reunited. The bike interface's handlebars and pedals allow viewers to interactively control the direction and speed of movement. In the real world, the physical efforts of cycling are transformed free of charge into a virtual environment, creating a kinematic bond of active bodies in the virtual domain. A video projector projects computer-generated images onto a large screen, while a small LCD monitor in front of the bike shows a simple ground plan of each city and the immediate position of the cyclist there.[6]

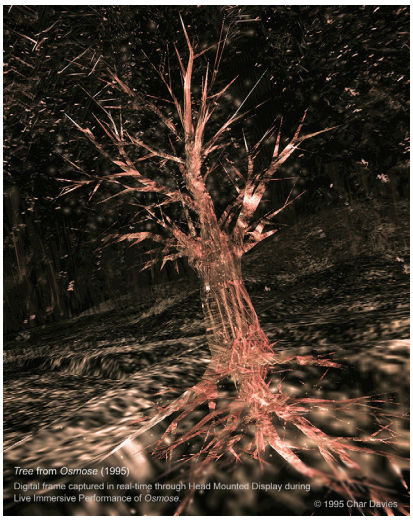

Figure 2. Tree image.
Davies, Char. "Osmose." 1995.
Char Davies Immersant.
http://www.immersence.com.

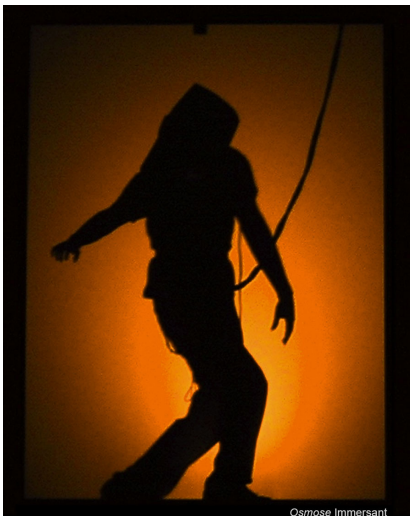

Figure 3. Image from the video installation of Osmose.
Davies, Char. "Osmose." 1995.
Char Davies Immersant.
http://www.immersence.com.

Char Davies created Osmose in 1995. Osmose is an immersive interactive virtual-reality environment installation with 3D computer graphics, interactive 3D sound, a head-mounted display, and real-time motion tracking based on breathing and balance. Osmose is a space that explores the perceptual interaction between the self and the world, that is, a space that promotes one's self-awareness as a consciousness embodied in the space surrounding oneself. Osmose 's immersion begins with wearing a head-mounted display and motion tracking vest. In this way, the visitor becomes a diver and enters the virtual reality. There is a lower layer code that contains most of the actual software used to create the work, and upper layer text, a space consisting of quotes from artists and relevant text

excerpts about technology, body and nature. Code and text work as conceptual parentheses in the inner world.[7]

Figure 4.
View from teamLabBorderless.
teamLab. "teamLabBorderless." 2018. teamLab.
https://borderless.teamlab.art/.

teamLab, who started in 2001, is an international art collective, an interdisciplinary group of various specialists such as artists, programmers, engineers, CG animators, mathematicians and architects whose collaborative practice seeks to navigate the confluence of art, science, technology and the natural world. Their artworks are not pre-recorded images on continuous playback. The art pieces change constantly depending on how the viewers choose to interact with the installed works. As people wander through the world, exploring with intention, creating and discovering a new world with others, visitors do the same experience in the exhibition. In the museum, artworks do not have fixed captions nor explanations because the artworks move through the space. Instead, visitors need to download a guide app that allows visitors to read the concepts of the artworks near them.[8]

Figure 5.
Anadol, Refik. "WDCH Dreams." 2018. Los Angeles, CA.
https://refikanadol.com/works/wdch-dreams/.

A media artist Refik Anadol collaborated with the Los Angeles Philharmonic for the event. Anadol and his team developed stunning visualization for Walt Disney Concert Hall "dreams" using machine learning algorithms to apply machine inltelligence to the orchestra's digital archives which was nearly 45 terabytes of data. The result is a radical visualization of the organization's first century and an exploration of synergies between art and technology, and architecture and institutional memory. Anadol employed 42 large scale projectors, with 50K visual resolution, 8-channel sound, and 1.2 million luminance in total. The resulting patterns formed by the machine's interpretation of the archives is displayed directly onto the undulating stainless-steel exterior of Walt Disney Concert Hall for a week at night.[9]

Figure 6.
d'strict. "WAVE." 2020. Seoul, KR
http://www.dstrict.com/arttechfactory/kr/65-Public_Media_Art_1.html.

In the middle of Seoul, huge waves bend for one minute every 30 minutes with anamorphic technology. It is done through the large L-shaped LED signboard in front of the SM Town COEX Atrium building. During other advertisement is on, it does not attract the attention of citizens. However, every day from 6 am to 12 pm, when the clock is on time or points to 30 minutes, pedestrians passing by billboards are surprised and distracted. This is public media art 'WAVE' by d'strict, a Seoul-based design company to create the user-centered experience by integrating both contents and digital media technology. This public artwork features a massive wave crashing into the sides of what looks like a giant glass tank that was a wrap-around LED display, a 90m wide by 20m tall.[10]

These examples show that when the technology has developed, not only the way of adopting the new art forms but also the place of presenting the new art is changed from around 1990 to present. As technology develops, new art forms do not have limits. It can be displayed inside and outside, day and night. Its scale is limitless from a smartphone screen to a building surface. Also, huge tangible device for installing art is disappearing, while it is possible to store huge amounts of intangible data. Therefore, the new museum will be a building of infinite possibilities that can contain new media art of infinite possibilities.

