

MULTIMEDIA IN ARCHITECTURE AND SOCIAL COMMUNICATION

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Purpose: The aim of the study is to determine the role of multimedia technologies used in architecture for socially significant communication. It is important to answer the following question: Can the content and graphic shapes included in the façade be used to shape public awareness and create social identity? One of the objectives is to examine the marketing potential of a message included in an image on a façade, and the possibilities of using it in building a region's brand.

Design/methodology/approach: The examination included 15 buildings in which various multimedia technologies were used with the intention to create a message. Among the solutions applied in these objects are those in which the message is composed directly, by a metaphor, or indirectly in combination with the architectural features. The research material was analysed, and groups of useful subjects were selected for further investigation:

- Promotion of a town.
- Accentuating the location.
- Accentuating the importance of events.
- Popularisation of art.
- Façade as a display and information channel.

Findings: groups of subjects were selected, which might be used in creating social integration and regional marketing.

Research limitations/implications: The below research is of preliminary character. In next steps, other aspects could be added, e.g. multimedia technologies, or seeking means of expression, methods of building images.

Practical implications: The article presents the possibilities that multimedia systems offer in the area of message creation. It could potentially give direction to decision-makers with regard to their marketing activities, or the efforts to accentuate certain public functions of a town or region. The results of this research may interest investors, architects, and artists. The anticipated effect is that both awareness and the frequency of using multimedia systems will grow.

Social implications: The article discusses the questions of the social role of art and façade graphics in architecture. It examines the effects of a message contained in an image on the issues of social identity and developing bonds.

Originality/value: The study proves that façade graphics have a substantial impact, and it shows the possibilities of using such graphics in regional marketing; it also mentions their form, scope, and means.

Keywords: multimedia façade, contemporary architecture; theory of architecture; communication in architecture.

Category of the paper: Research paper.

1. Introduction

Multimedia façades have become an attractive way of drawing attention at scale. They allow creating for a huge number of potential viewers, increasing the target user group thanks to online broadcasts and mentions in the media. This group constitutes an interesting material for research. The purpose of such research is to determine the importance and the scope of the effects of a message contained in façade graphics. This research is of preliminary character. Based on example buildings, the author analysed the features that enable measuring the importance of art linked with architecture. Each of the buildings was examined in terms of its usefulness for shaping social awareness and integration; all in connection with creating the image of a region as well as building its brand.

The research was conducted on 15 buildings which have multimedia systems used in their façades. The research material was analysed, and groups of subjects were selected for further investigation:

- Promotion of a town.
- Accentuating the location.
- Accentuating the importance of international events.
- Popularisation of art.
- Façade as a display and information channel.

Selection criteria for the buildings referenced in the paper:

- Multimedia systems are used in the building's façade.
- The image discusses a subject belonging to one of the five categories.
- The research material covers public utility buildings.
- Use of various solutions in the technical systems.
- Completed within the past two decades.

Investigated issues relate to art integration in architecture. It was observed that messages in buildings are usually created using metaphors (Lipowicz-Budzyńska, 2022). The message is built based on the relationship of the image with the form and function of the building. Is it done similarly in the case of images included in a multimedia façade?

In each of the referenced buildings, the predominant factors that take part in creating the information were analysed:

- Those related to the building's form: shape, function, scale of the building.
- Multimedia image: image structure, artistic means, message method and type.

2. Multimedia systems in architecture

A multimedia image has a specific impact. Its reception is full after dusk or at night, when other, non-lit or poorly lit forms of art included in architecture — such as ceramics, murals, façade graphics on glass — are no longer visible. Many not properly lit buildings lose their attractiveness when the sun goes down, and only regain their significance the following morning.

Another huge advantage of multimedia façade systems is the possibility to use motion in the image to further attract attention of a potential viewer.

