Engaging Communication and Social Interaction Through Interactive Media Facades

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Abstract

Although the facade has been a social structure in the long history of architecture, today it has become a controllable, changeable material in public places, allowing designers to achieve unprecedented visual results and a new architectural visual language by making changes in light and facade properties. Developments in computer technologies and in interface design have created interactive media facades, strengthening the perception and social level of facades in urban spaces. The communicative functions of architectural surfaces have been discussed since the 1970s, and now interactive media facades have resulted in new and effective means of communication in public places and urban spaces. The aim of this study is to analyze interactive media facades to determine the interactive relationship between architecture and communication.

Keywords: Communicative Facades, Interactive Media Facades, Media Architecture, Urban Communication, Social Interaction

Etkileşimli Medya Fasadları Yoluyla Etkili İletişim

Özet

Mimarlık tarihi boyunca „fasad" sosyal bir yapı olarak var olmasına karşın, son yıllarda bilgisayar teknolojilerindeki gelişmeler mimari fasadları kontrol edilebilir, değiştirilebilir, farklı şekillerde kullanılabilir bir yapıya dönüştürmüş, tasarımcılara ışık ve tasarım yoluyla mimari yüzeylerde değişiklikler yaparak daha önce eşi görülmemiş görsel sonuçlar ve yeni bir mimari görsel dil elde etme imkanı sunmuştur. 1970'li yıllardan itibaren mimari fasadlar iletişim aracı işlevleri ile öne çıkmakla birlikte, bugün tasarım teknolojilerinin geldiği nokta ile ortaya çıkan etkileşimli medya fasadları kentsel mekan ve kamusal alanda yeni ve etkili iletişim biçimleri sunmaktadır. Bu çalışma son yıllarda kullanımı hızla artış gösteren etkileşimli medya fasadı örneklerini analiz ederek, etkileşim yoluyla oluşan güncel mimari ve

iletişim ilişkisini ortaya koymaktadır.

Anahtar Kelimeler: İletişim Fasadları**,** Etkileşimli Medya Fasadı, Medya Mimarisi, Kentsel İletişim, Sosyal Etkileşim

Introduction

Since 1980, the use of electronics and information technology in architecture has popularized the use of architecture as an instrument of communication and has transformed architecture into a medium of communication supporting written and electronic media. This has led to more prominence given to the commercial use of architecture even beyond its function. Within this new design approach, the term "medium" is preferred to 'architecture' and the terms "urban screens", "video wall" and "media architecture" are gathered under the umbrella of "media facade". These forms of media facade have become very popular in recent years and are defined as the enhancement of urban space and architecture with interactive and digital technologies supported by sensor networks and mobile devices.

Architects are now using different methods of communication technologies to exhibit their works in urban spaces. A media facade contains a message and a structure in itself. The function of the building within urban space architecture is supported by the media facade and causes significant changes in the design of the traditional urban space and architecture as well as providing advertising, entertainment and communication. With the recent increase of media facades, changes have taken place not only in the architectural space but also in the digital media, with this formation combining different disciplines such as art, architecture, engineering, city planning, media and digital culture.

Media Integrated Architectural Surfaces

Many architects, including Venturi and Virilio worked on and defined the new communicative function of architecture. Robert Venturi stated that the electronic facades required by the information age and commercial culture are not only a bigger and more sophisticated version of billboards but also an information surface, the message on which can constantly change and set dialogues contrary to the static appearance of traditional architecture (Venturi, 1977; Venturi, Scott and Izenour, 1977; Virilio, 1985). Today, architecture has the power to support printed and electronic media, which has cleared the way for a communication function and commercial use of architecture (Erkayhan, 2011, p.143; Erkayhan, 2012, p.1296).

The messages of media facades contain structure. In *"The Medium is the Message"*, McLuhan mentioned the effect of technology and different forms of media on human communication and habits, and the direct connection of these technologies with the effect of the medium in society and the content transmission from medium on the qualities of the medium (McLuhan, 1964). This transformation of architectural facades is covered by urban space advertisement surfaces through electronic screens.

In the postmodern era, the advertisement promoting the building became more prominent than the building itself. This was studied by postmodernist architects Robert Venturi and Denis Scott in the book "Learning from Las Vegas", with the example of the famous 96[th]Avenue known as the *"Strip"*. The communications from buildings increased in size as it was necessary to address people passing at a minimum speed of 100 km in cars rather than pedestrians. Bigger, more attractive sign boards were required for the shortest and most effective communication not posters (Venturi, Brown, and Izenour, 1993).The size of the signs became larger than the buildings and so small buildings with big facades compared to the functions happened to be found in that boulevard. The purpose was to draw the attention of cars passing on the street and therefore the signboards were influenced by the spaces, such as hotel and shopping centers, not the direction. Venturi stated that "this has become architecture in the landscape and a symbol in space" (Venturi, Scott and Izenour, 1977).

