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**FURNITURE AS ARCHITECTURAL ELEMENT**

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**ABSTRACT**

The aim of this paper is to analyze the concept of incorporating furniture and equipment into architectural design, a concept familiar to both vernacular and contemporary architecture. The first section explores the symbiosis of architecture and furniture/equipment in traditional Macedonian architecture from the 19<sup>th</sup> century. Such a holistic approach was also perceived in the ideas of modernists from the beginning of the 20<sup>th</sup> century, who were strongly inspired by vernacular architecture. Further, various ideas that developed persistently and progressively all the way to the contemporary era were observed from the current perspective, by investigating their original approaches of reaffirming such concepts. For the purpose of this study, several distinctive cases were analyzed in respect of their features relevant to the topic.

**Key words:** architecture, furniture, equipment, integration, holistic approach.

**1. INTRODUCTION**

In the process of continuous development and rational selection of architectural elements over the centuries, various practical solutions for integrating furniture into architecture were invented in vernacular buildings. Throughout a rich and diverse history, different methods, principles, values and knowledge evolved as instincts that can be subtly detected in many segments of traditional architecture. That was particularly inherent to Macedonian residential architecture from the 19<sup>th</sup> century. It is fascinating how the advanced principles of modern architecture had previously been developed in traditional architecture in a visionary way, by honest, complex and refined methods, and intense architectural expressions. Therefore, this study will investigate the architectural properties of furniture in Macedonian traditional architecture, as well as the forms of development and reinterpretation of such concepts in contemporary context, considering the modernist movement as an inseparable link between vernacular and contemporary practice.

**2. INTEGRATION OF THE FURNITURE AND ARCHITECTURE IN TRADITIONAL MACEDONIAN ARCHITECTURE**

The organic symbiosis of architecture and furniture is strongly expressed in traditional Macedonian architecture from the 19<sup>th</sup> century. They are of the same material and, despite the fact that they had been built separately, they share a common structural logic; when building the interior, two construction methods were distinguished: 1) built-in elements were placed in a stone wall, and 2) built-in furniture was incorporated into the interior wood-frame wall (Nikoljski Panevski, 2018). The wall, apart from being a partition, also develops into a rationally organized multipurpose functional container. The monolithic built-in cabinet system, usually placed along an entire wall of the room, is an attractive element for observation in this particular architecture. According to the region or their specific use, cabinets are named differently: 'sergen', 'musandra', 'dolap', 'dzamlak' etc.

The standard cabinet system is composed of: a tall cabinet for cleaning supplies, a cabinet for cooking utensils, a wide ‘sergen’ for bed linen storage and a wardrobe for clothes, everything closed and arranged behind a single wall surface [fig.1](Chipan, 1982). Also, the fireplace is usually incorporated and positioned in the middle zone, thus tending to create a symmetrical arrangement. The carpenters took advantage of the opportunities offered by such a large wall area and thoughtfully approached arranging it, cleverly combining separate elements into a harmonious compositional whole, using compliant measures, proportions and ornamental finishes [Fig.2] (Hadzieva Aleksievska, 1985). Solutions for incorporating cabinets into the staircase are extremely ingenious and practical [Fig.3], like, for example, using the volume above the stairwell as a storage space, with a cascading adjustment of cabinets’ bases in accordance with the stair slope [Fig.4]. Mostly in Muslim houses, there is also a bath (hamamdzik) inserted in the cabinet, an analogy of today’s shower cabin concept [fig.5]. In Lazaropole village there are examples of cabinets (musandra), which, apart from storing bed linen, have another unusual function: in the lower zone there is a hidden opening through the floor structure leading to the basement of the house, serving as a safety exit from the house [fig.6](Karanakov 1999).

