

Study of Alvaro Siza's 'U Type' Architectural Thought and Its Operational Mechanism

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Abstract. This study aims at combing several clues of the source of 'U Type' in Siza's architecture, analyzing the 'duality' of 'U Type' to reveal the reason why Siza chose 'U Type' as prototype in the appropriate contexts, and discussing the operational mechanism how 'U type' approaches or transforms to reality from three levels: group differentiation of 'big U type', monomer deformation of 'small U type', and composition of multiple 'U type'. This paper points out that Siza's 'U Type' is the result of the comprehensive transformation of diverse factors, such as Portuguese courtyard residence tradition, Nordic Scandinavian organic architectural culture, Le Corbusier's architectural heritage, and traditional basilica's A-B-A spatial form. As a prototype that contains multiple 'duality' which is also degenerative, 'U Type' shows the significance of 'Universality', this is why Siza repeatedly used 'U type' to intervene on reality. In the relatively empty or bad context with the absence of the 'root of the city', 'U Type' resets the starting point, absorbs the site with its concave semi-open form, and transforms from closed to open, from simple to complex, from rational to poetic (reality) through a series of operations such as 'differentiation and connection, deformation and growth, composition and adjustment' which is to respond the problem of reality.

1. Introduction

'U Type', the theme that was used repeatedly by Siza, is almost throughout his whole architect career. From the early Carlos Ramos Pavilion (Figure 1) to the recent Shihlien Chemical Industrial Jiangsu in China (Figure 2), what does U type mean to Siza in his 60 years of practice?

For Siza, the city, the architecture, and all the elements included in architecture are all results of the comprehensive creation of reality and memory ^[1]. As an architect, he not only concerns how the 'seeds' of the past (such as 'root of the city' ^[2])) grow into the present state, but also how to take part in the transformation of their future through design. Siza seems to establish a continuous and spontaneous evolution paradigm of the 'past-present-future', and to minimize the role of architect as much as possible. As he said, 'my intention is to regain the spontaneity that has been lost, to benefit from spontaneity and diversity, and the fascinating creative change is the intermediate state between questioning and pursuing to the reality, which is the state of constant extinction and rebirth that we have created constantly.'^[3]

Then, if we bring U type into this continuous paradigm, it will lead to three successive questions: 1. Where did the U type come from? 2. Why did Siza repeatedly choose U type as a prototype to intervene the contexts? 3. When the abstract U type becomes a starting point, what operational



mechanism could be used to return to reality? ('return to reality' is what Siza said 'the transformation process that language adapts to reality' [4].)



Figure 1. Carlos Ramos Pavilion(1985-1986)
(photo: *El Groquis* Alavaro Siza 68/69+95)



Figure 2. Shihlien Chemical Industrial Jiangsu (2009-2014)
(photo: internet)

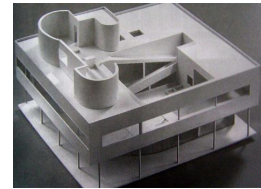


Figure 3. 'U type' in the Villa Savoy
(photo: internet)

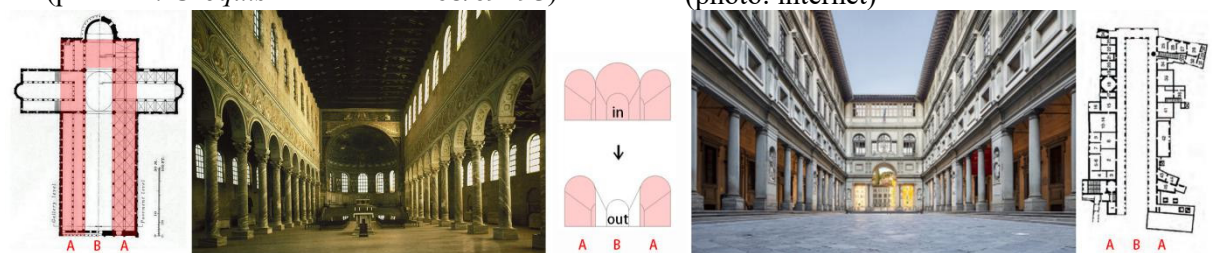


Figure 4. Transformation of 'Basilica' 'A-B-A' space form from indoor U type to outdoor U type
(photo: the author edited by the network picture)

2. U type as a result of the comprehensive transformation of diverse sources

Siza is not an architect with a transcendental color like Louis Kahn. Comparing to the pursuit of 'origin', he is more focused on the accumulation and transformation of 'source'. The concept of 'source', which has the dual connotation of Foucault's 'Archaeology' and Nietzsche's 'Genealogy', on one hand constitutes the challenge and criticism to the unidirectional reduction of 'origin', and on the other hand, points out the 'multidirectional and different network composition' [5]. It can be said that Siza's U type is the result of the accumulation, integration and transformation from multiple factors. It is the 'Heterogeneous Carnival' [5], which is inextricably linked to each other from reality or memory.

