

Mapping The Actual-Virtual in Architecture Exhibition

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Abstract

Background This study aims to identify, map, and reflect on actual-virtual relations in architectural design practices. Virtuality is more than just a discourse of technology. Virtuality is an attempt to realize unlimited possibilities. This study uses the context of the Venice Architecture Biennale (2021) exhibition with the theme 'How Will We Live Together?' to illustrate various possibilities of space construction through the actual-virtual framework.

Methods The identification of actual-virtual is performed by qualitatively decomposing the case studies of 60 pavilions. The analysis is carried out by drawing and retracing the data for each pavilion to discover various actual-virtual instruments, operations, and relations in the exhibition. Reflection on the actual-virtual concept that traverses multiple dimensions of space and time, becomes the basis for seeing actual-virtual as a potential.

Results This study reveals various types of actual-virtual operations and relations in the context of architectural exhibitions. The connection between origin and execution in exhibitions parallels the actual-virtual relational framework. Disassembling the case study also demonstrates the actual-virtual possibility as a design instrument that connects multidimensional space and time.

Conclusions This study offers to deliver another perspective on actual-virtual relations in architecture. This study expands the actual-virtual abstract and conceptual discourse into more practical and operative perspectives. The findings demonstrate the possibility of broadening design knowledge based on an actual-virtual relational framework in an architectural context.

Keywords Actual-Virtual, Relations, Spatial Operations, Exhibition, Multidimensions

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1. Introduction

1. 1. Actual–Virtual as Relational Entities

‘The relationship between the virtual and the actual is one of surprise, for the virtual promises something different to the actual that it produces, and always contains in it the potential for something other than the actual’ (Grosz, 2001, p. 11).

This study adopts a conceptual idea from Elizabeth Grosz (2001), who states that the actual and the virtual are interrelated and have the potential to present something more than the actual itself. The idea of actual-virtual has been widely discussed as an abstract thought. However, the practical design perspective discussion is still lacking compared to the technological perspective. Virtuality is not limited to digital design approaches but also the actual processes that materialize the virtual (Jecu, 2015; Kalaga, 2003). Identifying the interrelated instruments in the spatial context can reflect the actual-virtual relational concept.

Actual-virtual presents a relational idea of multiplicities. There is no pure actual object, and a relative virtual image always comes with it (Deleuze & Parnet, 2007; Grosz, 2001). Discussing multiplicity in architecture means opening up the possibility of alterations in meaning, experience, and practice (Paramita, 2022). Actual-virtual in this study is proposed and identified as a relational idea that is more than just an abstract thought but as the potential to be reflected in the development of the spatial design practice.

1. 2. Actual–Virtual Relation on Exhibition Spatial Practice

Architectural exhibitions are contextual media of spatial practice to discover the actual-virtual. Architecture exhibitions curate and reflect on ideas, possibilities, and thinking across disciplines, which open the boundaries of architecture beyond buildings (Bondesan, 2022; Brown & Szacka, 2019; Szacka, 2016). The exhibition's design and spatial response to various issues present a new reality, a parallel virtual model related to the future (Lee, 2015; Nash et al., 2021). The concept of parallel space relates two things in the context of the exhibition: the idea as the origin of the exhibition and the spatial translation as the execution of how the idea is implemented and constructed in the exhibition design.

Reading the relational origin and execution in the exhibition can reflect the actual-virtual relation. Virtual is not a separate reality but a new perspective on actual conditions (Jecu, 2015). Fantasy and creativity are not limited to conditions and situations but also imagination, representation, and virtuality (Papasarantou, 2020). Based on those arguments, we can say origin can be divided into two characters. Origin or ideas originating from a real situation are called the actual. On the other side, imaginative notions or conceptual ideas, which have yet to materialize, are called the virtual.

Meanwhile, execution relates to the realization of ideas. In the context of exhibitions, actual means original artifacts, while virtual means representation of something outside of it or something artificial (Gay, 2001; Levy et al., 2010). Virtuality is always around us, accessible through spatial and material portals, mediated by memory and imagination (Kalaga, 2003). Based on those arguments, the execution can be divided into two characters. Execution that uses the original artifact can be called the actual. In contrast, execution assisted by artificial recreations in various forms and scales can be called the virtual. The scope of origin and execution and their position in the actual-virtual relational diagram is illustrated in Figure 1.