Additionally, a multimedia façade, through its scale and properties, can be viewed in three contexts (Lipowicz-Budzyńska, 2019): the urban context, the context of the building's façade, as well as — often — the interior. The scope of its visual impact and the direct contact between the graphics and the viewer makes it a perfect medium to create a message.

The message directed at the users and the building's surroundings may be used to generate or enhance social identity, and eventually to have a marketing purpose and become part of strategies for improving a given region's competitiveness.

The referenced research material and the below application examples provide a view of the diversity of forms in which multimedia systems appear in architecture. All of the examples listed below differ in terms of their objectives, relations with the surrounding space, ways of communicating, and applied artistic means, which can be used for marketing purposes, such as in creating image or brand for an institution, company, town or region.

2.1. Promotion of a place and town

One of the methods for regional marketing is the presentation of the town's progressive policies within key strategic areas.

The authorities emphasise how much they care for the environment, sustainability and building an environmentally-friendly society. It is important to provide positive messaging in the town (Figure 1A) around well-being, as well as support and strengthen tourist areas of the town and region. One of the ways of promoting town or region is stressing its openness to state-of-the-art technologies and data transfer. Such message has been incorporated into the *Indemann* multimedia installation (Figure 1B) located in Inden, Germany. The 50-metre high structure acts as a viewing platform, at the same time providing an emphasis for its location (Oosterhuis et al., 2006), and is used as a promotional tool for the region. Its form symbolises the important direction for the development of the town and region — with the emphasis put on the latest technologies but without detriment to human values. The reference to a human silhouette in the graphics is symbolic, and it shows the building's purpose that is linked to the environmentally-friendly policies of the town and region. The installation constitutes a kind of contemporary symbol of the town (Fernandez-Alvarez, 2022) and an element that people associate with the region.



Figure 1. Multimedia system as part of a landscape: A – Bonn skyline with the presentation of the Blinkenlights project shown on the building of the World Conference Center Bonn hotel in Germany. B – Indemann (Maurer United Architects, 2008) Inden, Germany.

Source: https://commons.wikimedia.org/wiki/File:Bonner_Skyline.jpg, Springfield911; photos by author.

In large cities or metropolises, it is common to use façade-enhancing techniques at night, and illuminate façades (Figure 2). Investors, in order to attract attention, surrender to a certain kind of pressure to use multimedia, and apply technologies that are becoming more and more elaborate and advanced. Due to how common these solutions are, and the presence of light smog, such efforts are sometimes ineffective. It is much easier and much more effective to apply this in façades in small or medium-sized urban areas.



Figure 2. The Hong Kong Island skyline, viewed from the Victoria Harbour waterfront.

Source: By Temppic at English Wikipedia - Transferred from en.wikipedia to Commons., Public Domain, <https://commons.wikimedia.org/w/index.php?curid=3063381>

2.2. Accentuating the location

The primary reason for using multimedia systems in the façade is to accentuate a location in a town. The majority of façades is activated at dusk, when the non-lit or poorly lit buildings are no longer visible. Companies in which recognition of the location is important like to use this medium on the buildings where they operate. It is particularly important for the premises of companies that remain open after dark, such as restaurants or shopping centres. Multimedia façades are associated with new technologies and luxury, which is why they are often used by branch offices of companies offering exclusive goods.

In sectors connected with tourism that offer their services to visitors who are unfamiliar with the town, it is very important to emphasise and accentuate the location (Figure 4A). The battle for the customer starts with attracting attention, and making an effort to stand out. Representatives of these sectors choose more active illuminations. The latest trend are interactive façades that change their visual properties depending on the weather, and that interact with the user of a given space (Figure 7A).



Figure 3. Multimedia systems at two competing car makers on the opposite sides of the road; Essen, Germany: A – Audi showroom, B – AMG Brand Center Essen.

Source: photos by author.