Clue 1: Deformation of the traditional local courtyard architecture in Portugal. Similar to many Asian architecture, its inner courtyard layout provides a form reference of 'closed to outside and open to insider' for Siza. It only lacks an outward opening compared with semi open U type. But it is a logical change for Siza, who is good at responding to the external context, and establishing multidimensional connections through transformation.

Clue 2: Impact of Scandinavian organic architecture culture. In the early days, Siza appreciated the architecture culture of the Scandinavia that is 'being close to nature and containing oppositions' [6], through Alvar Aalto, and showed his love for the way U type building absorbs external natural landscapes. Siza once said, 'he is very interested in the organizational form of the inner courtyard in some Aalto's architecture. These inner courtyards shrink the sight line at one end, and capture the lake and its surrounding landscape' [7].

Clue 3: Inheritance of Le Corbusier's architectural heritage - Villa Savoye. Villa Savoye not only marks the direction of the evolution of modern architecture, but also 'hides an inexhaustible and endless pursuit' [8], as Siza said. It contained a number of valuable form clues among which there's the trace of U type. Siza described in an article commenting on the Villa Savoye, 'it is unbelievable that there is a kind of tranquility that comes from the saturation of space tension. ...through the pathway connecting the master bedroom, another U type providing a sense of depth, and shows the view of the inner courtyard and the open space.' [8] (Figure 3)

Clue 4: Transformation of the traditional 'Basilica' 'A-B-A' space form from indoor to outdoor. (Figure 4) 'Basilica', considering the structural logic, needs to use both sides of the portico to

counteract the lateral thrust from the middle dome and then form a unique ‘A-B-A’ tripartite spatial form of Western classical architecture. Because it is closing one end and opening another end, both sides of the portico and the end face (usually a semicircular niche) enclose an internal U type, and create a classic paradigm of commemorative experience: people enter vertically from the gable wall on the open end, the sight line is first directed to the vanishing point in another closed end, and then people and god meet in the end along with the direction of the axis. Since then a dual opposition paradigm such as subject and object, man and God, daily and commemoration, exterior and interior was established. If this paradigm was shown only as an indoor U type in the past, it could be extended outdoors due to the demand of expanding public space in the later - the dome of the middle B section was removed to form a U type that could truly accommodate outdoor squares or courtyards.

3. The duality and universality of U type - The main reason of Siza's repeated use of the U type

Even though U type has an accumulation of time and history, and has abundant sources, it still cannot explain why Siza chose the U type. As an architect who pursues the spontaneity of architecture, Siza's goal is to reduce the subjectivity of the architect as much as possible. On the contrary, the fact that U type is repeatedly chosen, indicates that it has a universal value to solve real problems. This universality is not like the top-down form directive of modernism, but ‘the ability to create from the root ^[2]’, and able to satisfy ‘the intermediate state between questioning and pursuing to the reality ^[3]’. In the opinion of the author, the uniqueness of the U type is the ‘intermediate state’ which can either ‘move forward or backward’ and adapt to various changes since the beginning—it's a duality state between ‘closed and open, separable and mergeable, and invariability adapt to variability’.

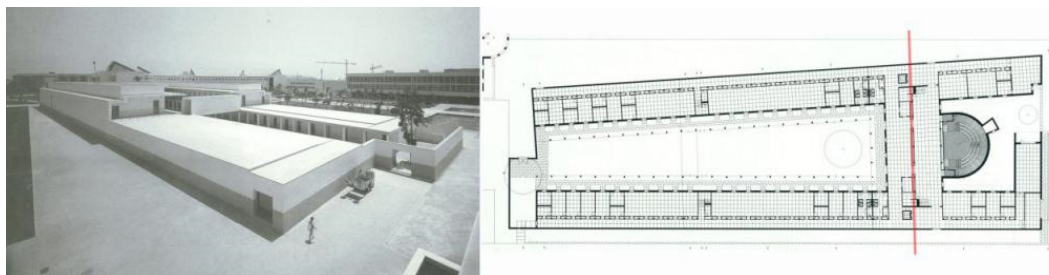


Figure 5. The facade closed to outside and ‘H type’ plan in Rectorate of the University of Alicante (1995-1998)
(photo: *El Groquis* Alavaro Siza 68/69+95)