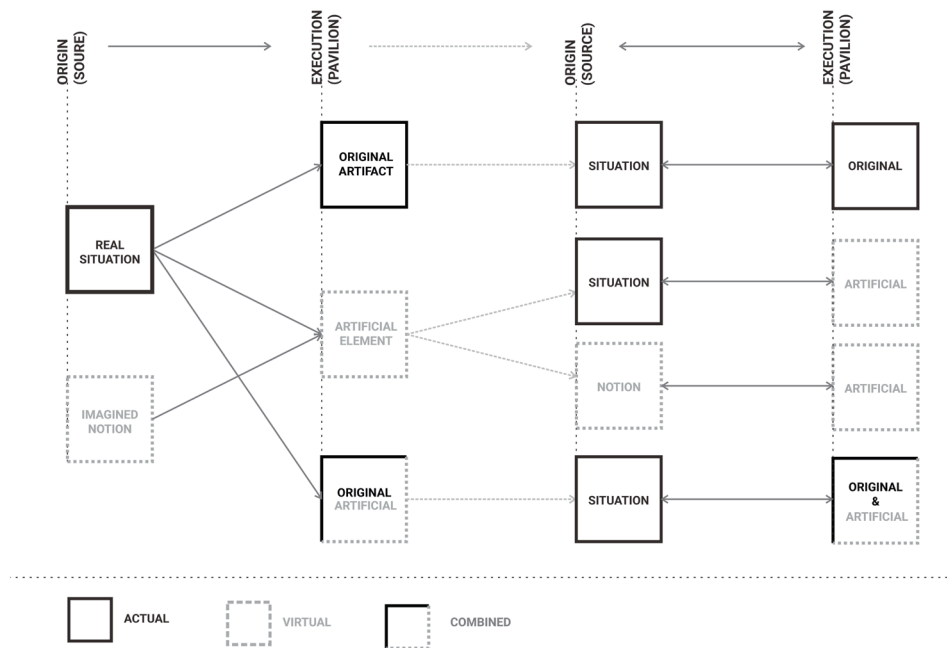


Figure 1 Actual–virtual relation and definition concept in exhibition practice

Spatial operation in an exhibition is translated into a representation of something that is time and space limited. Architectural exhibitions perform beyond the objects and physical presence. Actual-virtual presents a discussion of spatial design that is related to representation and substitution (Virilio & Ruby, 1998; Virilio & Wilson, 1994). It represents various contexts within limitations through representational techniques of an indirect dimensional and immersive model (Atmodiwirjo & Yatmo, 2020; Brown & Szacka, 2019; Francis, 2015; Zizek, 1996).

Multiple strategies and operations related to actual-virtual in the exhibition have the potential to open up various design approaches. The Venice Architecture Biennale (VAB) can become a contextual case study, especially the exhibition of national pavilions from various countries. VAB can reflect current global conditions, demonstrating the exchange of technological and material knowledge, as well as multi-context and locality interactions that blend boundaries (Martini, 2010). The conceptual architecture presented at the exhibition demonstrates various forms of creativity through the collection, representation, and organization of various things to understand this world (Betsky, 2005; Cull, 2015; Dudley, 2019). VAB 2021 comes with the theme of how living space in the future is conceptualized (Sarkis, 2019). With the global pandemic conditions bringing humans closer to virtual concepts (Sarkis et al., 2021), this exhibition becomes a suitable case study to reveal new perspectives from actual-virtual relations in spatial practice.

1. 3. Actual–Virtual of Multidimensional Space

Reading actual-virtual as a spatial relation and operation allows modification and alteration of multidimensional aspects. Virtuality can modify the understanding of time and space (Clear, 2011; Crang, 2001). Multiverse is a concept in which different spaces, locations, and times can have the same conditions and design solutions (Deutsch, 2005; Flachbart & Weibel,

2005; Jordan, 2009). Architectural exhibitions operate like parallel portal worlds, connecting actual conditions in virtual models in the exhibition space. The virtual perspective posits the past, present, and future simultaneously, where there is no clear concept of time, running parallel and coexisting (Hernan & Ramirez-Figueroa, 2021; Kalaga, 2003). Multidimensional ideas can enrich the experience of space into wider virtuality.

Actual-virtual is not only able to extend multi-dimensional time but also the scale of space. An exhibition is a mixed reality that blends scale and detail and duplicates actual space in experiential virtual entities and models (Caldas & Keshavarzi, 2019; Downey, 2014; Graham et al., 2019; Till, 2006). The dynamics of scale and time, and the multi-dimensional aspect that it can represent, is the potential contained in understanding the actual-virtual in exhibition practice. This study identifies and maps the actual-virtual relation in exhibition practice to expand the spatial design approach.

2. Method

This study is conducted through a qualitative approach using case studies of disassembling of the national pavilion at VAB 2021, dismantled to find actual-virtual instruments, including operations, relationships, and dynamics within them. The data is collected from the official VAB website in the form of photos, videos, and narrations from the curators of each pavilion. The analysis uses the redrawing and tracing method of 60 pavilions from national participants. Drawing can be an investigation and analysis tool (Carpo & Lemerle, 2013; Cook, 2013), and tracing is a method for understanding what is hidden in it. Visual image-based research methods refer to the activity of copying operations (interrogation and composition), collaboration (dialogue), image attention (understanding phenomena), and orthographic projection (materiality and form) (Lucas, 2016). 'The virtual is a projected form of the present, relocating it to the future, and to alterity' (Lucas, 2019, p. 171). This study aims to identify and map the actual-virtual aspect of the relations, operations, and spatial dynamics that occur in it. These results reflect a new perspective on actual-virtual expansion in developing architectural design approaches. Figure 2 demonstrates the flow of analysis in this study.

