

THE FLEXIBLE APARTMENT AS A PARADIGM OF POST-PANDEMIC HOUSING

Abstract:

The paper examines the key factors shaping quality of life in contemporary apartments, in line with 21st-century needs, with a focus on the post-pandemic period. The COVID-19 pandemic altered housing patterns: during restricted mobility, the apartment took on the functions of home, work, recreation, and recovery, thereby redefining comfort criteria. The living room again becomes the central space, remote work is reinforced, and the need to exercise at home and maintain a more direct connection with nature increases. The paper considers the contemporary apartment through the concept of flexibility-its capacity to adapt to changing life scenarios, in order to better understand the relationship between housing typology, everyday practices, and residents' well-being.

Keywords: flexible apartment, post-pandemic housing, Covid-19, housing comfort

ФЛЕКСИБИЛНИ СТАН КАО ПАРАДИГМА ПОСТПАНДЕМИЈСКОГ СТАНОВАЊА

Сажетак:

Рад испитује кључне факторе који обликују квалитет живота у савременом стану, у складу са потребама 21. вијека, уз фокус на постпандемијски период. Пандемија COVID-19 промијенила је обрасце становања: током ограничене мобилности стан је преузео функције дома, рада, рекреације и опоравка, редефинишући критеријуме комфора. Дневни боравак поново постаје централни простор, афирмише се рад од куће, расте потреба за вјежбањем у стану и за непосредним контактом са природом. Рад сагледава савремени стан кроз концепт флексибилности - способности прилагођавања промјенљивим животним сценаријима, ради јаснијег разумијевања везе између типологије, свакодневице и комфора станара.

Кључне ријечи: флексибилни стан, постпандемијско становање, Covid-19, комфор

1. THEORETICAL AND HISTORICAL BACKGROUND: SETTING THE POST-PANDEMIC CONTEXT

1.1. HOUSING FLEXIBILITY AS AN ARCHITECTURAL CONCEPT

In contemporary housing discourse, flexibility should not be understood as a short-term response produced only by the COVID-19 pandemic, but as a long-standing architectural and typological issue. The question of how a dwelling can accommodate change over time has accompanied modern and contemporary housing debates for decades, especially in relation to changing household structures, technological transformation, urban densification, and the tension between standardization and lived diversity. In that sense, the flexible apartment is not a new invention, but a renewed necessity. Global urbanization trends make this question even more relevant, since multi-family housing increasingly becomes the dominant living form for large parts of the population. United Nations data indicate that 55% of the world's population lived in urban areas in 2018 and that this share is projected to rise to 68% by 2050, which implies a continuing growth of apartment-based living and a stronger pressure on residential typologies to absorb increasingly complex everyday routines [1].

A crucial theoretical contribution to this topic was made by Tatjana Schneider and Jeremy Till, who define flexible housing as housing that can offer choice at the design stage or support change over time during occupation [16], [17], [18]. Their work is important because it expands the meaning of flexibility beyond simplistic notions of movable walls or multifunctional furniture. In their reading, flexibility is tied to the deeper logic of housing organization: whether a dwelling is overdetermined or open to reinterpretation, whether rooms are neutral enough to host more than one use, whether thresholds can mediate changing routines, and whether inhabitants can adapt the dwelling without major construction. Flexibility therefore concerns both social and physical adaptability. It is not simply a question of formal novelty, but of architectural capacity.

This understanding resonates strongly with N. John Habraken's open-building approach. Habraken argued that housing should not be conceived as a completely fixed and finalized object, but as a layered system that distinguishes between long-term support and shorter-term infill [19]. The structural frame, vertical communications, service cores, and infrastructural logic belong to the durable layer; partitions, room arrangements, and interior adaptations belong to the more changeable layer. This distinction remains highly useful in evaluating apartment design today because it reveals where genuine transformability is possible and where it is limited by the "hard" infrastructural structure of the building. A dwelling can only be flexible to the extent that its durable and adaptable components have been intelligently separated.

From this perspective, flexibility in housing can be understood through several recurring architectural themes: polyvalent rooms, indeterminate or non-overdetermined space, spatial neutrality, movable or negotiable thresholds, concentration of services, and the possibility of multiple life scenarios unfolding within the same plan. Schneider and Till further distinguish between "hard" and "soft" approaches to flexibility, as well as between determinate and indeterminate design logics [16], [17]. The former often involves physically transformable systems, while the latter allows users to reinterpret space through use patterns without necessarily changing the construction itself. This distinction is especially relevant for apartment design, where cost, structure, and market standardization often make radical transformation impractical, while more subtle forms of spatial adaptability remain achievable.

The historical importance of flexibility also lies in the fact that housing is a relatively slow and durable form of construction, whereas life is fast, unstable, and continuously changing. Households evolve; children grow up; people age; domestic labor patterns shift; digital technologies alter work and communication; crises interrupt established routines. A housing model that assumes a fixed family structure and a fixed division of functions is therefore structurally vulnerable. One of the central lessons of twentieth-century housing theory is precisely that architecture should not overdetermine everyday life, because life inevitably exceeds such prescriptions [18], [19]. In this sense, flexibility is not an optional supplement to housing design, but one of the main ways architecture can remain relevant across time.

This theoretical lineage is essential because it prevents the post-pandemic housing discussion from becoming historically shallow. If flexibility is presented only as a result of COVID-19, then the analysis remains incomplete. The pandemic did not create the need for adaptable housing; it exposed the consequences of ignoring it. The apartment was already under pressure from urban densification, rising real-estate costs, shrinking units, and the digitization of everyday activities before 2020. What

the pandemic did was to intensify and dramatize those pressures in a way that made spatial inadequacies newly visible [10], [11].