3.1. U type between closing and opening

Is it necessary for buildings to immoderately respond to the surrounding environment or continue the city context? In other words, must the buildings which in special contexts be opened to the outside as far as possible? To this, Ando Tadao used his ‘Azuma House’ to prove that building can express an indifferent and closed attitude in a bad social environment; also, Jacques Lucan thinks, ‘the programme of a house or villa has been a privileged domain in which to develop architectural experiences.^[9]’ This is enough to explain why Eduardo Souto De Moura followed the ‘garden house’ route, a form of ‘the largest area that occupies the edge of the plot, closed to outside and open to inside’, created by Mies van der Rohe. More importantly, Mies emphasizes the duality from it: ‘once again here, the indispensable closed space and, simultaneously, the freedom of the open space.^[9]’ But Siza's grasp of U type is not limited to this. From the duality of closing and opening, he has found an more abundant one corresponding to it, such as ‘exterior and interior, object and architecture, silence and expression, commemoration and daily nature, abstractness and materiality’ and so on. These properties make the U type almost can adapt to any context and give Siza the freedom of the expression between the two poles such as abstractness and materiality. The only question is whether to open windows inwards or open holes outwards, or in both. In Rectorate of the University of Alicante, Siza easily realized a commemorative expression at the more than 100 meters long facade without any opening, for ‘against a sense of emptiness caused by the site ^[10]’, and the problems such as lighting

and ventilation were solved internally. This is the result of making full use of the duality of closing and opening . (Figure 5)

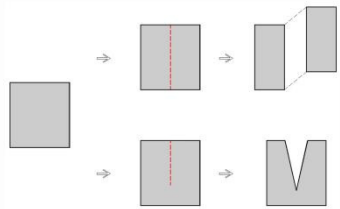


Figure 6. Diagram of the differentiation from complete form to the group and 'U type' (photo: the author's)



Figure 7. Museum Soulages in Rodez and its diagram by RCR Architectes (2014) (photo: from internet)

3.2. U type between monomers and groups

Obviously, Siza's preference for U type is also related to the characteristics of both monomeric and groupment of U type. Oscar Hansen who took part in the 'Ten Group' meetings, expressed his 'open form' by cutting a square into two equal halves, and then moving them to a new position relatively parallel^[11]. Unlike it, the open form of the U type is slightly ambiguous, it's more like a semi-finished product which has been cut to half and stop from a complete form (Figure 6). And if you cut it continuously, it would be divided into two parts, becoming a group fragment that introduces the outside landscape through the open gap, this operation technique is often used by RCR (Figure 7). But U type obviously gave up pure groupment, however it uses its three other full interfaces to indicate that it is still a monomer, but when you are in the inner courtyard and looking outward, you will feel the atmosphere of the groupment of a city or a settlement. (Figure 1)

3.3. U type between invariability and variability

The adaptiveness of U type comes from the dualistic state between 'house and yard, building and nature, invariable entity and variable void', this may be the most important reason why Siza insistently used U type.

Despite Siza said 'each design attempts to capture a specific moment in the short image accurately^[12]'. But he also admitted: 'the more precise the design, the more vulnerable it will be.'^[12] Therefore, he believes that design (processes) and even architecture (results) 'must change flexibly with the introduction of information. It is like a sculpture made of clay, which is damp, so that we can change its shape at any time^[13]'. 'wet clay' is like a house with a yard, the empty field adjusts the change - the courtyard not only can accept the variable natural factors, but also 'help to preserve the energy of the social groups^[14]', what is more important is that it may gain new spatial structure through reconstruction or additional construction to adapt to the change of demand. The choice of U type is 'the potential experiment for remaining and gap space^[14], like in settlements.

4. Differentiation, deformation and composition - Operational mechanism of U type returning to reality

The multiplicity of duality makes the U type have the potential to return to reality, but it is still a new root of city, is the core of ideal and the starting point of the reset, and it is looking forward to 'flowering and fruiting, to approaching the edge of reality, and arriving at the end^[2]'. As 'the theme of universality^[15](prototype)', we need to recover the 'demand and marginal issues^[15], that were previously shelved, and further clarify the specific path to return to reality.

It needs to be pointed out that U type is not necessarily the first choice for Siza. It may be an intermediate product developed by another prototype. But once the necessity of U type as a starting point has been determined, then Siza is no longer constrained to the size or gradation of the form, and the U type will be expanded to any scale, and may be composed with multiple U types according to the requirement.