2.3. Accentuating the importance of international events

International sporting and other events, such as world championships, Olympic Games or Expo exhibitions, are accompanied by the appearance of new buildings. Frequently, these buildings use multimedia systems. The unique design of such buildings is often enhanced by top-class prototype systems. They are meant to stress the highest quality of the architecture, and show how important the event is. The appearance of such buildings is part of the promotional strategy of the event as well as the entire region. Using multimedia is not only good for attracting direct viewers of a given architectural space. Photographs showing the façades of such buildings can be found online, in literature, and in the media many years after the event has finished, and work brilliantly as a promotional material.

One of the examples is the Digital Beijing Building constructed in 2007. The building was erected as a data centre for the summer Olympic Games in 2008. The importance of this building is emphasized by the glass façade using geometric patterns associated with the structure of electronic circuits. It stands for advanced technologies and data processing. This 14-storey building is made up of four flat parts joined by enclosed pedestrian bridges made of glass. A three-colour palette is used in the geometrical façade: from green to yellow. The façade has been designed with both day and night viewing in mind. This results in a changed appearance of the elevation, depending on the time of day; both on the inside as well as outside of the building. The building is one of the most popular in Beijing. Its aesthetics are dominated by decorative graphics (ScoCCA, 2011) (Figure 4B).

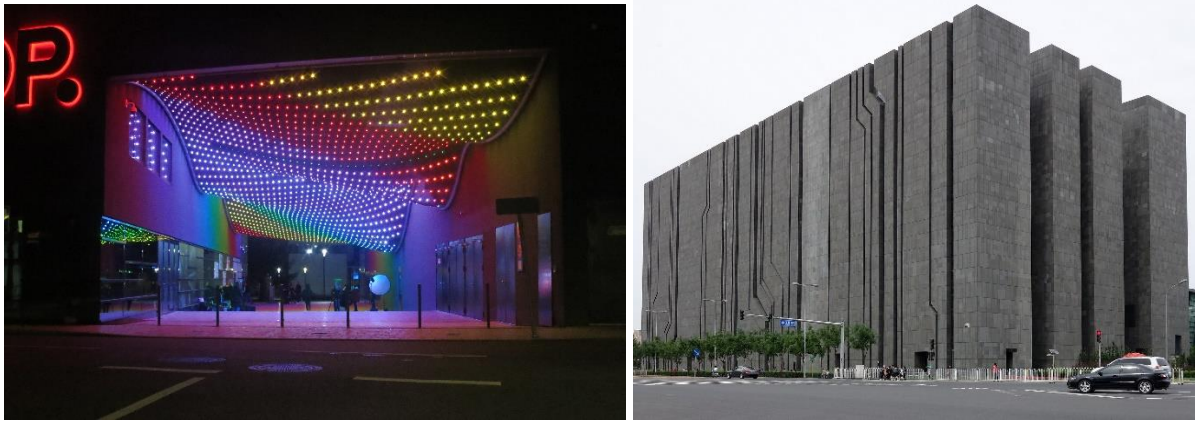


Figure 4. A – World Conference Center Bonn, an example of emphasising the location; a passage. Source: photos by author. B - Digital Beijing Building, (Pei Zhu, 2007) Beijing, China.

Source: By Bjoertvedt - Own work, CC BY-SA 4.0, <https://commons.wikimedia.org/w/index.php?curid=62289496>

One of the most interesting buildings remaining as the legacy of the Olympics is GREENPIX, Zero Energy Media Wall Lights (Simone Giostra & Partners and ARUP, 2008). It was built as part of the Xicui entertainment complex in Beijing, close to the venue of the 2008 Olympics. It is equipped with a multimedia system connected to a solar panel system. Throughout the day, the solar façade produces electricity, which is then used after dark for displaying multimedia presentations (Poulin, 2012). Even today the building is a symbol of high architectural standards, as well as ensuring sustainability and caring for the environment. The composition of the combined pane ensures thermal comfort, energy savings, and high efficiency.