Studying the relationship between architecture and new media under the topic "media building", Paul Virilio compared "media building" to structures such as mediaeval cathedrals and Gothic churches. Paul Virilio (1985) explained the media architecture as follows:

> From the beginning architects have shaped mass, just as they have utilized energy; information on the other hand has still not been really used. If we consider a cathedral, this constitutes a means of mass communication. During the middle ages, information was transmitted through its stained glass windows, sculptures, tapestries, mosaics […]. But this information was fixed, static, constant, only renewed through the action of language and songs. Today, on the other hand, we are entering an age when information is active and interactive; in other words, we are no longer just dealing with frescos on walls, sculptures in niches or stained glass windows, but with a place of action and interaction. Because of this, the architect must apply himself to this third dimension (Ranuala, 2001, p.23).

Churches, which were a gathering place for people, were constructed in a way to draw

attention and interest among other structures. The huge rose windows of Gothic churches, which were strikingly evident in sunlight, were replaced by signboards and then in the digital age, by LED screens, as the desire remained to convey a message from the facade of a structure. With advances in communication technologies, one-directional communication became interactive two-directional communication.

Media Facades and Models

Media facades were introduced as a means of mass communication to create an environment where information is circulated and public opinion is shared, making urban space more fun and allowing people to reflect their moods. The creation of this environment turns urban space into a multi-user game area.

Manovich stated that physical space has long been augmented by images, graphics and type, but replacing all of these with electronic displays makes it possible to present dynamic images, to mix images, graphics and type, and to change the content at any time (Manovich, 2006).

Media displays are classified as traditional model, reactive (environment model) and interactive model. In traditional models, which are still the most popular form of media façade, one-way communication is established with the building assigned to convey the message determined by a centre. In the reactive (environment) model, the media façade changes colour, shape etc. on the building facade according to the reaction mechanisms determined according to the environmental conditions in the urban space. The concept of user involvement emerges with interactive media facades (Tekin, 2015).

Interaction with Media Facades

Interactivity can be defined as a type of feedback that provides the means to control and change information (Yue, 2009, p.149). With developing media technologies, interaction technologies such as door opening sensors and illumination systems have begun to add to the environmental dynamics within the scope of "spectacle and surveillance" of cities. However, such technologies have passive interaction with the users and there is no need for effort to participate. The active participation of people living in a city started with the new media art and HCI (Fischer and Hornecker, 2012).

The term 'interactive media facade' suggests that building facades can act in such a way as to have an effect on human beings (Herr, 2012, p.100). In the last century,

HCI research laboratories designed interactive digital displays and these displays started to be used in private and semi-public areas. New media artists and digital designers have had a direct impact on architecture following further developments in interaction design and software.
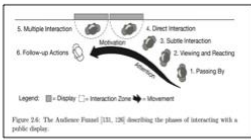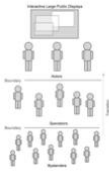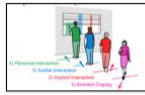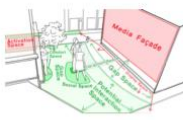
Solid, stable facade design has transformed into a structure that can move, change, transform and adapt to the environment. Even though "interactive media facades" are a small field under "media facades", they are more flexible with interaction, and confront us as an architecture that can change based on the requirements, expectations and desires of the users and also react to the environment.

With the technological advances and the reduction of construction costs of public displays, the use of interactive displays in urban spaces has rapidly increased. However, it has become more important to attract people's attention and to include more people in the interaction. One of the most frequently used methods of interaction with the building facade is with the use of input devices such as smart phones, cameras, computers and tablets. In this case, all the media display can be viewed on the display of this device and intervention to the surface of the building can be provided by this display. Thus, the user can make an impact on the building by touching the device in their hands, thereby initiating interaction between the media facade and people.

There have been various models in respect of interaction between public displays and users in a public space, the behaviours of people connected to this display and the factors affecting design. These models have become a guide to human behaviours and their interactions with displays. According to published studies, many interaction models are defined as displays of different dimension and qualities in public spaces and this display provides information on the changes in the behaviour of the people around. This provides guidance for interactive display design. Although these models are provided by displays of certain dimensions, the behaviours of people, i.e. the users, are similar and thus the behaviours of people provide an example for designers.

The models concerned are usually related to the interaction between displays in urban space and the users (Table 1). In such scenarios, the interaction area is in front of the display and there are very few people as users. Although the sizes of the urban space and the media facade are different, the reactions of users in the urban space are similar.