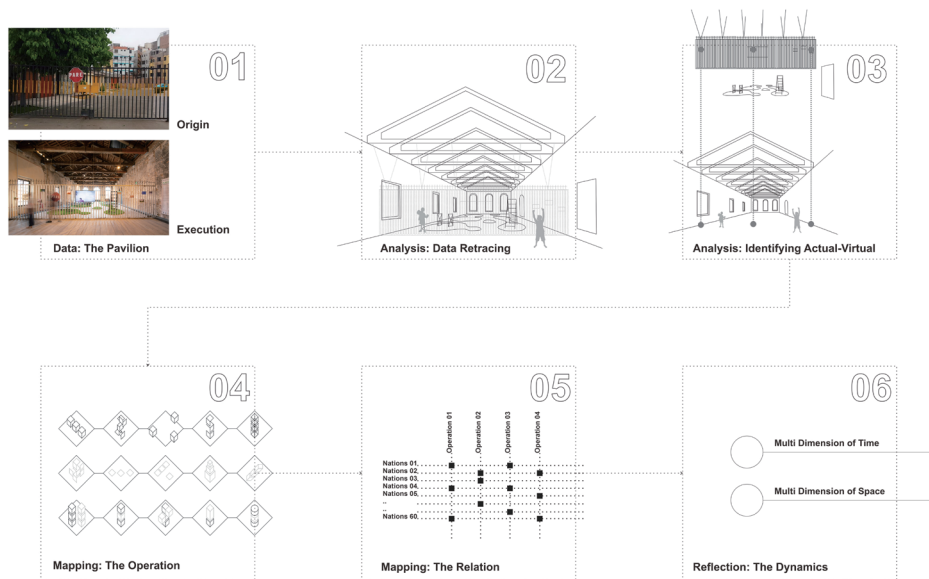


Figure 2 Qualitative case studies as a framework of exhibition spatial study

3. Result

3. 1. The Operation: Re-creation of actual-virtual spatiality

Operations in this study include the design and spatial strategy carried out by each pavilion to translate ideas from origin to execution on the exhibition venue. Based on the actual-virtual conditions of the origin from 60 national pavilions, it can be identified that execution operations are using original artifacts, artificial instruments, and a combination of both. The first category, using only original (actual) artifacts, is performed by compiling, distorting, changing the layout, breaking up fragments, and structuring. The second category, using artificial (virtual) instruments, is performed by re-creating through abstracting, mapping, projecting into a medium, scalable modeling, and visualizing through various media, photos, audio, and video. The last category combines original artifacts and artificial instruments (actual & virtual), carried out using augmentation techniques, composing, grafting, and transforming forms. Each operation is illustrated as shown in figure 3.