1.2. THE APARTMENT BEFORE AND AFTER THE PANDEMIC

Before the pandemic, the organization of everyday life in many urban contexts still relied on a relatively stable distribution of functions across the city. Paid work was generally anchored in the office; schooling in educational institutions; exercise in parks, gyms, and sports facilities; leisure in cafés, public spaces, or cultural venues; and the apartment primarily functioned as the site of rest, care, domestic reproduction, and private life. Although remote work and digital labor already existed before 2020, they had not yet reconfigured the apartment to the extent later seen during the pandemic. The city itself acted as the broader infrastructure that distributed and specialized activities.

The COVID-19 pandemic abruptly disrupted that urban-functional geography. Lockdowns, stay-at-home orders, and mobility restrictions transferred a wide range of daily functions into the home. International studies consistently show that domestic space suddenly had to absorb work, study, socializing, child care, exercise, entertainment, and prolonged daytime occupation [4], [5], [6], [7], [8], [9], [10], [11]. Under these conditions, the apartment ceased to function mainly as the place one returns to after externally organized obligations; it became the place where those obligations themselves had to unfold. This shift transformed both the material use of space and the meaning of housing quality.

In Serbia, the most intensive pandemic restrictions were tied to the declaration of the state of emergency on 15 March 2020 and the subsequent epidemiological measures that significantly limited mobility and public contact. The state of emergency was formally lifted on 6 May 2020, but the period of restricted movement already made visible the extent to which apartments had to support overlapping routines under pressure [2]. In parallel, schooling was shifted into the domestic sphere, and distance learning became part of family life. Research on primary education in Serbia during the COVID-19 crisis shows that distance learning reconfigured the temporal and spatial organization of households through class schedules, device sharing, internet dependence, concentration demands, and noise control [3]. These changes did not affect only educational performance; they altered the spatial logic of the apartment itself.

The post-pandemic apartment therefore needs to be understood not merely as the same apartment under temporary stress, but as a dwelling exposed to a different regime of use. Working from home made the lack of quiet and privacy much more visible. Online meetings made acoustic leakage and spatial exposure more problematic. Long hours indoors made daylight, fresh air, and contact with the outside more valuable. Domestic interiors that had once seemed “sufficient” were often revealed as too rigid, too thinly dimensioned, or too weakly differentiated to support simultaneous activities [6], [7], [9], [10]. The apartment became the place where incompatibilities had to be negotiated in real time.

Importantly, this shift did not disappear entirely with the end of the strictest measures. Hybrid work, periodic home-based digital obligations, online services, and more fluid work schedules have persisted in many contexts after the acute phase of the pandemic [6], [10], [11]. The post-pandemic condition is therefore not simply a historical episode; it is also a transformed expectation. Many households now expect that a dwelling should be able to support at least occasional work from home, online appointments, extended daytime occupation, and a stronger need for environmental comfort. In this sense, the apartment has not returned fully to its pre-2020 functional role. Instead, it increasingly operates as an active and multifunctional infrastructure of everyday life.



Figure 1. Learning from home during the COVID lockdown, sitting at the dining table [20].

1.3. THE POST-PANDEMIC APARTMENT AS A MULTIFUNCTIONAL SYSTEM

One of the most useful ways to understand the post-pandemic apartment is to describe it as a multifunctional system. This does not mean merely that more activities occur there than before. It means that the apartment has become a spatial framework within which different temporal regimes, bodily needs, and environmental requirements must coexist. Work, study, cooking, eating, resting, social interaction, leisure, and retreat no longer happen neatly one after another or in separate urban locations; they overlap, interrupt one another, and compete for the same surfaces, light, silence, and attention.

This condition has been described in recent scholarship with unusual clarity. Sheldrick et al. argue that during the COVID-19 period homes became the “everything space,” especially for children and families, with significant implications for sitting, physical activity, and the domestic environment [5]. Mayer and Boston show that working from home outcomes are strongly conditioned by the residential built environment, including available area, housing type, indoor environmental quality, and the ability to create a dedicated workspace [6]. Bonenberg and Lucchini similarly emphasize that remote work and study highlighted spatial inadequacies within residential interiors, particularly in relation to privacy, ergonomic suitability, and the ability to maintain concentration [7]. More recent qualitative work by Milián Bernal et al. adds another important insight: people do not merely occupy the home differently; they actively “reappropriate” it through tactics of positioning, object arrangement, and bodily routines that temporarily produce a workspace where none existed before [8]. Taken together, these studies suggest that the problem is not only the amount of space, but also the apartment’s capacity to be re-read, negotiated, and modulated through use.

The apartment as a multifunctional system also forces a reconsideration of housing well-being. During prolonged indoor occupation, environmental qualities that may once have seemed secondary acquire much greater importance. Daylight affects not only illumination, but work comfort, mood, and temporal orientation. Ventilation affects both physical comfort and the subjective livability of the apartment. The possibility of stepping outside onto a balcony or loggia becomes an immediate form of recovery, micro-retreat, and sensory change. Apartment research during and after lockdowns shows that homes may be experienced as smaller, more stressful, and more conflict-prone when the dwelling is required to absorb too many functions without sufficient differentiation [9]. Thus, the architectural issue is not only flexibility in an abstract sense, but flexibility as it relates to privacy, environmental quality, acoustic buffering, and everyday psychological resilience.

This is where the apartment boundary becomes especially important. Balconies and loggias have gained renewed theoretical and practical significance because they mediate between domestic interior and the outside world. Peters and Masoudinejad show that balconies can function as adaptable residential spaces that extend the usable range of the dwelling and improve the residents’ ability to adjust daily life to changing needs [13]. Masoudinejad’s later concept of the “home boundary” provides an even broader framework by arguing that architectural features mediating

between home and outside affect residents' connections to nature, social life, and everyday resilience [14]. The post-pandemic apartment is therefore not simply an interior problem. It is also a question of how interior and exterior are related, filtered, and made mutually supportive.