Table 1. Interaction Models

INTERACTION MODELS

Brignull and Roger's Model	Michelis and Müller- Audience Funnel	Kaviani- Role Centered Model	Vogel and Balkarishman	Fischer and Hornecker Model	PACD Model
1. Peripherical Activites 2. Focussed Activities 3. Direct Interaction	1. Passing by 2. Viewing and Reacting 3. Subtle Interaction 4. Multiple Interaction 5. Follow-up Actions	1. By Standers 2. Spectators 3. By Standers	1. Ambient Display 2. Implicit Interaction 3. Subtle Interaction 4. Personal Interaction	7 interaction zones 1. Gap Space 2. Social Interaction Space 3. Comfort Space 4. Activation Facade	1. Passive Engagement Zone • Glimpse interaction • Immersive interaction 2. Active Engagement Zone

Interactive media surfaces provide cooperation between people, which is different from the other media surfaces. Group members use the displays in a coordinated and organized manner and the goals of these groups in the use of the display are similar. Therefore, it consists of a fixed installation, which is usually known by the users to provide ease of use in interaction (Gehring, 2013).

The displays used in public spaces are perceived as a stage and the ways of interaction of people on this stage vary depending on the personal qualities of the participants. While an introverted or shy person refrains from interacting with the display and does not focus on what is on the display, an extrovert can take the chance to benefit from the opportunity and make a show for viewers (Brignull and Rogers, 2003).

Research

The aim of this study was to analyse interactive media facades to detect the changing role of architecture as a new communication tool and the contribution of interactive media facades in public spaces in relation to technology, media and communication.

Although the field of interactive media architecture has been rapidly growing around the world in recent years, there are as yet no remarkable examples in Turkey. Therefore, the samples of the study have been selected from interactive media facades in other countries. In order to evaluate the wide range of interactive facades, 9 examples of different types, technologies and models were selected (Table 2).

Table 2. Interactive Media Facade Samples

Media Facade	Building	Inspired From..	Input	Event
BIX	Kunsthaous	"Big" And "Pixel"	Mobile Device	Would You Like To Comment?
Megaface	Megafone	Selfie And Mount Rushmore	User's 3d Laser Scanned Photos	Sochi Olympics
Climate On The Wall	Ridehuset Facade	Magnetic Poetry	Body Recognition	Aarhus Co2030 Organization
Superhero	Empire Store Building, Brooklyn	Superhero	Kinetic Cameras, Body Recognition Costumes And Realtime Video Images	Dumbo Art Festival
FIESP	Avenida Paulista	stage for social encounter	SCSD Feedback Device, Id Cards	Viva Cidade Festival
Lummo-Cityfireflies	Medialab Prado	Tetris- Monsters Game	Mobile Phone	Global Gamejam
Iris	Ars Electronica	Puzzle- Painting	Mobile Phone	Ars Electonica Festival
Puzzle Facade	Ars Electronica	Rubick's Cube	Interface Cube	Interface Culture
Blinkenlight Arcade	Biblotheque Nationale De France	Arcade Painting- Arcade Game	Mail- Mobile Phone Light	Nuit Blanche Festival

Taxonomy of Interactive Media Facades

Media facades are based on different technologies and they are situated in unique, dynamic settings. There are different approaches in literature to categorize media facades, resulting from different perspectives on the matter. A common perspective is to focus on the technical, social and creative challenges of media facades.

In this study, categorization of the samples was made according to the Haeusler model, in which media facades are classified from an architectural perspective, based on the underlying technology. The facades are classified as Mechanical Facades, Projection Facades, Window Raster Animation Facades and Led Media Facades (Haeusler, 2009). In this way, the samples were evaluated according to technological basis, dimension, expression type and purpose (Table 3).

Table 3. Taxonomy of Interactive Media Facades

TAXONOMY OF MEDIA FACADES

	Mechanical Media Facades		Projection Facade		Led Media Facade		Window Raster Animation Facade		
	BIX Facade Kunshaous Graz	Megaface	Climate On The Wall	Superhero	FIESP	MediaLAb Prado Lummo-CityFireflies	Iris	Puzzle Facade	Blinkenlight Arcade
Dimension	3D	3D	2D	2D	2D	2D	2D	2D	2D
Expression Type	3D virtual Model	3D virtual Model	Social Community Network	Entertainment	Social Community Network	Entertainment	Entertainment	Entertainment	Entertainment
Purpose	Organization	Organization	Organization	Game	Game	Game	Game	Game	Game

Case Study Analysis

Mechanical Media Facades

Mechanical media facade examples usually include the fully covered exterior facade of a building. The facade may kinetically transform and this transformable animated facade system constitutes the external form of the building. The main objective is to present a kinetic animation to viewers instead of digital content and this is characterized by the perception of displays and light elements in three dimensions (Haeusler, 2009).