The implementation of new art forms for contemporary technology:

This section reviews literature in the field of new media for contemporary technology to understand new art forms. Since the previous section defines the period of contemporary technology when computer multimedia became common around 1990, this section focuses on the new media of the same period. The following shows what New Media Art is meaningful as a design principle for the New Museum through the literature of Friedrich Kittler, Lev Manovich, Marshall McLuhan, and Jay David Bolter & Richard Grusin. It is addressed into five principles: Remediation, Discrete Representation, Modularity, Variability, and Transcoding.

1. Remediation

What is New Media? The Internet, websites, computer-generated multimedia, CD-ROMs, DVDs and virtual reality, these are usually subcategories of new media. The 14th century print type and the 19th century photography technology had a revolutionary impact on contemporary society and culture, but it only affected the distribution of media, text, and still images. On the other hand, computers are affecting all types of media, including all stages of communication, including manipulation, storage and distribution, text, still images, video, sound, and spatial composition. According to Manovich's view, new media art can be said to be a work produced and exhibited using a computer.[11] Computer-generated video art, web art, and even work that outputs computer-generated images on paper are included in new media art. However, new media art cannot be viewed separately from the art of the past, as computers contain traditional media, namely text and photographic images. New media expanded its functions by remediating the old media. Bolter and Grusin explain that media defines remediation and refers to the function of translating and remodeling other media in terms of form.[12]

2. Discrete Representation (Numeric Representation)

Numeric representation means that images and forms of new media can be de-

scribed as mathematical functions, and each image or object can be manipulated by a specific operation. An image consists of an array of pixels, and a pixel consists of numerical data ranging from 0 to 255. When you want to give an image a specific effect, you can get the desired result due to the change in number of each pixel. Manovich says that in the case of new media, it is a combination of continuous coding and segmental coding, and here, in relation to the meaning of segmentation, he talks about Roland Barthes "Language is, as it were, that which divides reality." In other words, a discrete representation is required in the communication system, and new media is also a discrete representation in cultural communication.[13]

3. Modularity

Modularity means that discrete elements (pixels, polygons, voxels, characters, scripts) are gathered into larger objects, but each object is combined into a larger object without losing independence. For this, it would be easy to take an image layer in Photoshop. For example, there are individual images in each layer, and the sum and splitting of them can be done with one click.[14]

4. Variability

Through variability, it is said that objects of new media can exist as infinite versions of each other rather than a fixed form. As a synonym, we use the word mutable and liquid. The principle of variability connects many properties of seemingly irrelevant objects, including branching-type interactivity and hypermedia. In addition, the principle of variability is explained as enabling users to change media objects through computer programmers preferring variables to constants.[15] The closest example is a window in a computer. Computer users can use 10 or more windows overlapping at a time, and different representations, texts, graphics, and videos create different spaces in the windows. In addition, icons, menus, and toolbars add another layer to the visual and linguistic meaning. Hypermediacy reveals multiplicity.[16]

5. Transcoding

Transcoding is said to be the most important part of the computerization of media. For example, when we look at the image itself in new media, we see it as an identifiable object, but from a different point of view it is a computer file made up of the color values of pixels in the language of machines. In other words, to convert something in new media means to change its format.[17]

In order to design a New Museum that reflects the characteristics of new media, I propose that the museum itself expresses new art forms by applying the above five principles: Remediation, Discrete Representation, Modularity, Variability, and Transcoding. Since new media is not completely separated from the past, it is remediation. In this sense, the site for the new museum may look back the history of the site such as existing buildings in the site, and circumstance of the site. It shall try to corporate with existing conditions to design the new museum rather than starting from nothing. The representation of new media is different from that of analog media. The biggest advantage of analog technology media is that the form of information is stored as it is, but the greatest disadvantage is that it is difficult to interchange. Computers, which have unified all media and reigned as the ultimate media, solve this problem through code conversion and integration. Unlike analog media in museums with a fixed display order, users can interact with media objects. In the process of the interaction, the user can choose which elements to display and which path to follow. When analog media such as paintings is on display, the collection is visible at a glance. However, new media is invisible at a glance and visitors must continue to explore to discover. In the interactive concept, unlike conventional museums, the new museum is not a continuous building, but discrete buildings. And small discrete building can become a larger scale space. The fragmented masses are scattered over the entire site with characteristics of modularity, variability, and transcoding to be multiplicity as a public building.

Conclusion:

The paper started with the statement that when the technology is changed, not only the way of adopting the new art forms but also the place of presenting the new art is changed for better understanding of new art forms using contemporary technology. With the invention of the World Wide Web around 1990, the term digital media comes to be used along with computer graphics. Along with existing cultural forms, computers begin to host new forms such as web sites, computer games, CD-ROMs and interactive installations, namely new media.[18] For example, when computer technologies such as LifeForms are developed, new art forms such as Trackers by Merce Cunningham emerges. Therefore, contemporary technology starts from around 1990. The new art forms using contemporary technology have emerged from Jaffrey Shaw – Char Davies – teamLab – Refik Anadol to d'strict. Since technology is constantly developing, new art forms keep emerged. Examples of art works show that there are no borders, no limits. Hence, the new museum building which exists with new media art collections shall have infinite possibilities. The characteristic of infinite possibilities can be addressed into five principles derived from media scholars such as Kittle, Manovich, McLuhan, and Bolter & Grusin: Remediation, Discrete Representation, Modularity, Variability, and Transcoding. In this way, it shall find the future possibilities of the museum as a public building which can express the new art forms using contemporary technology. The new museum explores what multiplicity means and future-proofs in today's urban cultural environment. The design process will lead to design principles that implement multiplicity in architecture. The resulting design reflects the relationship between the NEW Art Museum, new art forms, people and cities in contemporary technology.

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