Within this context, the research question of this paper can be stated more precisely: how can flexibility be understood as a typological and spatial capacity of the apartment in a post-pandemic context, and how do different design strategies support or limit that capacity? The hypothesis guiding the paper is that the more a dwelling can accommodate overlapping daily routines through adaptable spatial organization, transitional zones, environmental access, and differentiated privacy conditions, the more effectively it supports residential comfort and well-being. This hypothesis is tested through a comparative reading of two different but complementary case studies: HKS's post-pandemic multifamily layouts and AKVS's Slavija-Manež project in Belgrade.

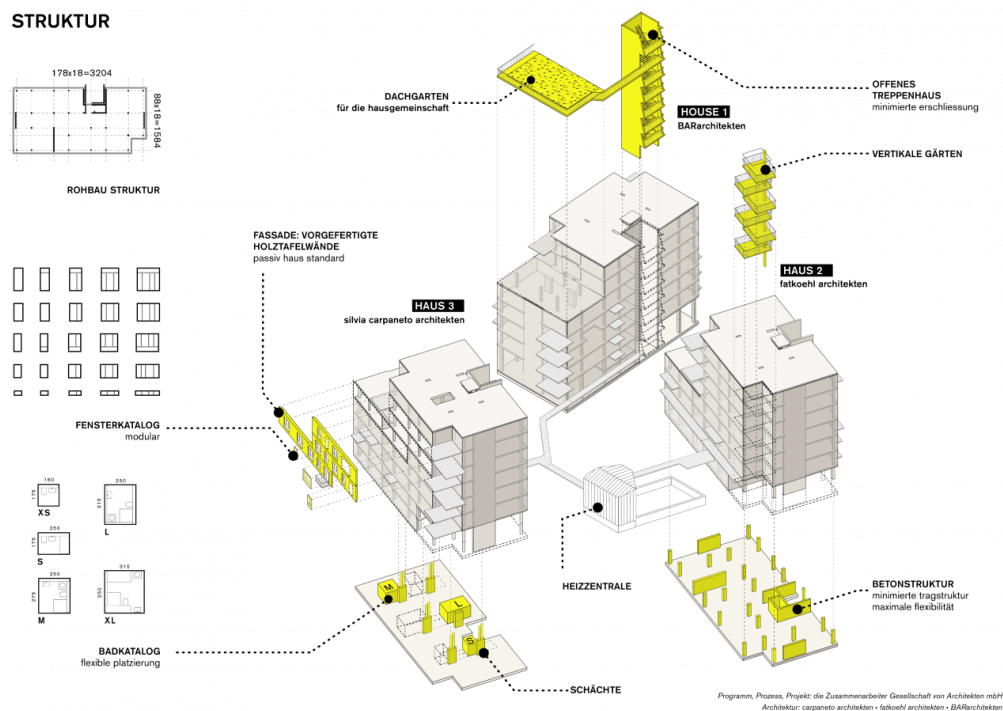


Figure 2. A live-work in main room in apartment [21].

A key consequence of this consolidation is the blurring of boundaries between work and privacy. Work tasks spill into “private time,” while domestic responsibilities interrupt work flow, because the same space must host competing activities. Qualitative research on home-based work emphasizes how households continually negotiate quiet, privacy, scheduling, and entitlement to space, often developing tactics of temporary spatial claiming, positioning, ad-hoc barriers, and routines that mark the start and end of work in the absence of spatial separation [8]. At the same time, the shift reshaped how people *experience* the apartment: studies of housing during lockdowns indicate that the home can be perceived as smaller, more conflict-prone, or more exhausting when it is required to absorb functions that were previously externalized to the city [9].

In post-pandemic terms, this pattern does not simply “snap back” to pre-2020 norms. Instead, it persists as a new expectation: the apartment should be able to support hybrid routines, periodic working from home, online learning, and digitized obligations, alongside traditional domestic functions. Consequently, recent literature increasingly argues for more adaptable housing typologies and “hybrid homes” capable of taking on some of the city’s functions whenever mobility is disrupted or work/education regimes shift [10]. In that sense, the before/after contrast is not only a historical comparison; it also signals a lasting redefinition of housing as an active infrastructure of everyday life, integrating work, learning, recreation, and recovery, often simultaneously and under real constraints of floor area and household dynamics [11].

2. LIVING THE METHODOLOGICAL SETUP AND CASE STUDY DESCRIPTIONS

2.1. RESEARCH AIM AND METHODOLOGICAL FRAMEWORK

This paper examines the flexible apartment as a contemporary housing paradigm by combining theoretical analysis with case-study comparison. Methodologically, the research is based on a triangulated qualitative framework that integrates three components:

- (1) a critical review of relevant literature;
- (2) descriptive and analytical reading of selected case studies; and
- (3) comparative cross-examination through shared criteria.

The purpose of this approach is to avoid two frequent weaknesses in housing research: on the one hand, an overly abstract theoretical discussion detached from concrete design practice; on the other, a purely descriptive presentation of projects without a clear analytical framework. By triangulating theory, case description, and comparison, the paper aims to derive conclusions that are both conceptually grounded and architecturally specific.