BIX Façade

Environment. The name of BIX media facade is derived from the words "big" and "pixel". This architectural structure in Graz, Austria Graz was constructed for the event, *Would you like to comment?* so that the facades are used like a computer screen and the building created an environment of interaction and sharing in the urban space.

Technology. The facade of the building with a biomorphic appearance consists of 1300 independent plexiglass panels. The eastern facade of the Kunsthaus (Graz Art Museum) consists of a 900 square meter facade with 930 fluorescent light tubes placed in the shape of a conventional circle. The brightness times of the circular fluorescent light tubes used in the building can be increased to 18 frequencies per second and various animations can be reflected on the facade (Media Architecture Biennial, 2012).

Interactivity. The BIX media facade creates an interface for media displays and art programs included in the museum, thus providing the possibility of viewing on the facade of the building. In the sixth year of its construction, the BIX facade provided users with an opportunity to interact with the display through mobile devices with the activity of *"Would you like to comment?"* Users were able to send any image they wanted to the pixels of the BIX Facade and to participate remotely through a website.
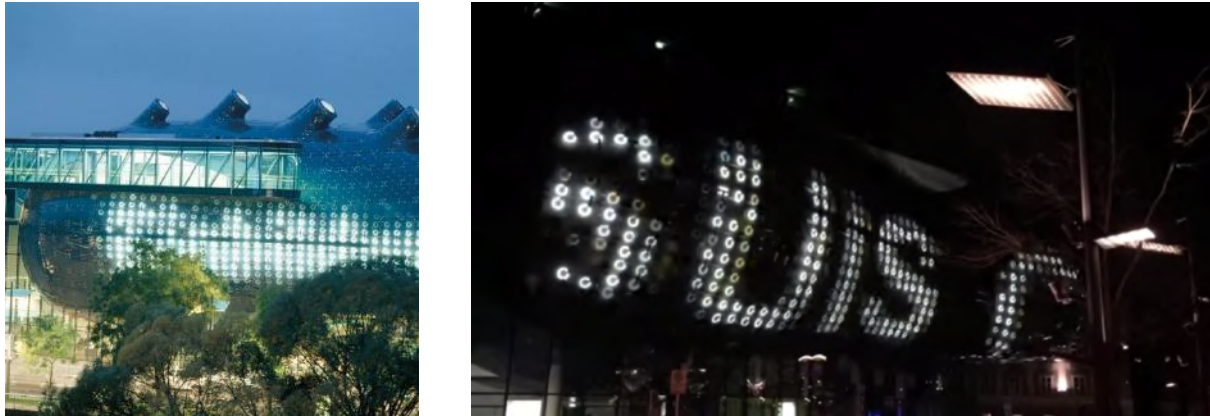
Figure 1. BIX Communicative Display Skin, Kunsthaus Graz, Austria, 2003 (Media Architecture Biennial, 2012)

Megaface

Environment. MegaFace, which is a structure of the Russian telecom operator MegaFon, was designed by Asif Kahn. The building includes many photography cabinets and is located at the entrance of the Olympics venue. This structure became a giant media display during the 2014 Sochi Winter Olympics.

Technology. The faces of the participants were photographed and scanned, then formed into three-dimensional images, and transferred to the cable and machine system. They are connected in this system to 10,000 light cylinders called "actuators" that can expand up to 2 meters and the human faces are created this way. This facade showed 3 faces, each 8 meters in height changing every 20 seconds.

Interactivity. Media Façade provides users with the possibility to see themselves in three dimensions on building surfaces and share this image. The users do not know when their faces will appear on the building front after their pictures have been taken and therefore an SMS message is sent tot he person's telephone with the link where they can watch it later if they are not present when their face is shown. This MegaFace interactive installation has been called the "Mount Rushmore of the Digital Age" with a three-dimensional image achieved through the internal and external movements of narrow tubes. This structure became an important symbol of the Sochi Winter Olympics, giving people a democratic environment where they could express themselves (Foster, 2014).

The facade installation in the Megafon building was visited by around 170.000 people during the Olympic Games.

Figure 2. MegaFace, Sochi Olympics, Russia, 2014

(http://www.asif-khan.com/ ; http://inhabitat.com/collosal-megaface-pinscreen-will-display-led-lit-3d- portraits-of-sochi-olympics-visitors/asif-khan-3d-faces-megaface-7/?extend=1)

Projection Facade

Another method of applying the animated image onto the building facade is to reflect it onto the building. In this method, the building facade is used as a temporary media facade and does not require any big interventions in the architecture, as the building facade is covered like a screen using high resolution HD video, animation and images. Static building surfaces become animated video images through projection mapping which is very popular. Projection facades can be adapted more easily to curved, circular, complex and difficult facades (Haeusler, 2009).

Climate On the Wall

Environment. This installation was a part of the Aarhus CO2030 organization in Denmark, and was built to draw attention to the increase in carbon emissions related to the congress held in Aarhus in 2009 with the aim of neutralizing carbon emissions by 2030.