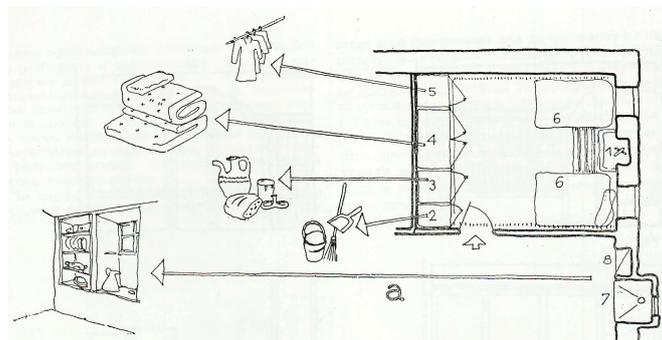


Figure 1. Standard built-in cabinet system – image from Chipan (1982)

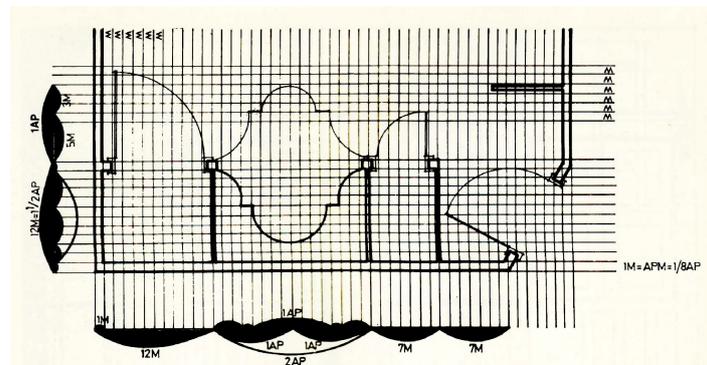


Figure 2. Study of modular design of a built-in cabinets – image from Hadzieva Aleksievska (1985)

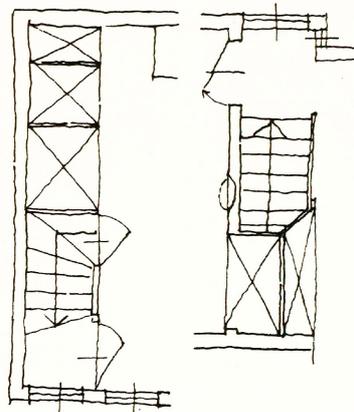
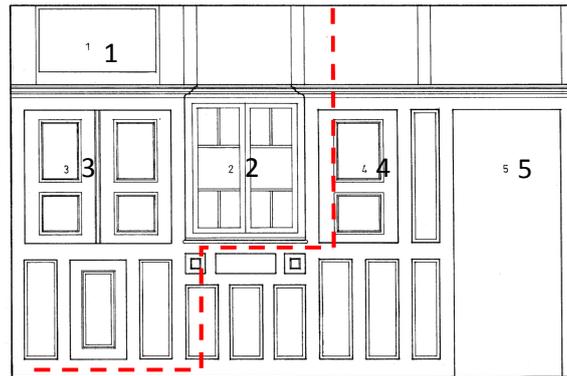
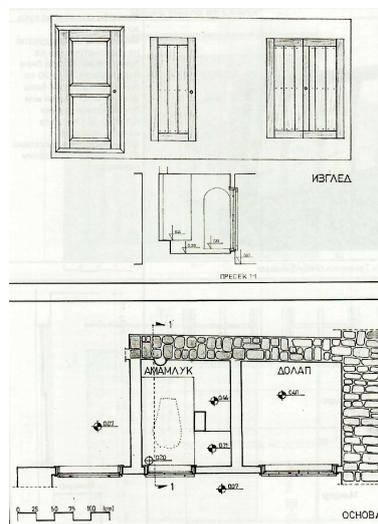


Figure 3. Cabinets incorporated into the staircase – image from Hadzieva Aleksievska (1985)

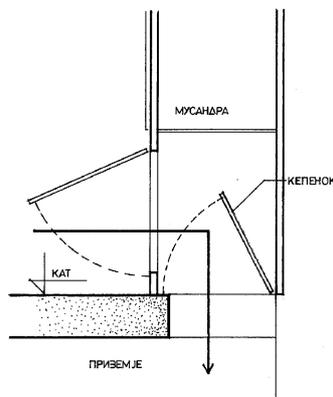


1. Space for icon; 2. Cabinet with glass doors; 3. Wardrobe – ‘musandra’; 4. Disguise; 5. Door to the staircase

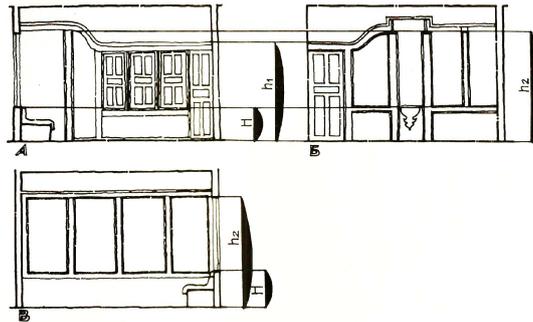
**Figure 4.** Cabinets incorporated into the staircase – image from Karanakov (1999) – the red line is added to distinguish storage from staircase space