2.4. Emphasising cultural functions/popularisation of art

The sense of shared culture and history plays an important role in developing social identity. For many societies, the popularisation of culture and art constitutes one of the priorities included in their development strategy.

Trends in modern architecture for the past two decades have seen such buildings being given a monumental treatment. Since 2000, numerous buildings with a cultural function have been designed all over the world. The remarkable appearance of these buildings is enhanced with the inclusion of multimedia systems in the façade. Examples of such an approach can be observed all over the world. Their location affects the surrounding area, as well as the whole town or region. One of the great examples is the *Kunstauss* building in Graz, Austria (Figure 5A).

The building was designed as part of the European Capital of Culture, which Graz became in 2003. The extraordinary structure of the building has been covered in its entirety with argon glass, and is equipped with LEDs in the shape of a torus that are adapted to multimedia presentations (Figure 5B). The façade acts as a screen on which artists may display their shows, and provides information to passers-by. The building is located in a run-down part of the town,

on the west side of the river Mur. The intention of the authorities was to activate this area. Locating a cultural building with strong articulation in this place has enabled the district to develop (Lindsay, 2020), thanks to frequent visits of modern art experts and lovers. Despite its controversial shape, the building has now been incorporated into the town's structure and accepted by the locals. Currently, it can be considered an icon of the town of Graz, something that the place is associated with (Dreher et al., 2020).



Figure 5. Kunsthaus (Peter Cook Petera Cook, Colin Fournier, 2006) Graz, Austria; A – A building in town. B – façade up close.

Source: Von photo taken by Georg Mittenecker - Eigenes Werk, CC BY-SA 2.5, <https://commons.wikimedia.org/w/index.php?curid=1068410>; Von Stephan Weinberger/Invisible in der Wikipedia auf Deutsch - Selbst fotografiert, CC BY-SA 3.0, <https://commons.wikimedia.org/w/index.php?curid=438407>

Another example is the Rockheim Museum (Figure 6), opened in 2010. The building in which the museum is housed is a converted grain store. The designers placed the main part of the museum within an orthogonal shape, on which they put glass and a monochromatic print. Under the glass, LED systems that activate at night have been installed. The architects' idea was to create a different identity of the building for the night time. Several years after opening, the Rockheim is fulfilling its original objective in full, becoming a sculpture-like object in the night-time skyline of the city. The project has been awarded the 2010 Best Construction Award by the city of Trondheim (Almaas, 2016).