Technology. One facade of the Ridehuset building was used as a display and an image was created with projection technology (using projection with two overlapping images). In addition, cameras were used which detected human movement and created speech bubbles.

Interactivity. During the climate exhibition, people in Aarhus had the chance to share their views on climate change issues, such as carbon emission. A program was created where by the words grow bigger and turn into speech bubbles when people stand in front of it. Thus, it allowed the participation of people by displaying their sentences on climate change and carbon emission.

Figure 3. Climate On The Wall, Ridehuset Building, Aarhus, Denmark, 2009
(http://www.youtube.com/watch?v=SSsWvVOGhvI; http://vimeo.com/10229720)

Super Hero

Environment. The Dumbo Art Festival is one of the most creative and largest technology festivals in New York with the interaction of around 1400 people in three days. Superhero is a kinetic video mapping show in an architectural aspect within the urban space and it transforms the people around the Empire Store building in Brooklyn to the appearance of super heroes with reflection throughout the festival (Wildbytes, 2012).

Technology. Kinetic cameras, costume software and real-time video imaging are used for the show. The bodies of the participants are scanned by kinetic cameras and are formatted to a 3-dimensional super hero appearance on an architectural facade.

Interactivity. The mapping show transformed passersby into superheroes and animated graphics in bright colours and pixels were presented to viewers with the kinetically controllable projection. They had the qualities to take giant or dwarf sizes for a short time and to move faster than the speed of light (Padilla, 2013).

Figure 4. Superhero, Brooklyn's Empire Store Building, NewYork, 2012 (http://www.fubiz.net/en/usersstuff/first-kinect-controlled-interactive-facade-projection-to-transform-passersby-into-superheros-2/ ; http://thecreatorsproject.vice.com/blog/be-a-real-life- superhero-with-your-favorite-sidekick-gesture-based-technology)

Led Media Facade

Led Media Façade consists of covering the exterior of a building with "light emitting diode" (LED). Media displays are used at a resolution proportional to the pixel number depending on the technology used (Haeusler, 2009).

The FIESP Building

Environment. Avenia Paulista is the main boulevard in Sao Paulo, Brazil and is one of the most important finance centres in South America. The FIESP building which has a grey facade in the daytime is located in a place that can be seen by everyone.

Technology. The public transport system ID cards were used during this event as an instrument to find out the views and opinions of people about the city (Behrens, 2013).

Interactivity. Through the project, users had the chance to express the difficulties and pleasure they experienced in Sao Paulo. For this study with different social groups, workshops were organized and five different difficulty groups were created, namely environment, flow (mobility), security, urban space and accommodation. The users chose one of these categories and demonstrated their opinion with one of the three expressions of happy, indifferent or sad. Then these selected expressions (happy, indifferent, sad) were reflected on the LED media facade. 588 interactions were carried out by 560 different users who stated their views on the city (Behrens, Valkanova, Schieck and Brumby, 2014).

Figure 5. The FIESP Building, Sao Paoula, Brazil, 2013 (Behrens, 2014)

MediaLab Prado, Lummo and City Fireflies

Environment. One facade of the MediLab Prado building in Madrid, Spain is covered by 15x10 Led screens to create an interactive media display where the light source is used as an interaction tool. Lummo and City Fireflies are the digital games that were applied on the media facade of the MediaLab Prado building (Dezeen Magazine, 2013).

Technology. The image was provided by Philips Color Kinetix LED system for this activity. In the example, a Tetris game can be played in two different ways controlled by mobile devices. (1) with the buttons appearing on the mobile devices, (2) acting together with mobile devices in front of the media facade. The locations of the users are determined by GPS sensors; thus information was obtained on the performance content of the game.

Interactivity. Lumm blocks, which is basically a new version of the legendary tetris game, were created in order to provide social interaction. In the game, which has 2 different versions; in the first version, 4 people try together to form the Tetris pieces while in the second version, 2 people play with one changing the shape of the tetris and the other providing the orientation.