4.1. Group differentiation and connection of 'big U type'

Taking the School of Architecture of Porto as an example, Siza deduces a process from a closed inner courtyard to a semi-open U type and further division and re-connection. From the original sketch (Figure 8), we can see the prototype is an closed volume with inner courtyard. After digesting the factors such as surrounding mountainous terrain, landscape, and road noise on the north, Siza determined to maximize the site space with an outstretched U type and dialogue with the Carlos Ramos Pavilion on the east. Conversely, the inner courtyard is surrounded to be a field of a 'inverted U type' (Figure 9), that is to say, the whole entity and the void are simultaneously defined by a large U type boundary. Further, the large U type shows a trend of group differentiation: the north wing of U type is divided into an independent and three seemingly connected fragments for isolation noise, corresponding to the features of form and scale of the four functions such as administrative office, lecture hall, exhibition hall and library; The south wing is divided into four buildings with different expressions for bringing the landscape into the inner courtyard thought the gap. The buildings seem to be separated, but they actually use the terrain elevation difference to hide the connected corridors. 'The continuity of fragments', a post - Cubist model that has been developed into Topological space^[16], seems to have been Siza's theme path to return to reality. The fragments must be connected. The connection is the way to solve the problems, as Siza said, 'order is the hub that connects all opposites.'^[17]

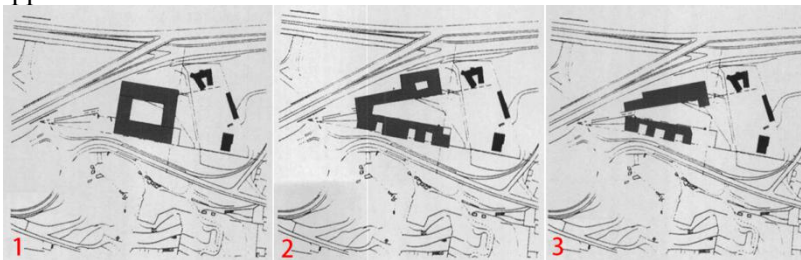


Figure 8. The sketch of previous three stages of the School of Architecture of Porto which shows the trend of the differentiation of the 'large U type' (1987-1994)

(photo: the author edited by the network picture)

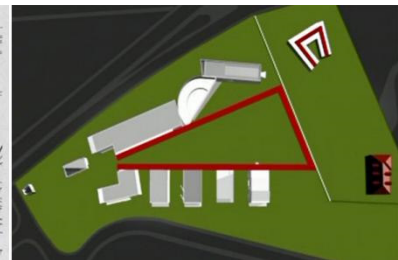


Figure 9. The final plan of the School of Architecture of Porto (photo: from video screenshot of 'Oporto School of architecture')



Figure 10. Variability of 'U type' in Siza's architecture: to absorb the external landscape (a), to turn to avoid trees flexibly (b), to insert the trivial functional volumes (c) (photo: *El Groquis* Alavaro Siza **68/69+95**)



Figure 11. 'Corner commemoration' in Brian family cemetery (1968-1978) (photo: *Carlo Scarpa: Flowing poetic quality in the space* p 191)

4.2. Monomer deformation and growth of 'small U type'

If the differentiation and connection of 'large U type' present in the search for an evolutionary path to return to reality between monomer and group fragments, the deformation and growth of 'small U type' are always trying to adapt to the reality by local variation in the single level, such as 'excision, protruding, concave, twisting, throwing, opening, floating, sinking, squeezing, and implanting.' This series of activating actions (operations) establishes an associated context with realistic factors.

Regarding the operations of deformation and growth discussed above, 'protruding' and 'concave' is worth mentioning first of all. This organic growth mode of simulating branch bifurcation is the

opportunity for Siza to absorb the external landscape, turn to avoid trees flexibly, to insert the various trivial functional volumes ignored previously and so on. (Figure 10) Secondly, the implanting of the ‘corner commemoration’. Perhaps influenced by Carlo Scarpa, how to restore or simultaneously contain classical commemoration in modern daily architecture, Scarpa wisely implants the classical axis into the corner to maintain the modern daily architectural features of asymmetry for both front and side. (Figure 11). This strategy has obviously been incorporated into the deformation path of U type by Siza: in the corner of the U type’s one wing of the Carlos Ramos pavilion, a commemorative axis is harmoniously implanted with an expressive staircase to form a ceremonial commemorative entrance. (Figure 1)