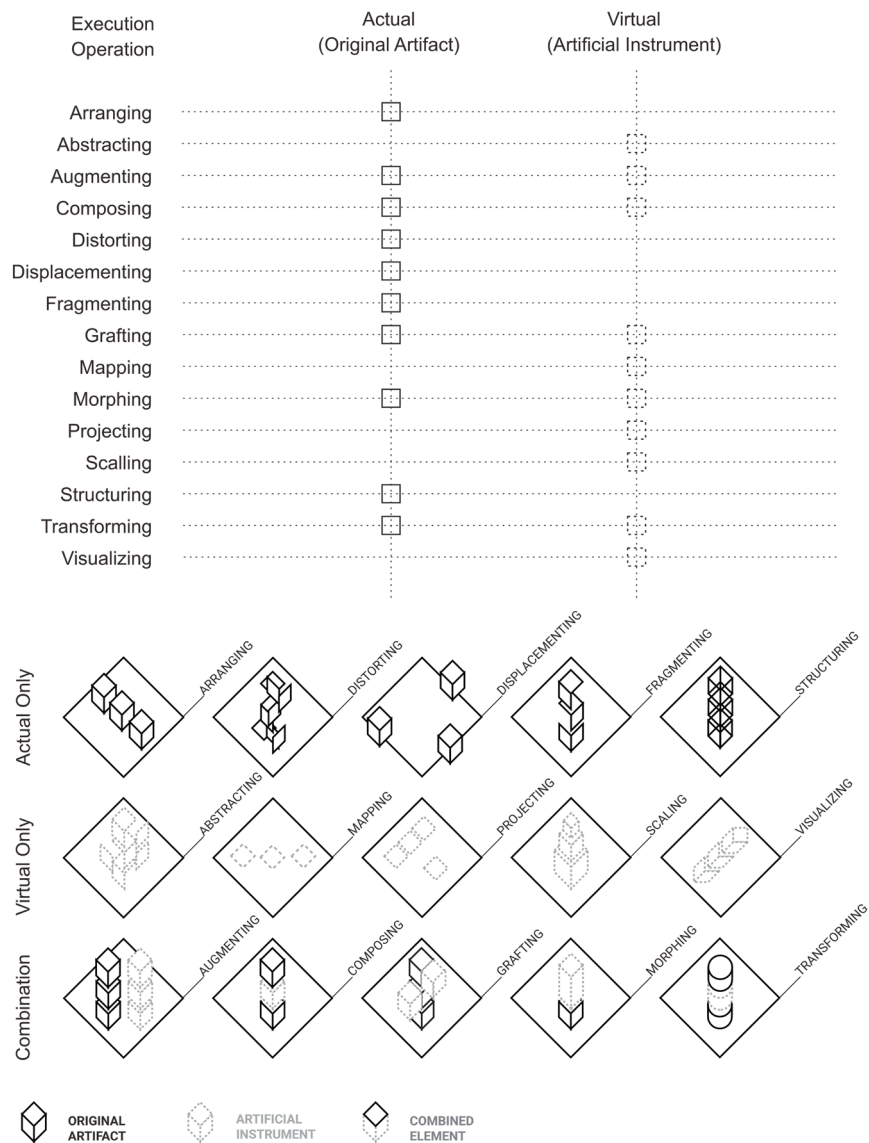


Figure 3 Execution operation translates origin into design execution

3. 2. The Relation: Reconciliation of actual–virtual connection

This study generally examines the possible relationships in exhibitions by identifying the connections between origin and execution. According to the exploration, the relationship between the two can be reflected in the actual-virtual character. The origin or source of design can be classified into two categories: real situation or (actual) origin and imaginative (virtual) origin. Execution or implementation in the pavilion is also classified into two categories, namely execution using original (actual) artifacts and artificial (virtual) instruments as a translation of the initial idea. Figure 4 demonstrates the relationship between origin and execution from an actual-virtual perspective from the 60 pavilions of VAB 2021.

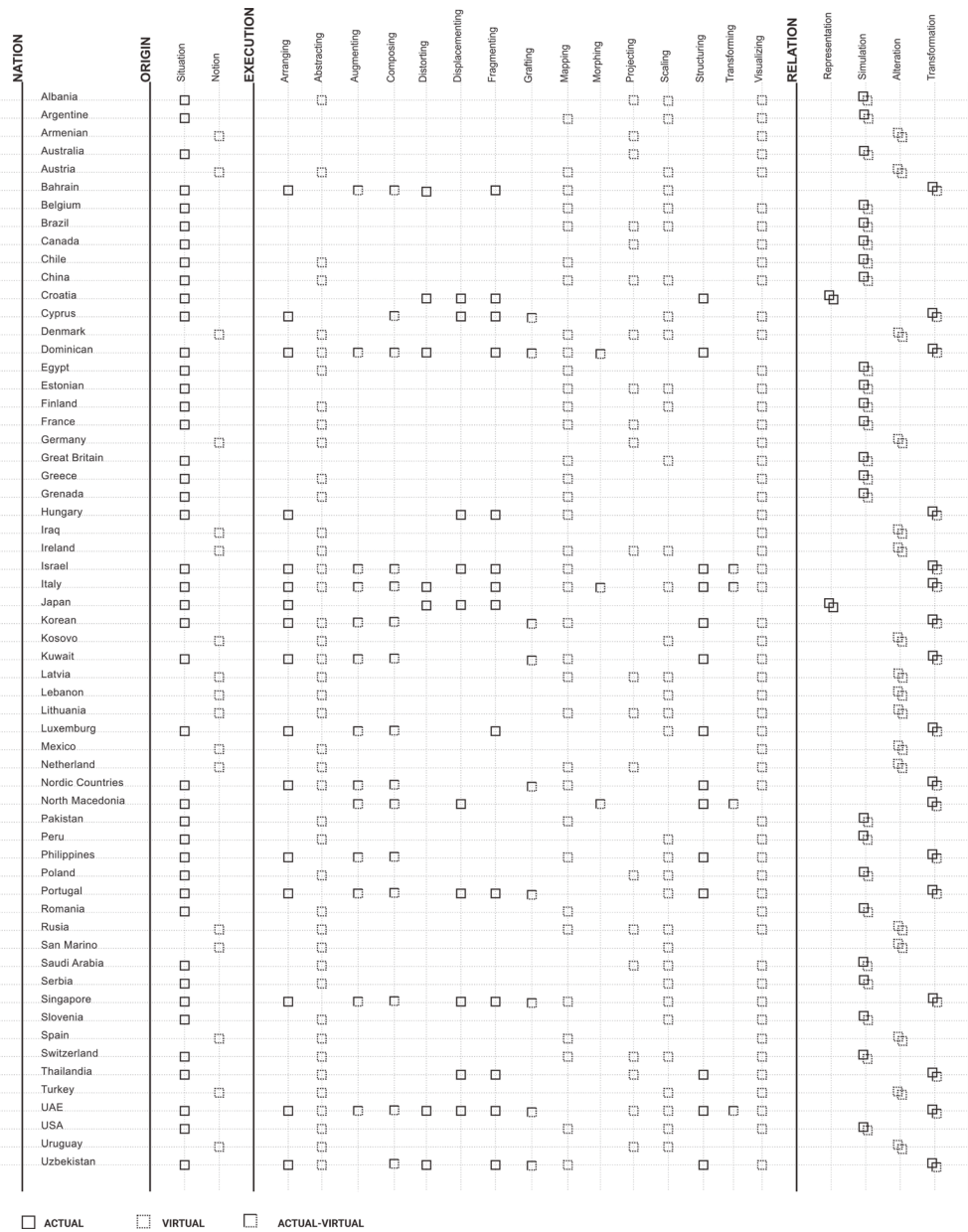


Figure 4 Mapping of origin, execution and the relation between

According to the mapping in Figure 4, four possible relationships are formed between origin and execution in their respective actual-virtual viewpoints. The origin-execution relation above includes the actual-actual (representation), actual-virtual (simulation), virtual-virtual (alteration), and actual-actual & virtual (transformation) categories.