The literature review establishes the conceptual field of the research. It includes classical and contemporary architectural discussions of flexibility, adaptability, and open building [16], [17], [18], [19], as well as more recent scholarship dealing with pandemic housing, remote work, domestic multifunctionality, apartment well-being, and the role of balconies and boundaries [4], [5], [6], [7], [8], [9], [10], [11], [13], [14]. This first layer makes it possible to frame flexibility not as a decorative feature or a furniture strategy, but as a deeper architectural capacity tied to typology, services, thresholds, and lived time.

The second methodological layer consists of two case studies. The first is HKS's 2020 article "How Design Will Shift to Accommodate Post-COVID-19 Multifamily Living," which presents modified apartment layouts responding to new domestic demands under pandemic conditions [12]. The second is the AKVS project "Residential-Commercial Complex Slavija-Manjež" in Belgrade, where the transformable loggia is treated as a key spatial instrument of housing quality and transformability [15]. These cases were selected because they approach the same broad issue from different angles. HKS explores flexibility under compact and market-typical apartment conditions. AKVS explores flexibility through a more explicit architectural device in a higher-standard housing context.

The third methodological layer, and the one most directly answering the reviewers' comments, is the comparative framework itself. Rather than treating the two cases as parallel descriptive examples, the paper applies a shared comparative structure based on five criteria:

- spatial adaptability
- zoning and privacy
- work compatibility
- indoor-outdoor relationship
- transformability without major construction intervention

This framework is necessary because the two cases are not comparable through size or market segment alone. HKS deals with spatially constrained studio and one-bedroom typologies in the U.S. multifamily context [12], while AKVS includes more spacious apartments within a Belgrade project that explicitly links luxury to freedom of use [15]. What makes them comparable is not typological identity, but the fact that both address the same architectural problem: how can the apartment support changing and overlapping life patterns without losing residential quality? The comparison is therefore structured around response to change rather than superficial similarity.

2.2. CASE STUDY 1: HKS / POST-PANDEMIC MULTIFAMILY LIVING

HKS is an international architecture and design firm founded in 1939 in Dallas, with extensive work across architecture, interiors, planning, and large-scale residential typologies [12]. The relevance of the HKS case for this research lies less in the office's general prominence and more in the specificity of the 2020 material selected for analysis. In "How Design Will Shift to Accommodate Post-COVID-19 Multifamily Living," HKS reworks apartment layouts from previously proposed multifamily projects in major cities in order to test what kinds of changes might become necessary under post-pandemic conditions [12].

The article is particularly useful because it does not discuss flexibility in abstract terms. Instead, it presents concrete plan scenarios for studio, one-bedroom, and two-bedroom units, along with reflections on balconies and new domestic routines. HKS argues that designers should incorporate details that make it easier for tenants to live, work, and learn together in their homes [12]. This makes the case especially valuable for the present paper because it connects housing design directly to changing everyday patterns, rather than treating post-pandemic life as a purely sociological phenomenon.

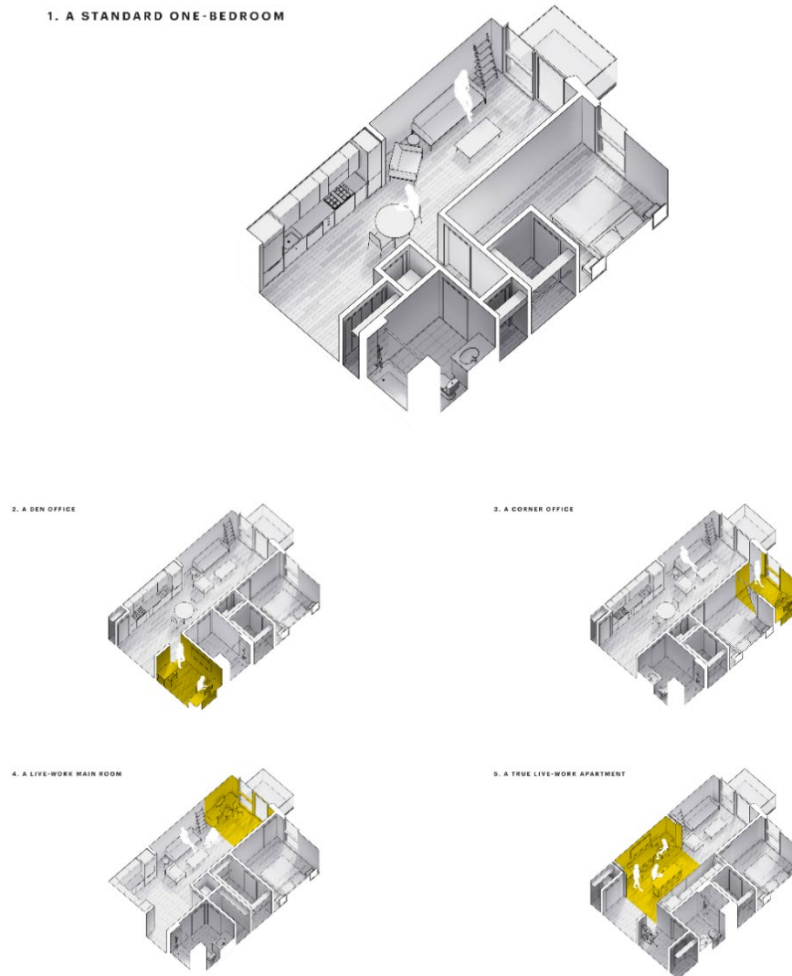


Figure 3. One bedroom apartment layouts [12]

For the purposes of this research, the analytical emphasis is placed primarily on the studio apartment, the one-bedroom apartment, and the balcony as an exterior extension of domestic space. These are the most relevant parts of the HKS material because they address common urban typologies under spatial pressure. Studios and one-bedroom units are among the most common apartment formats in dense housing markets, and they are also among the most vulnerable when domestic functions expand. In such units, even small changes in spatial organization can have disproportionate effects on daily comfort, privacy, and work feasibility.