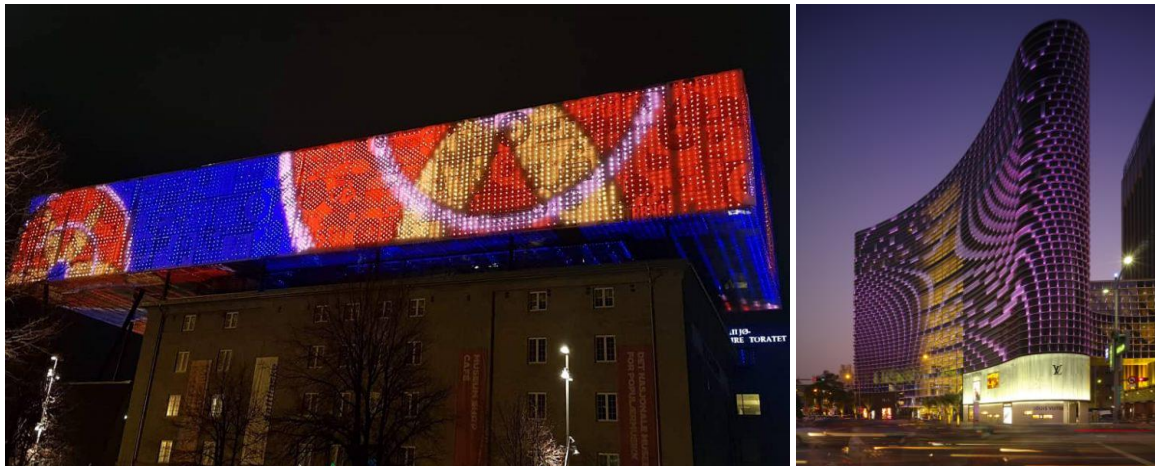


Figure 6. A – Rockheim Museum (Pir II Architect, 2010) Trondheim, Norway. Source: <https://kvener.no/lokallag/midt-norge/rockheim-museum-kvenfolkets-dag-2021/>, B - Star Place (UNStudio, 2008) Kaohsiung, Taiwan. Source: photo taken by Christian Richters <https://www.unstudio.com/en/page/11922/star-place-facade>

2.5 Façade as a display and an information channel

The main function of façade graphics is information. The message is communicated with various degrees of sophistication: from illuminations that catch the eye with changing colours (Figure 7), through pictograms that present simple messages (Figure 6B) or that are meant to evoke certain feelings or emotions (Figure 1A), simple presentations about human activity (Figure 6B), animal or plant motifs (Figure 6A), to looped clips containing a particular narrative. The subject of clips and presentations may be advertising, public announcements, showing solidarity with regard to global events, information on major events, festivals, or providing any information that is in the public interest.

A key aspect of presenting and creating the information or messages is the level of advancement of the multimedia images and the means of expression that are at the user's disposal depending on the adopted structure of the system.

An example of a multi-purpose use of a façade can be seen in Galleria Centercity (Unstudio, 2010) located in Cheonan, South Korea. The design broadens the functional aspect of the shopping centre and emphasises the meaning of social and cultural aspects in the public space (Uzun et al., 2020). It provides a place for social meetings as well as cultural events (Okur et al., 2019). The strategy used for the building exterior was meant to create an optical illusion. The elevation consists of two layers of aluminium profiles placed on the rear composite layer of aluminium cladding. The vertical profiles of the top layer are straight; but those from the back layer are put at an angle that shifts depending on the viewer's position. In the façade, a low- and high-definition multimedia system has also been installed. In daytime, the building is monochromatic; while at night, the waves of mutually permeable colours begin to rise. The high resolution of the multimedia system in the façade enables displaying figurative images with more details. The displayed animations show subjects related to the shopping centre (Galleria Centercity, 2010). They concern current events, fashion, art or public life.

The building has a double visual identity: in the day, it is monochromatic and shows moiré patterns, and at night the light projections make the vertical posts disappear, and changing colours appear on the façade.



Figure 7. Galleria Centercity (Unstudio, 2010) Cheonan, Korea: A – The façade at night; B – A piece of the façade in daytime, moiré patterns.

Source: photo taken by Kim Yong-Kwan, <https://www.unstudio.com/en/page/12104/galleria-centercity>

3. Discussion

In the research material, three different types of imaging and messaging were observed:

- Simple single-colour image composed of illuminated pixels.
- A monochromatic image consisting of a raster, where LEDs are used as individual units.
- Coloured surface image.
- Graphically advanced coloured image.

Table 1.

The combination of elements that influence the creation of the messaging in the analysed research material

Item	Image structure	Artistic possibilities and available means of expression	How the messaging is built	Type of messaging
1	Pictogram	Sequentially moving image, a type of compositional game, containing figural elements in the form of pictograms	A narrative made up of several pictogram components; Built based on associations	Refers to the basic human needs and forms of activity; manifests solidarity, emotions and feelings. Multimedia presentations
2	Monochromatic image built of a raster	Moving image built of a single-colour raster	A narrative composed of simple moving elements, built based on simple associations, often contains lettering and graphic symbols, metaphors	Related to forms of human activity; associations with emotions and feelings. Multimedia presentations

Cont. table 1.