3. 2. 1. Representation (actual origin – actual execution)

The first relationship between origin-execution in VAB 2021 is the representation (actual-actual). Representation means objects that are not entirely, only partially (Arya, 2019; Whyte, 2007), and are projections of the most significant fragments (Beckmann, 1998; Grosz, 2001). Representational relations are well illustrated through the Croatia and Japan

pavilion. The Croatia pavilion brings togetherness through building fragments of the original building from the country to the exhibition venue in Venice. The Japan pavilion did performs quite similarly, bringing the trajectories of construction elements, primarily the wooden sub structures, from the country. This partial fragment representation demonstrates the actual-actual relation in the context of origin and execution of the exhibition, as illustrated in Figure 5.

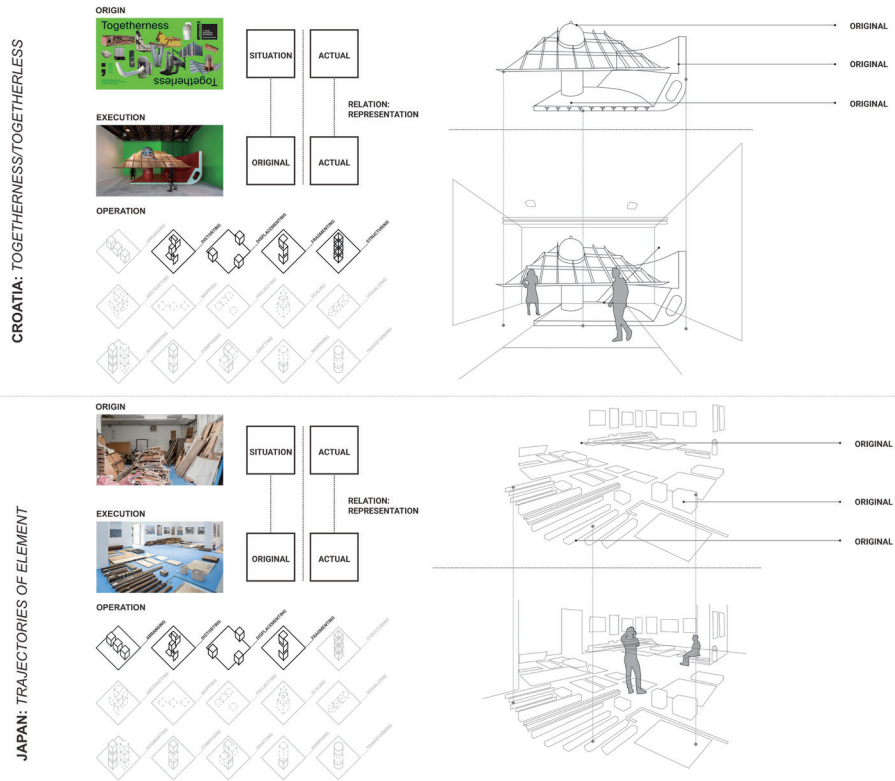


Figure 5 Representation relation, connecting actual origin and actual execution

3. 2. 2. Simulation (actual origin – virtual execution)

The relationship between origin-execution in the second VAB 2021 is a simulation (actual-virtual). Simulation has an understanding that is not limited to imitation, but there are modifications in reality (Jecu, 2010). The simulation also means dematerialization, not merely re-transcription, a copy of reality with an emphasis on certain conditions, which enriches a piece of information (Grosz, 2001; Whyte, 2007). Simulation is part of shaping the experience, as well as enriching representation (Eloy, 2022; Miltiadis, 2020). These arguments reinforce that simulation means that it is not only a reflection of the actual condition but also modifications and additions of information, which focuses on dematerialization. It is also understandable that there are attempts to make interpretations completely artificial (virtual) without any original objects (actual). Simulation relations are well illustrated through the Albanian and Belgian pavilions. The Albanian pavilion presents the idea of communal space in the domestic space through the dematerialization of various domestic instruments. They used this spatial concept to highlight the shared space in their domestic housing. Like Albania, which does not present actual objects, The Belgium pavilion

tries to answer the theme by presenting togetherness through reduced-scale city figures or urban fabrics. There are no actual or original objects in the two pavilions; both focus on artificial (virtual) objects so that they can present the conditioning of large objects in a limited exhibition space. This simulation of information and conditions demonstrates actual-virtual relations in the context of origin and execution of the exhibition, as illustrated in Figure 6.