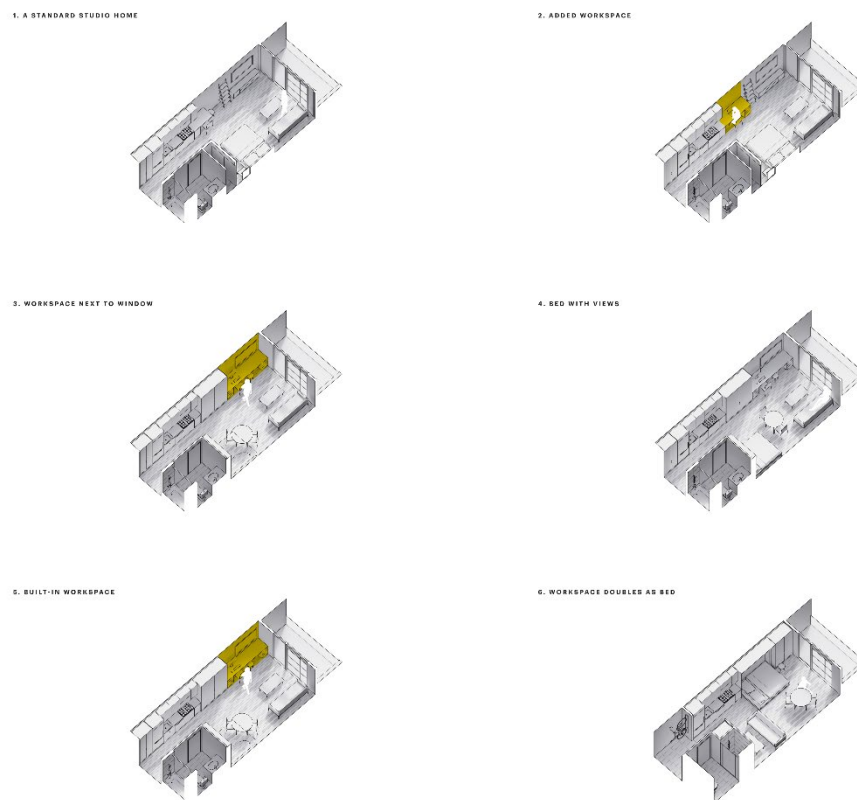


Figure 4. Studio apartment layouts [12].

The one-bedroom layouts presented by HKS are useful for examining how much flexibility can be extracted from a plan structured by a fixed service core. They show different possible insertions of a workspace into the apartment, but also reveal the constraints imposed by kitchens, wet cores, circulation routes, and façade access [12]. The studio layouts, by contrast, show the limits of flexibility under maximum compression: the apartment has only one primary space, which must host living, sleeping, dining, and work. Finally, the balcony examples expand the discussion from interior arrangement toward the question of environmental relief and the apartment's relationship to the outside. Even when represented somewhat illustratively, these scenarios point toward the renewed significance of private outdoor extensions under conditions of prolonged indoor occupation [12].

The HKS case study is therefore not treated in this paper as a complete architectural project to be praised or criticized as a whole. Rather, it is used as an analytical dataset that reveals how post-pandemic flexibility is imagined and tested within the logic of compact multifamily housing. It provides an example of flexibility as pragmatic optimization: the apartment remains constrained, but the plan is pushed toward greater adaptability.

2.3. CASE STUDY 2: AKVS / SLAVIJA-MANEŽ RESIDENTIAL COMPLEX

The second case study is the Slavija-Manjež residential-commercial complex by AKVS architecture in Belgrade, a first-prize competition entry from 2021 [15]. AKVS is a Belgrade-based architectural practice whose work engages with contemporary urban and residential questions through a strong emphasis on spatial quality, contextual sensitivity, and conceptual clarity. Their projects often explore the relationship between architectural form, everyday use, and the broader urban environment, making their work particularly relevant for discussions of housing and adaptability. The project description is especially rich for the present topic because it explicitly frames housing quality through transformability and "freedom of use." Unlike the HKS case, which focuses on adjusting compact apartment layouts to new post-pandemic realities, the AKVS project develops a more conceptually integrated and architecturally ambitious strategy in which the loggia becomes a key spatial device.

According to the official project description, the project starts from two conditions: the complex urban context of Slavija Square and the need to secure a high quality of living for each apartment [15]. Within that framework, AKVS proposes that luxury in housing is not defined only by size,

view, or location, but by the freedom of use of space [15]. This conceptual shift is highly relevant for a paper on flexibility because it transforms adaptability from a reactive necessity into a positive architectural value.

The most important element of the case is the “large transformable loggia in the heart of the living area of each apartment,” which, according to AKVS, allows a range of spatial transformations depending on individual needs, seasonal shifts, and even unusual or “exotic” wishes [15]. The project further explains that the loggia is glazed with sliding butterfly panels in opaque glass toward the apartment interior and bi-fold windows toward the exterior, enabling multiple configurations of openness and enclosure [15]. In addition, AKVS describes the apartments as spacious, double-oriented, sunny, and naturally ventilated, with minimal communication space and a strong emphasis on usable living area [15]. For the purposes of this paper, the AKVS case is analyzed through two main themes. The first is the loggia as a transformable intermediate space—a climatic, spatial, and social filter between interior and exterior. The second is the notion of freedom of use as a definition of housing quality, or even luxury. These two themes make the case especially useful in relation to the broader theoretical framework of flexible housing. Whereas HKS shows how a conventional compact plan can be adjusted to meet new demands, AKVS proposes a dwelling in which transformability is embedded in the concept itself.