**Figure 5.** Elevation, section and plan of a bath unit (hamamdzik) incorporated into a cabinet– image from (Nicoljski Panevski, 2018)



**Figure 6.** Section of a cabinet showing safety exit route – image from Karanakov (1999)



**Figure 7.** Proportions of the interior – image from Hadzieva Aleksievska (1985)

According to Grabrian, this kind of house appears to be almost empty, and obviously, movable furniture doesn't fit well in spaces that are beautiful and harmonious only when empty (Grabrijan, 1952, as cited in Chipan, 1982). All interior elements are composed in a modular consistent unity. The harmony of all functional units in the space is achieved by modular coordination and composability through a process of overall standardization, which is apparent in the following relations: the head of the door is in line with the upper shelf; the parapet is in line with the lower paneling, the working surface and the backrest of the seats (minder); the head of the door is connected to the head of the cabinet (sergen); the head of the cabinet (sergen) is connected to the head of the window, etc. [fig.7](Hadzieva Aleksievska, 1985). It is a matter of complete standardization of the house interior and partially of the exterior, and also typifying the elements according to the functional needs of a man (Nicoljski Panevski, 2018). Usually, the entrance door of the room is incorporated into the cabinet system, placed in a niche next to the corner of the room. When storage is placed in the interior walls of a room, around the doorway, the resulting thickness will make the transitions between rooms and corridors more distinct, and for the person entering such a room, the thickness of the wall creates a subtle "entry" space, which makes the room more private (Alexander et al., 1977). From practical point of view, the corner positioning of the door also allows maximal use of the wall surfaces for equipment, thus enabling centric spatial arrangement. At the same time, the visual experience upon entering the room is enriched by emphasizing the diagonal direction, which is the largest dimension. In that way, the space is perceived simultaneously as an intense experience improved by abundant light and gorgeous views from the windows usually rhythmically distributed along the opposite walls.