Figure 6 Simulation relations, connecting the actual origin and virtual execution

3. 2. 3. Alteration (virtual origin – virtual execution)

The third relationship between origin-execution in VAB 2021 is an alteration (virtual-virtual). Alteration can be interpreted as a change from the original reference condition or object, which leads to a change in a particular variation (Jecu, 2010; Massumi, 1998). The alteration also means a conceptual rearrangement of the schema, free from the attachment of certain constraints (Grosz, 2001; Miltiadis, 2020). The relation of alteration is well illustrated through the Austrian and Irish pavilions. These two countries base their pavilion inspiration on something other than actual conditions that already exist and occur but rather lead to the imagination of a particular idea. The Austria pavilion is trying to rethink the concept of a digital platform as an interaction space. The interpretation translation of this idea is to bring the elements of the digital platform into the physical space. The alteration that occurs is a change in the digital platform from the virtual world to the physical world. Meanwhile, The Ireland pavilion has a similar approach. The Ireland pavilion tries to re-understand the space that is constructed from the idea of digital devices. In contrast to platform-focused Austria, Ireland is trying to alter technology hardware into shared living space construction. There is

no actual interpretation, and inspiration also comes from ideas that have not been realized before, namely altering digital space and technological, mechanical devices as physical space. This alteration of digital hardware and software demonstrates virtual-virtual relationships in the context of origin and execution of the exhibition, as illustrated in Figure 7.

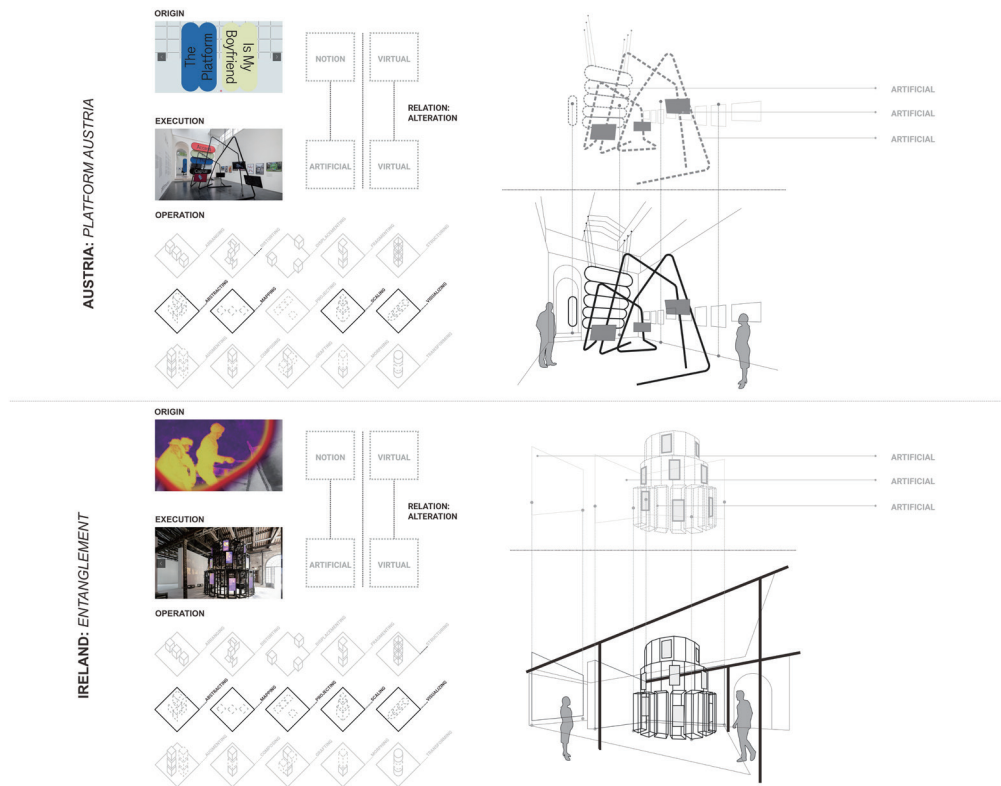


Figure 7 Alteration relation, connecting virtual origin and virtual execution

3. 2. 4. Transformation (actual origin – combined execution)

The relationship between origin-execution in the last VAB 2021 is the transformation (actual-actual&virtual). Transformation is a change process through negotiation between the actual and the virtual, both in the form of augmentation and supplementation (Grosz, 2001). We can achieve transformation through connection and dialogue between actual-virtual in the reconstruction of the potential of an object (Ruberto, 2021). Transformation and alteration have a close understanding, namely the emergence of new configurations. Still, the difference is that alteration describes the variation of conditions, while transformation is the process (Massumi, 1998). We can understand the transformation of an object through connection-based explanation and dialogue with its environment (Iser et al., 1998). Transformational relations are well illustrated through the UAE and Singapore pavilions. The UAE pavilion demonstrates inspiration in the form of actual objects, namely natural objects, combined with actual-virtual combination interpretations with videos and illustrations of future living spaces of these natural objects. There is a change or transformation of natural objects into instruments of space construction. The Singapore pavilion does not construct a new space but interprets social space differently from the actual-virtual combination of object interpretation. Table and chair objects are combined with virtual instruments through

illustrations, scale models, and videos of shared space ideas. The two pavilions carefully look at the opportunity for the combination of interpretations of their original (actual) artifact to be constructed differently through their combination with artificial (actual-virtual) instruments. The transformation of the original (actual) artifact occurs through new combinations with artificial (actual-virtual) elements, as illustrated in Figure 8.