Figure 5. Loggia - key element of the project [15].

The case is also regionally important. Since the paper is written from the perspective of housing discourse relevant to Serbia and the wider Balkan context, AKVS provides a domestic example that demonstrates that flexibility is not only an imported or globally fashionable concept. It can also emerge from local architectural practice as a serious response to dense urban living, changing domestic patterns, and the search for more open and adaptable housing models. For an international audience, the project additionally introduces a geographically specific but conceptually transferable example of how loggias can become central elements in the organization of contemporary apartments.



Figure 6. Loggia - celebration scenario [15].

3. A COMPARATIVE EVALUATION AND DISCUSSION OF THE CASES

3.1. SPATIAL ADAPTABILITY

The first and most fundamental comparative criterion is spatial adaptability: the degree to which a dwelling can shift between modes of use without major construction works. Here the two case studies reveal two distinct but related strategies.

In the HKS case, adaptability is achieved through micro-zoning within constrained plans. The apartment does not undergo radical transformation; rather, certain domestic zones are reassigned or extended in order to host work or study. The fixed service core remains the governing element, and the capacity for change depends largely on how much “soft” area remains around it [12]. In the one-bedroom layouts, the office can be placed in more than one position, but each arrangement produces trade-offs involving circulation, façade access, daylight, or privacy. In the studio layouts, the scope of adaptation is even more limited. The apartment can host multiple activities, but only by layering them onto the same spatial field.

This form of adaptability corresponds closely to what Schneider and Till describe as a more indeterminate or user-led flexibility, where a space is able to support different occupations without necessarily being physically rebuilt [16], [17]. HKS does not propose a highly transformable architecture in the mechanical sense; instead, it proposes a more permissive plan logic. The apartment remains relatively ordinary, but its domestic zones are made more open to reinterpretation.

AKVS, by contrast, operates through a stronger and more architecturally explicit spatial device. The transformable loggia adds a new layer of domestic possibility rather than merely rearranging existing surfaces [15]. Because it can open and close in different combinations toward interior and exterior, it acts as an intermediate zone whose role changes according to season, atmosphere, and daily use. This means that flexibility is not only extracted from the leftover capacity of the plan, but actively designed into the identity of the dwelling.

The comparative lesson is important. HKS demonstrates that flexibility can and must be pursued even within ordinary and compact apartment formats. AKVS demonstrates that flexibility becomes more robust when it is not treated as a secondary adaptation, but as a generator of the spatial concept itself. The former is a model of optimized flexibility; the latter is a model of embedded transformability. Both confirm the broader theoretical insight that adaptability depends on the relation between stable and changeable layers of housing organization [18], [19].

3.2. ZONING, PRIVACY, AND ACOUSTIC CONDITIONS

The second comparative criterion concerns zoning and privacy, including the apartment's capacity to separate incompatible activities. This issue became central during the pandemic because domestic space had to support simultaneous work, study, care, rest, and household routines. Research consistently shows that lack of privacy and sound control negatively affects concentration, comfort, and well-being in remote work conditions [6], [7], [8], [9].

The HKS case reveals how difficult this problem is in compact typologies. In one-bedroom units, some degree of functional separation can be achieved because the bedroom provides at least one enclosed room. Yet even there, the work zone often remains exposed to everyday circulation or competes with the main living area. In some proposed arrangements, placing the workspace near daylight improves work comfort but pushes the bedroom deeper into the plan, potentially weakening environmental balance [12]. In other arrangements, the work area is spatially convenient but loses privacy because it becomes part of the most public zone of the apartment. The result is not a clean division between domestic and professional life, but a negotiated coexistence.

The studio apartment exposes the limits of such coexistence even more starkly. There is no meaningful spare room, and the same space must host sleeping, socializing, work, and daily domestic tasks. In such a condition, true zoning becomes nearly impossible. What remains is temporal zoning, furniture-based differentiation, and behavioral negotiation. This corresponds closely to the findings of Milián Bernal et al., who describe how homeworkers "appropriate" domestic space through tactics rather than through architecturally guaranteed separation [8]. HKS can therefore be read as a practical demonstration of the threshold beyond which flexibility becomes fragile because the apartment lacks sufficient depth or redundancy.

AKVS performs differently on this criterion, not simply because its apartments are larger, but because the loggia introduces an additional gradation of space. The transformable loggia is not a fully independent room, yet it provides a spatial buffer that can moderate relationships between activities [15]. Its capacity to open, close, filter, and extend means that the apartment does not rely only on the binary opposition of room versus corridor, or bedroom versus living room. Instead, it gains an intermediate zone that allows a more nuanced zoning structure. This is architecturally significant because post-pandemic housing often requires not absolute enclosure, but variable thresholds and degrees of retreat.

Acoustically, neither case provides detailed technical data, and this must be acknowledged as a limitation. Yet both imply the importance of sound buffering. In HKS, the search for a dedicated work position is driven partly by the need to escape interruption. In AKVS, the loggia's role as a controlled membrane suggests not only environmental modulation, but also a degree of atmospheric separation. Therefore, while the paper cannot claim to have measured acoustics in either case, it can reasonably conclude that zoning and flexibility in both examples are indirectly linked to acoustic resilience. The comparative insight is that post-pandemic apartment design requires more than openness; it requires the possibility of selective separation.

3.3. WORK-COMPATIBLE DOMESTIC SPACE

The third criterion is the capacity of the apartment to support work-compatible routines. This issue is especially important because the transformation of domestic space during the pandemic was not limited to generalized "multifunctionality"; it was driven very concretely by the need to perform work and study from home. Work at home requires surfaces, light, digital infrastructure, a certain degree of quiet, and the ability to maintain some symbolic and practical distinction between focused work and ordinary domestic life [6], [7], [8], [10], [11].