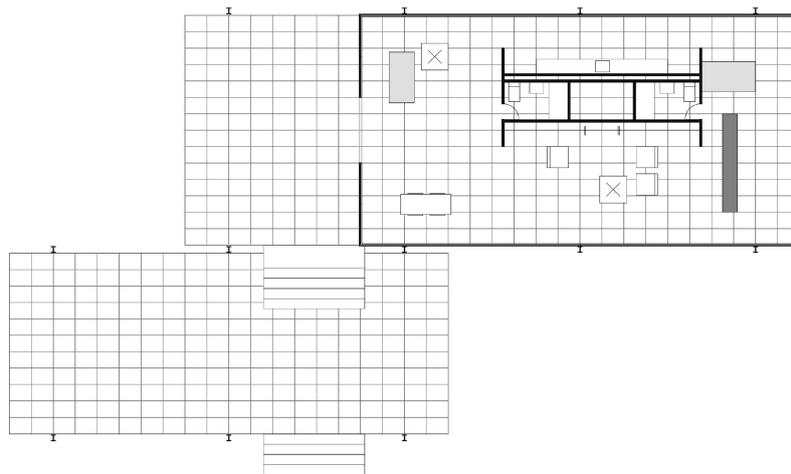
### 3. INTEGRATION OF FURNITURE AND ARCHITECTURE IN CONTEMPORARY ARCHITECTURE

The holistic approach - an integrated concept of architecture and interior elements expressed in the vernacular architecture - was a strong inspiration and starting point in the ideas of modernists from the beginning of the 20<sup>th</sup> century. They reaffirmed that concept in accordance with their philosophical views and technological context of their time, a concept that is still developing. While proclaiming the new spirit, based on his impressions and insights from his 'journey to the East', Le Corbusier (1986) emphasized the irony that some nations were dropping the traditional home (with its fittings, etc.) to live in an up-to-date house a l'europeenne with its imitation stone stucco and its mantelpieces. Modern architects designed furniture which could express the new life-style in a way which was characterized less by 'possessions' and more by 'activities'; so, where possible, storage of various kinds and even divans and beds were built-in (Benton, 1990). According Le Corbusier, a new term replaced the old word 'furniture', which had stood for fossilizing traditions and limited utilization. He named it as 'equipment' instead, which according to him, implies the logical classification of the various elements necessary to run a house, which results from their practical analysis. Standardized fitted cupboards, built into the walls or suspended from them, are allocated to every point in the home where a daily function has to be performed... it represents the entire "furnishing" of a home, leaving a maximum of unencumbered space in every room, and only chairs and tables to fill it (Le Corbusier and Jeanneret, 1995). Le Corbusier established 3 types of cabinet installations at the exhibition of Salon d'Automne in 1929 as ideal theory: a cabinet put against the

wall, an independent cabinet separated from the wall, and a cabinet incorporated into the wall (Sendai, 2019).

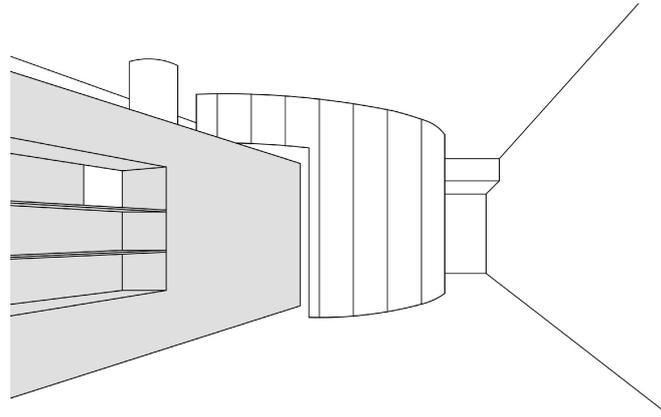
One of his most impressive examples of built-in furniture of that time is the extravagant minimalist library cabinet in the Villa Church from 1929, which covers the entire wall surface, while the existing structural frame is cleverly concealed by sliding doors made of aluminum plates arranged in three equal horizontal portions. Further, Le Corbusier by using freestanding cabinets separated from the wall, with a medium or full height to the ceiling, turns them into partitions that separate the space. The cabinet is neither incorporated into the wall, nor movable furniture, but becomes a wall itself, thus enabling different levels of separation based on the design. Le Corbusier's Modulor, the proportional system based on human body dimensions and the golden section, represents a unifying system of separate elements in both architectural and interior design.

Mies van der Rohe quite skillfully integrates the furniture into the architectural design. In Farnsworth House he uses ground-paved homogeneous mesh in order to integrate the architecture and furniture into a unified whole through close correlations in space modulus, structure system, material texture, node structure and appearance form, which together embody Mies's construction logic and space design philosophy (Fu, 2019). Through his abstract idealistic approach in the Farnsworth House, besides assigning an immaterial character to the external glass walls, he entirely redefines the concept of the internal wall by creating two free-standing cubes in the space. The first cube integrates the utilities: bathrooms and the technical room are incorporated along with the kitchen elements and the fireplace in a way that all the spaces in the house are defined by the position and features of that primary cube. The second, smaller cube serves as a wardrobe and visually separates the living from sleeping space. Thus, furniture is used as an architectural element that separates spaces by simultaneously assigning each space a different purpose [fig.8].