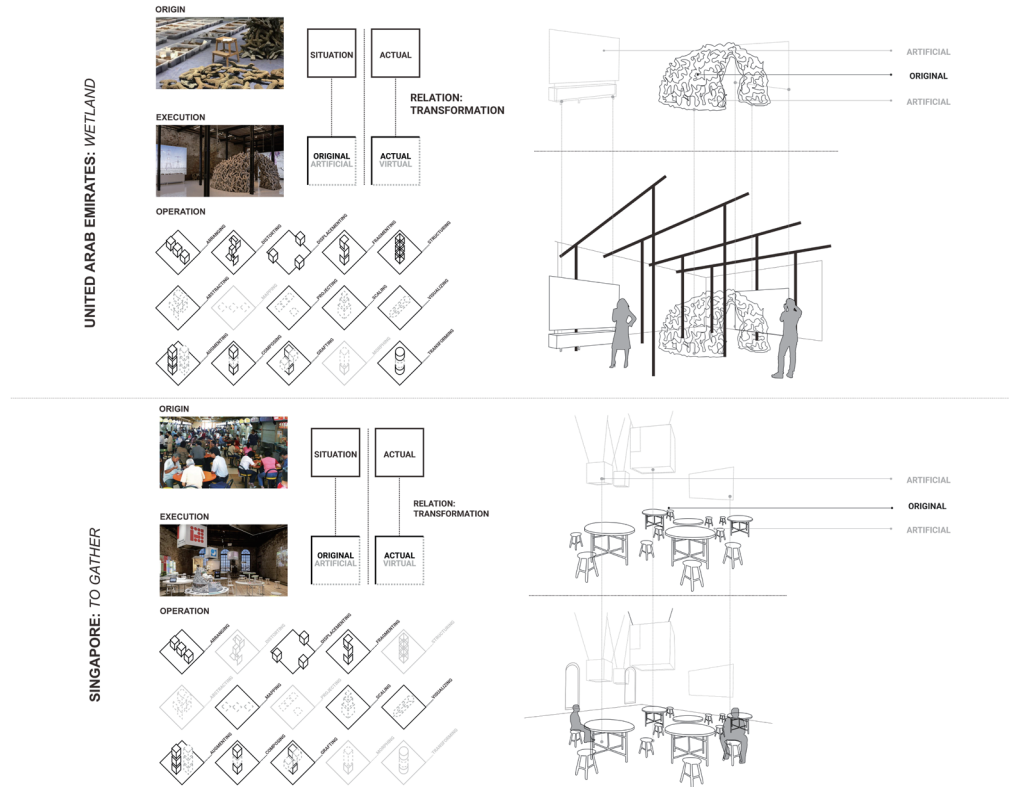


Figure 8 The transformation relation, connecting the actual origin and execution of the actual virtual combinations

If reflected in the study framework at the beginning of the article, the operations and relations in the VAB 2021 exhibition have the appropriate position, as demonstrated in figure 9. Actual-virtual spatial operations allow translation from origin to design execution in the pavilion. The possibility of actual, virtual, or a combination of both operations makes designer creativity more open. The actual-virtual relation is the connection between origin and execution, where there are four types of possible connection/relation.

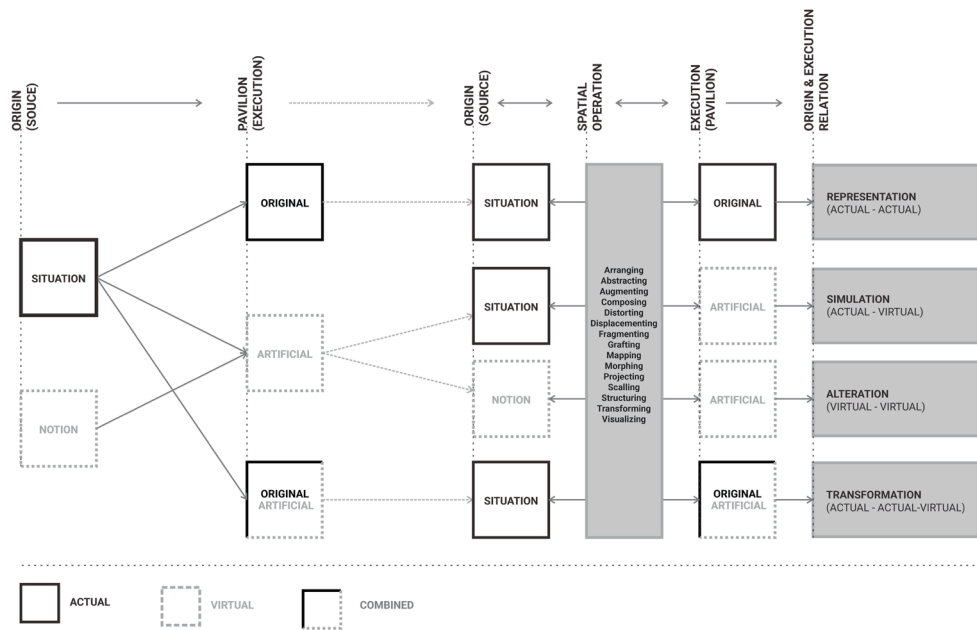


Figure 9 Actual–virtual relations and operations in the context of an architectural exhibition