HKS addresses this question directly and explicitly. The firm's article is fundamentally about how apartment layouts might shift so that tenants can live, work, and learn together in their homes [12]. The one-bedroom examples explore different positions for the office within the dwelling, and the studio examples suggest how a work zone can be inserted into a multifunctional room without eliminating core domestic functions. This is a valuable contribution because it recognizes work-compatible domesticity as a legitimate planning requirement rather than a temporary improvisation. However, the HKS case also shows the limits of such accommodation. The workspace often remains auxiliary rather than fully integrated. It is inserted into already standardized zones rather than designed as a primary component of the typology. In this sense, HKS reveals the tension between market-standard apartment production and the new expectations of hybrid life. The units can be adapted, but their capacity to support sustained work remains vulnerable to conflicts of privacy, light distribution, and room hierarchy.

AKVS addresses the same issue less directly, but not less meaningfully. The project description does not foreground the home office as the central theme, yet the transformable loggia and large living spaces provide a domestic environment more compatible with varied modes of work, retreat, and daily reinterpretation [15]. The loggia's adjustable openness, filtered light, and ability to operate as a semi-integrated extension of the living area create conditions in which temporary focused activity—whether work, reading, or quiet individual use—becomes spatially more plausible. Thus, while HKS offers an explicit work-from-home agenda and AKVS a broader transformability agenda, both contribute to the same conclusion: the contemporary apartment should be able to host at least some forms of productive activity without collapsing into spatial confusion.

The deeper architectural lesson is that work-compatible space should not always be understood as a separate room. In compact apartments, that will often be impossible. Instead, what matters is whether the apartment contains zones that can temporarily intensify into focused-use areas without undermining the entire domestic organization. HKS and AKVS offer two different versions of this possibility: inserted workspace and buffered transformable workspace. Both are relevant to post-pandemic housing, though they operate at different spatial scales and levels of architectural ambition.

3.4. INDOOR-OUTDOOR RELATIONSHIP: BALCONY VERSUS LOGGIA

The fourth comparative criterion concerns the relationship between interior and exterior, specifically the role of the balcony or loggia as a mediator of domestic quality. This dimension became much more significant during the pandemic because private outdoor space often served as the closest available substitute for public openness, movement, environmental variation, and micro-social contact.

In the HKS case, the balcony appears as a necessary extension of the apartment under conditions of confinement [12]. Even when represented in somewhat illustrative ways, the message is clear: where interior square footage is limited, the balcony expands the effective domain of the dwelling. It offers fresh air, daylight, a view, a brief change of bodily orientation, and the possibility of stepping outside without leaving home. In compact units, these functions are especially important because the interior often lacks enough variety of atmosphere and posture. The balcony therefore becomes part of the apartment's environmental resilience.

Research supports this interpretation. Peters and Masoudinejad argue that balconies are often underestimated as design elements capable of improving dwelling adaptability and everyday residential quality [13]. They show that the balcony's value lies not simply in being "extra space," but in being a semi-outdoor zone that residents can use and interpret in different ways. This is directly relevant to the HKS case, where the balcony compensates for the weakness of interior differentiation.

AKVS pushes this logic further by transforming the balcony-type element into a central architectural device. The loggia in Slavija-Manjež is not simply attached to the façade; it reorganizes the apartment through its intermediate, transformable character [15]. It can be read as a climatic chamber, a semi-open room, an extension of the living area, and a filter between urban exterior and domestic interior. In Masoudinejad's terms, it functions powerfully as a "home boundary," shaping the resident's connection to nature, social life, and the outside world [14]. It does not merely add comfort; it becomes part of the apartment's spatial intelligence.

The comparison between balcony and loggia is therefore not only a matter of size or enclosure. It is a difference in architectural intensity. In HKS, the balcony extends domestic life outward and improves the apartment's tolerance for confinement. In AKVS, the loggia becomes a central mechanism of transformability and a generator of multiple domestic atmospheres. The comparative conclusion is that indoor-outdoor mediation is not an optional luxury in post-pandemic housing. It is one of the main ways the apartment maintains contact with environmental variation and psychological relief under intensified use.

3.5. DISCUSSION: LIMITS, DIFFERENCES, AND TRANSFERABLE LESSONS

The comparison of HKS and AKVS confirms the central hypothesis of this paper, but it also reveals important nuances. First, flexibility is not the same thing across all apartment types. In compact units, such as those explored by HKS, flexibility is often a matter of damage control and optimization. The goal is to fit more uses into limited space without making the apartment unlivable. The strategies are necessarily modest: shifting functions, intensifying the façade edge, using furniture and layout adjustments, and relying on balconies as supplementary space [12].

In AKVS, flexibility is not primarily compensatory. It is presented as a positive spatial quality in its own right. The transformable loggia does not simply solve a lack of space; it creates a richer mode

of inhabitation [15]. This difference matters because it shows that flexibility is relevant across the housing spectrum. It is not only a strategy for small or economically constrained apartments, but also a criterion of higher housing quality and architectural sophistication.

Second, the comparison shows that the relationship between fixed services and adaptable zones remains fundamental. HKS makes this visible through the difficulty of relocating functions beyond the hard infrastructural core. AKVS makes it visible through the strategic concentration of communication areas and the freeing up of living space around the transformable loggia [15]. In both cases, the apartment's capacity for change depends on how the rigid layer has been organized. Third, the comparison suggests that transitional spaces matter more than conventional room counts. A dwelling may have several rooms yet remain inflexible if each is narrowly overdetermined. Conversely, a dwelling with fewer but more open and gradated zones may better support changing routines. The loggia in AKVS and the balcony in HKS both demonstrate that the apartment boundary can function as a critical layer of adaptability.