City fireflies is a simple fiction created as a game. Users try to eliminate monsters on the media facade before they eat up the display of their mobile phones, and they move up to next level when they are successful. The fact that the game is easy helped to reach more users and the multiplayer option allowed a more collaborative interaction (Eumedianet, 2010).
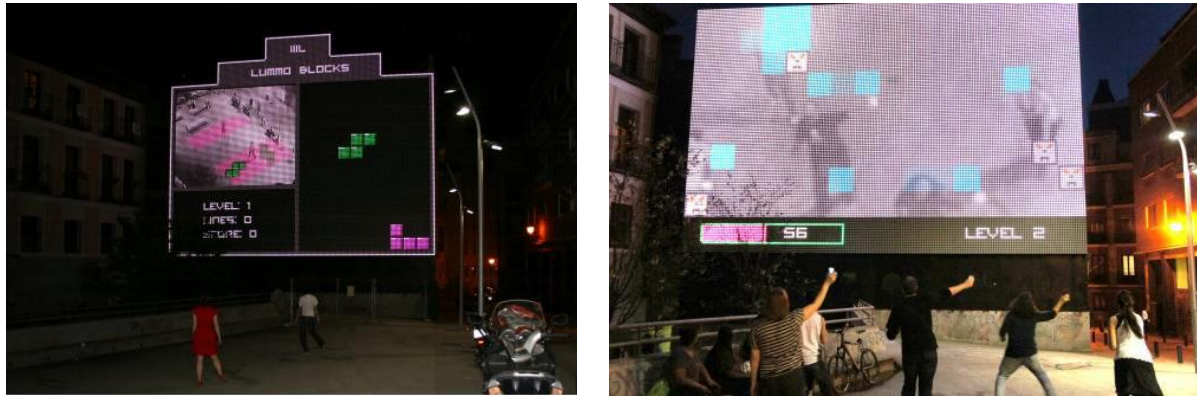
Figure 6. Lummo, City FireFlies, MediaLab Prado, Madrid, Spain, 2010/2011 (http://medialabprado.es/article/lummoblocks_en_la_fachada_digital)

Window Raster Animation Facade

In Window Raster Animation façade, each window is covered with light emitting elements (LED). Thus, each window of the facade becomes a pixel of the media façade so the number of pixels is equivalent to the number of windows. Therefore, buildings with many windows are preferred more as they have clarity in direct proportion with the number of windows (Haeusler, 2009).

Puzzle Facade

Environment. The Ars Electronica building was transformed to a Puzzle Facade as a giant Rubic cube for the "Interface Culture" Project in the University of Arts and Industrial Design in Linz, Austria. Throughout the event, users could experience trying to solve this intelligence cube on the building in a public place.

Technology. The data contained by the interface was sent through Bluetooth to the software of Puzzle Facade. This software created light and colour changes in the Ars Electronica building and allowed user to participate by making changes on the building with a small cube in the hand (Jobson, 2013).

Interactivity. The participants saw the giant, coloured version of the cube and changed the surfaces and started to solve the puzzle. The use of a popular game made it easy for people to participate in the interaction. The media facade of the Ars Electronica building consisting of pixels made a very convenient background for the rubic cube.

Figure 7. Puzzle Facade, Ars Electronica Center, Linz, Austria, 2013

(Lloret, 2013; http://www.aec.at/aeblog/en/2013/12/13/puzzle-facade/)

Blinkenlights Arcade

Environment. The Tower T2 building of the Biblotheque Nationale de France was turned into a giant computer screen for the Nuit Blanche Festival in Paris.

Technology. A giant computer was created with a pixel screen consisting of 520 windows covering an area of 3370 m2. With the new design light technology, the Blinkenlights team was able to easily adjust the brightness of the facade and for 12 nights it was possible to view large animations clearly (http://blinkenlights.net/arcade).

Interactivity. Arcade Paint. The participants could download the Arcade Paint program compatible with Windows and MacOsxfrom the Blinkenlights site to then load their pictures and animations in Gif format by mail and subsequently see the image on the giant screen.

Arcade Game. This provided the opportunity to play popular games such as Tetris, Pacman and Puzzleon the giant display screen. Participants joined the game through their telephones. With the light control technology, Blinkenlights allowed separate play with the light in each pixel (http://blinkenlights.net/arcade).
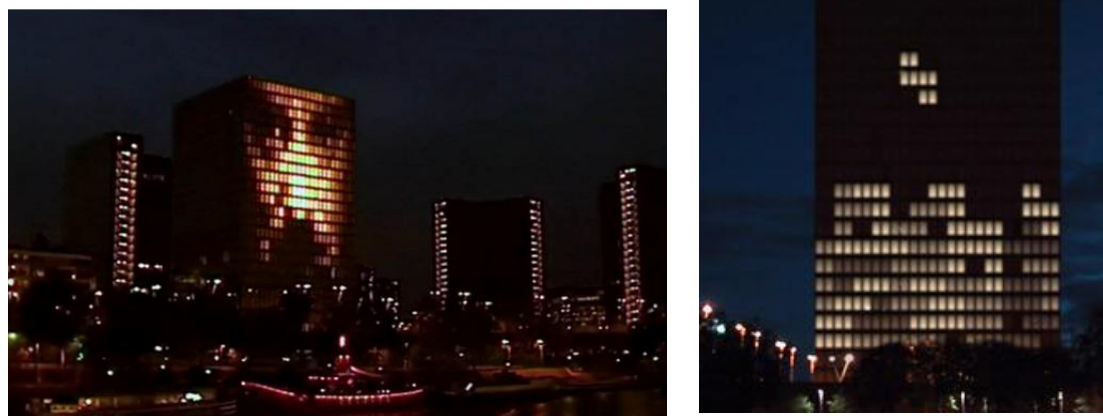
Figure 8. Blinkenlights Arcade Paint, Arcade Game, Biblotheque Nationale de France, Tower T2, Paris, France, 2002   (http://www.reallybigroadtrip.com/2012/10/gracefully-chaotic/; http://jeffmilner.com/2005/06/blinkenlights.htm)