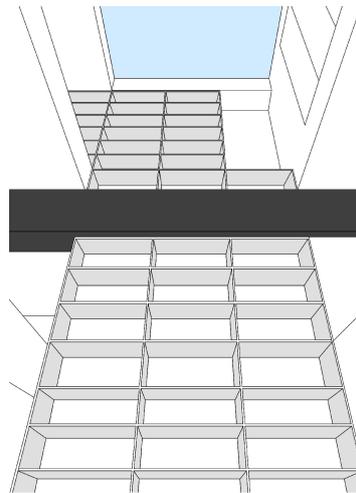
**Figure 8.** *Farnsworth House by Mies van der Rohe in Plano, Illinois – floor plan*

Rem Koolhaas in the Villa dall'Ava reaffirms the concept of Mies van der Rohe's "glass house" as a single fragment of a technologically, programmatically and aesthetically far more complex structure and context. The unity of the architecture and the interior is particularly expressed in the way the architect camouflages the main load-bearing structure of the strong concrete columns which mostly support the load of the rooftop pool. It is achieved by integrating the columns into the continuous freestanding cabinet, which becomes a major solid component in the transparent and open-plan ground floor. The cabinet as a compact cube also contains open book shelves, and some of the kitchen elements. In a suprematistic manner, it penetrates through the translucent curved kitchen wall, thus in a surreal way uniting kitchen and living/dining space [fig.9]. At the same time, it separates the main space from the ramp descending to the lower level, but also connects them through the subtle perforations and the gap beneath the ceiling. That wall/cabinet acts as a stabilizer that balances the contradictions between the glass house and the rooftop pool. With its monolithic form and compactness, it simultaneously absorbs and articulates the tension between the heavy load of the pool and the floating form of the house.



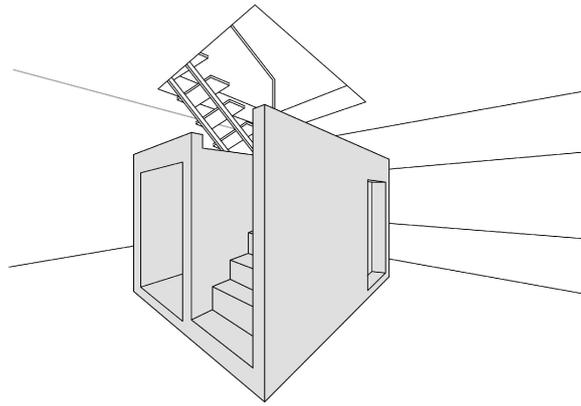
**Figure 9.** Interior of the Villa dall'Ava, designed by OMA

In a similar way, as an architectural element - a wall, in the Maison à Bourdeaux, Rem Koolhaas builds the monumental library cabinet that rises along all three levels [fig.10]. It is positioned as a partition between the stairwell and the open shaft of the spacious platform-elevator/home-office, which acts as a central motif in the house designed for a person in a wheelchair. The library marks the domain of the office space and indicates the movement direction of the platform, thus metaphorically rising up to the sky which can be seen through the glass roof. It is a unifying element of all levels, in both compositional and semantic ways, a static counterpoint and stabilizer of the dynamic and flexible concept of a mobile office that moves vertically according to the needs and mood of the user.