3. 3. The Dynamics: Multi dimensionality of actual–virtual time and space

Through the exploration above, actual-virtual operation and relation have the potential to connect multi-dimensions, both in space and time. Virtuality can modify the present conception of the time and space dimension (Clear, 2011; Crang, 2001). The multiverse concept, where different spaces, locations, and times have similar conditions (Flachbart & Weibel, 2005; Jordan, 2009) also demonstrated through various pavilions. The connection of multiple dimension of time and space, also related to particular spatial operation.

Based on the time dimension, actual-virtual can be a potential instrument to create past-present-future interactions. Time in the exhibition concept becomes a narrative instrument that is different from real-time (Nathania & Wahid, 2022). The time portal opens through exhibit objects with virtual entities traversing the periods. Speculation of future space can be constructed by re-reading the past and the present from the perspective of an evolutive context (Spiller, 2020). Based on the idea of past time, the USA pavilion uses architectural instruments from the past to be reinterpreted in constructing shared spaces in the future. In the concept of the present time, the Brazil pavilion demonstrates the redefinition of urban areas for possible future spaces. Meanwhile, from a future perspective, the Latvian pavilion shows the possibility of machine integration in human living space. These three illustrations support the argument that in spatial construction, opportunities are expanded through objects with virtual entities that are wider than themselves. Actual and combined actual-virtual operations can strengthen space design's concept of past and present times. In contrast, the idea of future time can only be supported with the intensive use of virtual operation.

Based on the dimensions of space, actual-virtual can be a potential instrument for presenting a more dynamic spatial experience. Exhibition space can be positioned as a virtual model duplicating the actual space configuration in freedom of scale (Till, 2006). The exhibition

object is a portal that can open the same virtual entity, more minor or even more significant than the actual spatial dimension (Kalaga, 2003). The Japanese pavilion demonstrated the smallest building instrument, which uses building demolition material to create an exhibition space. The Croatia pavilion tried to use building instruments like roofs and walls to reconstruct a new exhibition space on an accurate scale. The Belgium pavilion became an enormous scale demonstration by presenting a scale model of their urban fabric to interpret shared space from a macro scale. The three pavilions show the possibility of experiencing space with virtual entities, which can be smaller or much larger than the actual objects in the exhibition. Figure 10 presents the dynamic multidimensional possibilities in the exhibition's concept of space and time.



Figure 10 Actual-virtual relations that connect the multidimensional

4. Reflection

Several things related to design and research practice can be reflected based on the studies of the exhibition actual-virtual framework. From practical design perspective, the actual-virtual relation can be used as a reference for the representation mechanism of design instruments, where virtuality opens opportunities for alternative creative representation. Various artificial instruments can expand the limited presence of physical or original instruments in the design. They can also be a collaboration of digital/technological virtual entities in forming an experience based on the similarity of the instruments attributes. In a broader scope, this mechanism is not limited to exhibition practices and can be expanded to other spatial-based design practices.

From the design research perspective, actual-virtual relations can be a paradigm in reading the spatial operations of particular space. The spatiality is not only found at the exhibition but also in various other spatial practice and phenomena. Mapping the actual-virtual relation

framework (framework level) can disassemble other relational representations in design cases. By considering the actual-virtual relations, we can position design knowledge as an extension of seeing spatial medium as more than a single entity. The virtuality paradigm as an ideal image, opens opportunities to study spatial designs from various dimensions (spatial imagination, technology representation, augmented visualization, etc.).

5. Conclusion

The results of the identification and actual-virtual relational mapping regarding the VAB 2021 national pavilion demonstrate that actual-virtual discourse is not limited to conceptual, thinking, and technological. The new perspective regarding actual-virtual as a relation and operation shows the possibility of expanding spatial design into more varied dynamics.

In the discussion of actual-virtual space dynamics, space is capable of presenting experiences in accordance with what is seen directly, and architectural instruments work like a portal. Existing portals can connect various virtual entities that the designer can creatively define. Virtuality is not a separate reality but a new perspective on actual conditions. Virtuality can be read as an opportunity and possibility to bring vision and imagination closer together in a more operative and practical way.

This study may only be a small part of actual-virtual exploration in architecture. Case studies limited to the VAB 2021 national pavilions are also an opportunity for further, broader, in-depth future studies. Nevertheless, this study offers a new perspective on actual-virtual relations in architecture that opens up different opportunities to develop spatial design practices that respond to multiple and various issues.

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