Iris

Environment. During the installation of IRIS for the Ars Electronic Festival, a user-centred design approach was applied and the hardware and software were implemented accordingly.

Technology. An interactive media surface that can be seen from a distance of 300 meters, consisting of 400 LED and 1087 windows for the Ars Electronica Festival. The desired resolution was achieved by "Touch projectors". Participants were able to interact from a maximum of 50 meters with mobile devices such as smart phones which have a camera and 3G technology.

Interactivity. Users interacted with the media facade through two different concepts. One was a "solving a puzzle" game, where several people can interact and race simultaneously or compete only through the media display. The other one was "painting on the facade" which allows participants to paint the building surface as desired by selecting the colours and brightness through the application on their telephones.

With the interaction, users created changes on the media facade and realized that they had the power to change the facade even if only for a short time. As one participant stated, "*Finally, we have control over a building*" (Gehring, Boring and Wiethoff, 2011).

This interaction created social inter-personal union and collaboration while it also formed a competitive environment. For many users, it was entertaining to intervene in the games of other participants. It was even observed that interventions also took place between

people who did not know each other. Especially when people interacted simultaneously, they created unintentionally interesting pictures with the screen they painted (Gehring and Krüger, 2012).
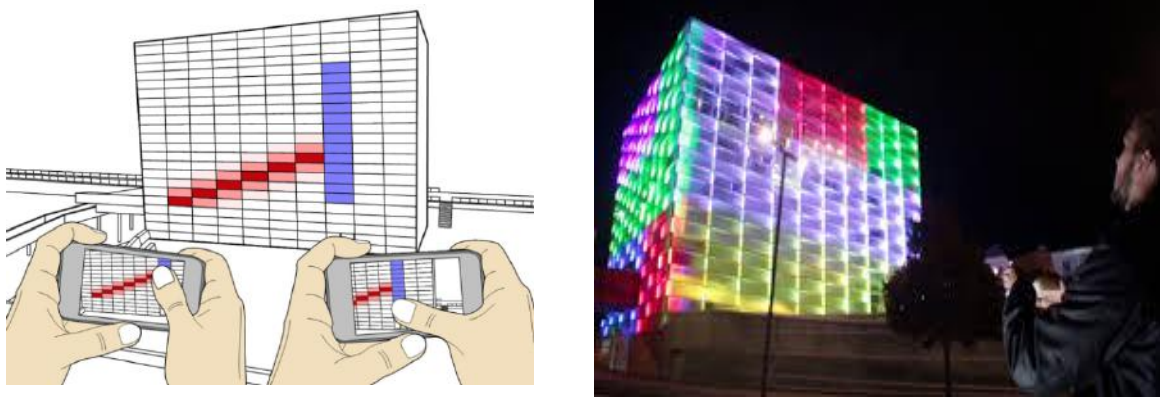

Figure 9. Iris, Ars Electronica Building, Linz, Austria, 2010

(https://vimeo.com/22991824 ; http://vimeo.com/229918242)

Conclusions

With public displays, such as billboards, which are the traditional model of one-way interaction, people are just a reader or viewer. With interactive media, the concept of "user" emerged and it was important to motivate people to ensure that the interactive media attracts potential users and they become a user in the system. The increase in the use of computers and in the popularity of multi-user games has been a big factor behind the mainstreaming of interactive displays in public spaces.

In this study 9 samples of interactive media facade were analysed. The purposes of the interactive facades and the results obtained results are summarised below (Table 4):