**Figure 10.** Library in the Maison à Bourdeaux, designed by OMA

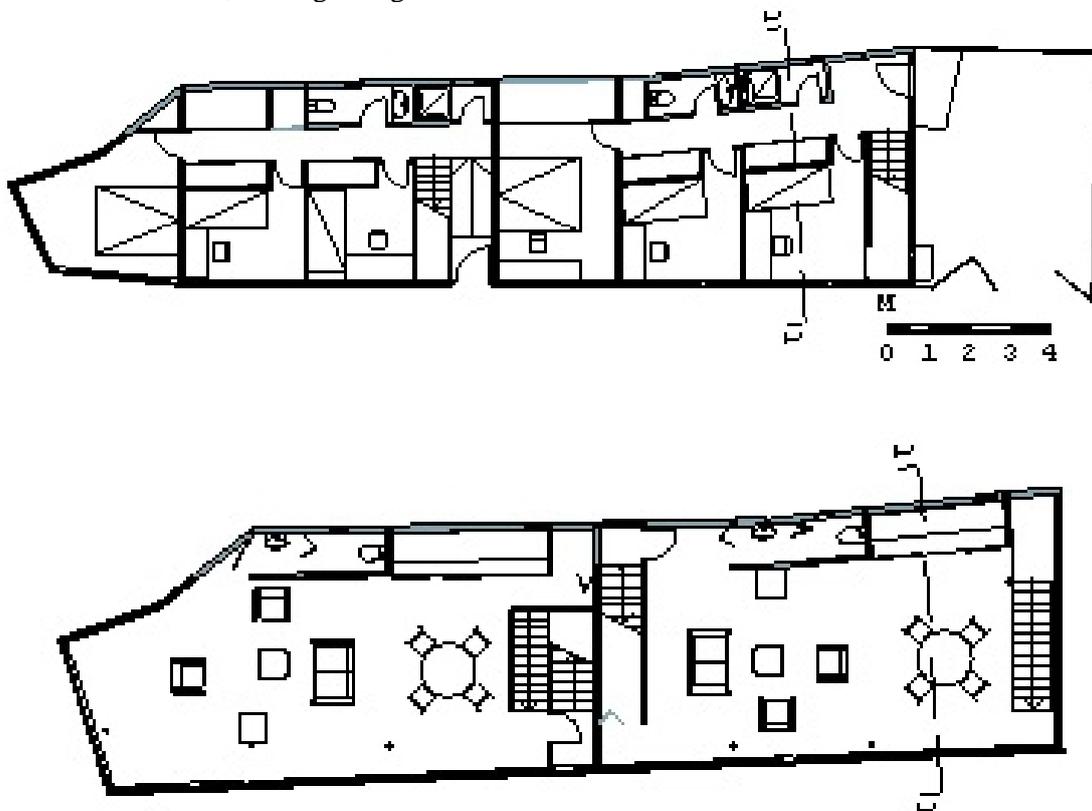
In today's context, Anna Yudina (2015), while analyzing the possibilities that appear on the frontier between the domains of architecture and furniture, uses the term "furniture". Among the many architecture/furniture cross-overs included in her book "Furniture: Furniture That Transforms Space", I would single out the example of the staircase element in a residential house in Tokyo that was adapted from an old mixed-use building [fig.11]. "Having re-purposed an old, mixed-use building into a house, Torafu Architects inserted a square aperture in the ceiling with a large multifunctional box directly underneath to connect the two upper floors. This cubic volume, with integrated stairs and built-in furniture (a bookcase, two wardrobes, a TV stand and a closet), is placed slightly off-center, loosely dividing the open-plan room into spaces with different identities and functions. A landing at the top of the cube provides a small, interstitial space." (Yudina, 2015). The stair element with its distinct cubical shape simultaneously serves as a sculptural object, in-between space, wardrobe, bookcase, wall and generator of the architectural plan.



**Figure 11.** Staircase element in a house in Tokyo, designed by Torafu Architects

### 3.1. Case study for contemporary reinterpretation of traditional concepts

In one of my previous researches for the purpose of my diploma work, I proposed a double-house design for an actual location in the historical ambient amid the old part of the town of Struga. Along the process of research, seven different models were developed. Related to this topic, I would point out the first model that proposed a synthesis of the massive stone wall and the closet/utility system, both inherent to traditional architecture [fig.12]. Through a reinterpretation of the traditional thick stone wall that usually extends over the entire height of the rear facade of the house, and also by use of lightweight structure and contemporary efficient insulation materials, the solid and massive was inverted into an empty and lightweight one. The traditional idea of the thick (usually north) rear wall of the house was metaphorically reinterpreted as a functional multipurpose element with built-in components: wardrobes, bathrooms, kitchens and utility rooms - spread continuously over the entire rear facade of the house, making a single coherent whole.



**Figure 12.** Double-house in Struga, floor plans

#### 4. CONCLUSION

The concept of integrating the interior into the architectural design of the house in vernacular buildings represents a strong basis that inspired the evolution of furniture as an architectural element in contemporary architecture. Analyzing the development of built-in cabinets as complex objects of diverse components through several distinctive cases, we identified remarkable forms and different degrees of integrating the furniture into the main structure of the object. The principle of a pure "abstract" space is a strong motive in contemporary architecture, thus encouraging incorporation of storage space as built-in equipment with a multi-purpose function, or in the case when separated from the architecture, it becomes an autonomous architectural element - a functional sculpture or a wall, i.e., an object that apart from its primary function, becomes a significant element of defining space and simultaneously enabling various levels of separation. It becomes an element that, in addition to its indisputably functional features, often acquires a metaphorical meaning and can be reintegrated into the architecture in a more complex interactive way.

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