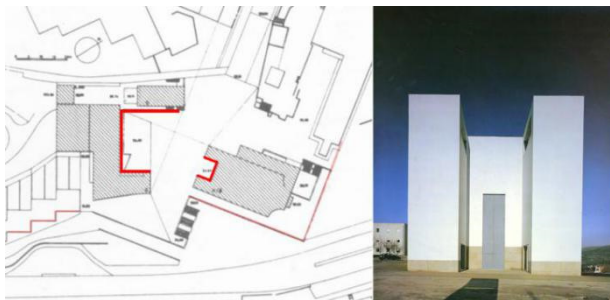


Figure 12. The composition of two ‘U type’ in Church in Marco De Canavezes(1990-1997)
(photo: the author edited by the picture from *El Groquis Alavaro Siza 68/69+95*)

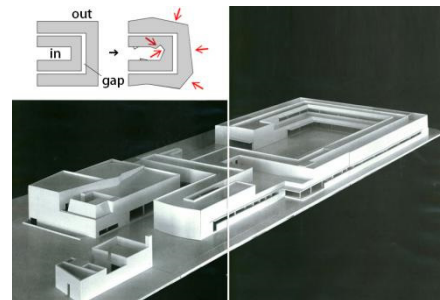


Figure 13. The composition and adjustment of ‘double U type’ in Rosario Municipal Centre (1997-)
(photo: the author edited by the picture from *El Groquis Alavaro Siza 68/69+95*)

4.3. Composition and adjustment of multiple U type

The composition of multiple Euclidean or Platon geometry is a common mode of configuration and composition. The composition of Multiple U types will lead to another view of another operation, and it is possible to bring the advantage of the U type's duality to the extreme. But for Siza, this operation of composition and adjustment based on U type does not constitute a game, but rather points to the needs of reality. To summarize roughly in three ways:

First, to enclose outer space of intermediary meaning with multiple U types. In the Church in Marco De Canavezes project, Siza composed two U types facing each other at an angle, and the two concave spaces combined with the surrounding space constituted a hierarchical exterior space. The logic of the angle comes from the extension of the existing two sets of orthogonal order systems in the site, which sutures the broken city context (Figure 12). Siza often uses this kind of gene fragment extending from the peripheral context to constitute a new architectural whole. Moreover, the void in the U type can be said as a fragment that extends from nature outside to inside, which makes a dualistic architectural whole in the form of “yard-void” with the “house-entity” together.

Second, H type. Composition of two back-to-back U types, forming different characteristic courtyards in order to respond to different directions of the external environment. In the Rectorate of the University of Alicante, the two U types created two kinds of atmosphere in courtyards: The east courtyard is the entrance for everyday life, it is slightly more livable, opens to the outside, and the depth of opening is shallower; the west courtyard is more hidden and is the place of practice for the monks, the ‘inverted U type’ gradually becomes narrower in the end to emphasize its inward characteristics, while the colonnade sequence of Islamic architecture is introduced to enhance the depth and religious atmosphere of the courtyard (Figure 5).

Third, Composition of ‘double-layered U type’ and the adjustment between internal and external tension. This is similar to the concept of the ‘double wall’. The purpose is to form two sets of internal and external body response interface, that is, the peripheral U type responds to the external context, the inner layer of U type responds to the internal requirements (Figure 13), the interconnections can be left a blank (such as leaving gaps like a walkway or courtyard). This kind of division of labor which

seems to be hierarchical in architecture actually points to the demand of continuity inside and outside. Rafael Moneo said, 'When he (Siza) is dealing with a building that we think is conflicting, the sense of the context scale becomes a protective layer. In the beginning, the appearance is determined only by the interior. That is not the case here, awareness of the surrounding environment is as important. Siza has the ability to deal two cards at the same time. Every action that is important to the outdoors, is also important for the indoors, and vice versa. The last continuity strengthens the characteristics of his work.'^[18] 'Continuity', if we understand this problem solving way that Siza is almost obsessed with, it is not difficult to understand the unique dualistic structure of Siza's doors and windows - the outer layer is metallic material for external moisture-proof and anti-corrosion, and the inner layer is wood material for the internal insulation ^[19], also not difficult to understand the significance of reality through the adjustment of the "double layer U type" balanced between internal and external tension.

5. Conclusion

What does the U type mean to Siza? According to the logic of spontaneous evolution, U type originated from reality (past) and will return to reality (future). In this process of evolution, the first is the aggregation and transformation of multidirectional source of the U type; the second is to validate the applicability and the variability of the U type and then put it into the reality; finally, a series of operating methods will be used as a specific evolutionary path to guide the U type to return to reality. In this whole process, the intervention of the architect itself may be an indispensable part of reality.

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