Table 4. The Purpose and Results of the Interactive Media Facades

INTERACTIVE MEDIA FACADE	PURPOSE	RESULTS
BIX Facade	In the 6th year event of the Media Facade, it was intended to turn the BIX building into a media facade where everyone is in interaction.	User participated in interaction by joining both in front of the building and remotely through website, and then a piece of the facade was displayed at MOMA.
Megaface	Selfie and emoticons were the inspiration for a giant-architectural interaction platform during the 2014 Sochi Winter Olympic Games.	An environment was created where people could express themselves. It was visited by around 170.000 people to make the building and its surrounding a popular place.
Climate on the Wall	Interacted wall was made by projection mapping to draw attention to carbon emission.	Surrounding people were in interaction intentionally or not while dialogue was established with those who did not want to express views on climate.
Superhero	An interactive environment was created during the technology festival where the public participation was involved.	1400 people were in interaction during the festival and had the excitement of becoming a 3d superhero even for a short time.
FIESP Building	During the festival, they were allowed to convey their views on the city of Sao Paulo through media facade.	588 interactions were created with 560 different users where they expressed more views on the subject they were happy with. A social assembly area and a democratic environment were created through media facade.
MediaLab Prado Lummo / CityFireflies	In the structure where the wall of an old industrial building turned to a media facade, a social interaction environment was created in urban space by games.	The region where MediaLab Prado was located turned into a popular and touristic area.
Puzzle Facade	The Ars Electronica building for the Interface Culture Project was turned to a giant Rubic Cube to ensure participation of users in the event.	Users had the chance to play with the Rubik cube of architectural size using the real size Rubik cube in their hands.
Blinkenlight Arcade	An interactive environment was created by games and paintings on the giant screen throughout the festival.	It provided colour to the nightlife in Paris and became a building drawing attention with visual aspects for 12 days.
Iris	An interactive environment was created by games and paintings on the giant screen throughout the festival.	Participants had the experience where they could control the external facade of the building and make changes in it. People who didn't know each other got in interaction simultaneously to create a collective public environment of sharing.

The Inclusion of Architecture in the Media Society

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The new interactive media facades not only change the function of architecture but also affect the behaviours of people in urban spaces. People can now become "users" and change the shape of the facade as desired depending on the potential of the facade. With users who can interact with architecture and change content individually or in groups, not only architecture but also the behaviour of people and their way of perceiving the environment in all urban spaces are transformed. Thus, media architecture can be defined as the passive or active interaction of physical structure and digital media with the information facade.

Media facades were introduced to create a convenient environment of mass communication. Technological developments turned media screens into a fun communication tool, as an area where information and mood are reflected and shared, multiplayer games are played and participants are allowed to change content.

As architecture has always had a media function, a description of the architectural environment, building and media effect is needed. While in the past architecture was used to represent power, wealth or spirituality, it has now started to be used for communication purposes.

Having buildings and users as objects of communication is of increasing importance in society. This is not merely related to the transformation of the content shared with the media facade or the building to a dynamic visual tool, but is also related to the inclusion of architecture in the media society. Architects have started to take a central position in the media society.

Interactive media facades are important for mass communication in a metropolis with multidisciplinary features in social, cultural, architectural, economic and cultural aspects and have significant potential for marketing communication in entertainment and other sectors. This increases the number of media facades. The multidisciplinary nature of this new communication tool affects many different areas, including architecture, design, urban planning, communication, and interaction design. A metropolis is the most suitable place for interactive media facades as mass communication, marketing, entertainment and culture are important and there is the capacity for new technology.

Interactive Facades as a Tool of Social Interaction

Urban space is used as a temporary and peripheral area for production and introduction of different social interactions. It hosts various events and activities required by social life and the integration of people into different social and cultural structures. This demonstrates the importance of urban space in the development of social habits. This is not

limited to a certain group, but includes people of different ages, cultures and intellectual levels combining to provide social interaction between people.

Several technological developments, affecting the dynamics of the city are becoming a part of daily life and can be applied to the built-up environment. Public displays, media facades, and big projection displays are becoming a part of the city. The transformation of dynamic digital information into a construction material of architecture has started to shape the social interaction between people and perceptions of urban space.

The transformation of building facades into visual information and presentation areas and the perception of these as a kind of interface has encouraged the development of various social interactions. Most displays are used for advertising and commercial purposes and do not have direct interaction with the environment, while those which are interactive are more interesting and provide a great contribution to social interaction.

The new interactive media facades not only change the function of architecture but also affect the behaviours of people in urban spaces. People can now become "users" and change the shape of the facade as desired depending on the opportunities of the facade. In many cities "brandscapes" have been created as a technology-dominated space providing interaction, collective sharing and unexpected cooperation (McQuire, 2008). For example, in the Climate on the Wall event, people who did not know each other started dialogues on the wall and in the Painting on the Façade Event, Irish people who did not know each other had the chance to come together between games.

As a consequence, this new communication tool provides recognition of citizens as "consumers" and at the same time "producers" and they can control the building facade which was previously rigid and fixed, and interaction between strangers is initiated. Associated with active participation in urban spaces, democratization is supported. As a result of interactive media facades in an urban context, effects are felt over a wide range and the results of implementation include social and cultural effects. With this new communication tool in urban spaces, buildings again become landmarks and the area where there are interactive media facades becomes more popular. Thus, interactive media facades cause significant changes not only in communication and social interaction but also in urban space and architecture.

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