3	Surface image, coloured	Surface image, usually tonally changing colour transitions	Multicolour abstract image, or consisting of one colour transitioning into another	None Or colours are given specific meanings
4	Advanced coloured image	Moving image, coloured, usually built of a fine raster	A narrative made of a moving, realistically reproduced image. Usually the messaging is built in a literal way. Metaphors are rarely applied; in artistic multimedia presentations, often linked with the building's shape.	Multimedia presentations, broadcasts, displaying works of art, advertising

Source: own study.

The above list shows that each of the different methods of presenting information with the use of multimedia systems has its own specific ways of forming the image as well as the messaging. Using primitive image creation methods, such as pictograms or single-colour raster images, enables the author to produce equally effective messaging. This is done through creating metaphors in the images. They are used for presentations that are artistic in their character. More technologically advanced systems, which allow accurate recreation of a multi-coloured reality, can be used to create messaging in a more literal and direct way. They are more versatile, and thus frequently used in commercial or advertising presentations.

4. Summary

The above research shows a great diversity in terms of the possibilities for the application of multimedia systems in architecture. It confirms the significant part that multimedia façades play in regional marketing.

Moving multimedia images have a decorative function; they add dynamics to and illuminate the façade; they can be used to present even complex narratives; and they enable interaction with the surroundings. The large extent of the visual impact of the graphics, and the direct contact between the graphics and the viewer, make a visually moving image a perfect medium to create a message. A façade can be used to build or strengthen social identity. The messaging will be greatly affected by the form and means of expression, as well as the use of specific metaphors.

In the research material referenced in the article, various strategies for using façade graphics in the creation of regional marketing were noted. It was observed that the façade may carry content which supports generating or enhancing social integration.

Visual features, the information presented in the façade, or direct messaging may all be useful for the purposes of regional marketing; and they are linked with the following subjects:

- **Promotion of a town.** A stand-alone multimedia structure, located in the open air, has the greatest impact. At dusk and at night, it is visible even from a couple of dozen miles away; it might be used for branding or creating identity for a place. Even simple multimedia façades are effective in small and medium-sized towns. In large cities, due to the prevalence of such solutions, usually only the more advanced façades are going to be effective. They produce an image of a region, linked with the use of the latest trends of caring for the environment and being open to environmentally-friendly solutions and technologies.
- **Promotion of a place and town** is connected with visual factors resulting from an illuminated image being created, which after dark becomes an attractive surface that acts as an ornament, constitutes a composition, and provides a channel for messaging. The information presented in the façade influences the identity of a building and its image. The most common reason for using such façades is advertising combined with branding, which might be used to create an image of a neighbourhood or the whole town.
- **Accentuating the importance of international events** has a high marketing value. It is connected with creating a positive image and referencing the latest trends. International cultural or sporting events remain in the social memory for long time, and provide an excellent promotional opportunity. Multimedia structures used for this type of activity promote the town and region not only in a direct way, but also for many years to come after the event has finished. The messages about such events are kept on websites and in social media for a very long time. An image included in a multimedia façade emphasises the region's openness to international contacts, and may encourage development of new relations in various branches of economy.
- **Emphasising cultural functions** has a significant potential in terms of integration and marketing. Location in the right place may activate the urban space. Placing multimedia façades in buildings of this kind helps in this respect. The transformational effect is not only significant in local terms, but has a larger, urban context. Such actions are particularly important in suburban and run-down areas.
- **Façade as a display and information channel** — in many cases all over the world, digital façades become the very identity of the building, where they are used for making public announcements, showing solidarity with regard to global events, informing about festivals, or simply providing any information that is in the public interest. A narrative created in a multimedia image may be one of the best tools available for generating mass awareness. Although digital façades may, at the same time, act as the illumination for the elevation, or as a work of art, or advertising space — they provide an unprecedented opportunity for a visual refurbishment of many buildings. Using multimedia façades has its own dangers too, and should be done with care. The reason for this is the light smog it produces that poses a health risk. Therefore, I believe that the application of such solutions should be controlled and closely linked to the strategy of the city and region.

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