Finally, the comparison also clarifies the paper's limitations. The two cases do not represent the whole field of post-pandemic housing, and they do not offer equivalent levels of technical data. The paper therefore does not claim to provide exhaustive performance evaluation. Rather, it argues that these two cases, read through a shared framework, illuminate different architectural routes toward the same goal: making the apartment more capable of absorbing the instability of contemporary life.

4. THE RESULTING SPATIAL PRINCIPLES AND CONCLUSION

4.1. RESULTING SPATIAL PRINCIPLES FOR THE FLEXIBLE APARTMENT

Spatial adaptability

The dwelling should be conceived as a system capable of shifting between modes of use without structural reconstruction. In compact apartments, this means preserving enough neutral and non-overdetermined space to allow reconfiguration through furniture arrangement or changing patterns of occupation, as demonstrated in the HKS examples [12]. In more conceptually articulated housing, adaptability can be embedded directly into the spatial concept through transformable zones, as seen in the AKVS loggia [15]. This principle is supported by Schneider, Till, and Habraken, who argue that housing should accommodate change rather than permanently fix everyday life into a single, predetermined scenario [16], [17], [18], [19].

Zoning and privacy

The apartment should provide at least some degree of separation between incompatible activities. Work, study, household routines, leisure, and rest cannot always take place simultaneously in the same undifferentiated field without friction. The HKS case reveals how difficult this is in compact apartments, especially in studio units [12]. The AKVS project suggests that intermediate and transformable zones can improve privacy without relying on a rigid multiplication of enclosed rooms [15]. Flexibility therefore depends not on unrestricted openness, but on the ability of the dwelling to alternate between continuity and enclosure according to changing daily needs.

Acoustic resilience

Acoustic quality is an important component of residential comfort in multifunctional housing. The search for work-compatible areas in HKS and the buffering role of the transformable loggia in AKVS both point to the need to reduce interference between simultaneous activities [12], [15]. Flexible apartment design should therefore address not only visual and functional zoning, but also the acoustic consequences of domestic multifunctionality. Spatial depth, soft separators, strategic room positioning, and appropriate material treatment all contribute to this capacity.

Indoor-outdoor mediation

Balconies and loggias should be understood as active components of dwelling quality rather than optional additions. In HKS, the balcony extends the usable and restorative range of the apartment [12]. In AKVS, the loggia becomes a central device of transformability and environmental mediation [15]. Research on balconies as adaptable residential spaces and on the concept of the home boundary confirms that access to fresh air, daylight, exterior views, and semi-outdoor occupation contributes significantly to well-being and resilience [13], [14].

Everyday environmental quality

Prolonged domestic occupation increases the importance of daylight, ventilation, natural airflow, visual permeability, and the possibility of short environmental retreat. HKS emphasizes the value of façade-adjacent workspaces and balconies [12], while AKVS highlights double orientation, natural ventilation, sunlight, and the modulation of interior atmosphere through loggia configurations [15].

The apartment should therefore be designed to support extended occupancy without producing sensory fatigue, confinement, or environmental discomfort.

Taken together, these principles show that the flexible apartment is not defined by a single formal solution. It may emerge through the optimization of compact units, through transformable intermediate spaces, through better threshold design, or through a greater neutrality of interior organization. What unites these approaches is the understanding of the apartment as a changing framework for living rather than as a static container of predetermined functions.

4.2. CONCLUSION

This paper started from the assumption that the flexible apartment is not merely a temporary post-pandemic design trend, but a valid contemporary housing paradigm grounded in a much longer architectural tradition. The theoretical framework showed that flexibility has long been recognized in housing discourse as a question of adaptability, indeterminacy, open building, and user-oriented change [16], [17], [18], [19]. The pandemic did not create this issue. It exposed the everyday consequences of ignoring it.

The methodological structure of the paper was designed to respond directly to that insight. Instead of treating the pandemic only as a historical narrative or the case studies only as isolated examples, the research combined literature review, case-study description, and explicit comparison. This made it possible to examine not only what post-pandemic housing requires, but also how different architectural strategies respond to that requirement.

The HKS case study demonstrated how flexibility operates under strong spatial constraints. In studio and one-bedroom units, the workplace is rarely developed as a separate room; it is inserted into domestic zones that must already support other routines [12]. This makes the apartment's usability dependent on zoning, façade access, and the possibility of even partial environmental and acoustic differentiation. The AKVS case, by contrast, demonstrated a more architecturally integrated approach in which the transformable loggia becomes the central mechanism of adaptability, environmental modulation, and freedom of use [15]. Whereas HKS illustrates the minimum strategies required to make compact housing more resilient, AKVS shows how transformability can become the generator of housing quality itself.

The comparative analysis confirmed the paper's hypothesis. The apartment functions better as contemporary everyday infrastructure when it is capable of absorbing overlapping routines through adaptable spatial organization, controlled thresholds, stronger indoor-outdoor mediation, and more nuanced privacy conditions. The flexible apartment is therefore not simply one typology among others. It is an architectural response to a condition in which housing must support a wider range of life patterns than before. In post-pandemic terms, residential quality can no longer be evaluated only through room count or floor area. It must also be measured through the apartment's capacity to change, to host multiple scenarios, and to remain livable when everyday life becomes unstable.

For that reason, the broader contribution of this paper lies not only in its reading of the selected cases, but in the argument that flexibility should be treated as a central criterion in future apartment design. Whether achieved through modest plan adjustments, more neutral room organization, better balcony design, or architecturally ambitious intermediate spaces such as the transformable loggia, flexibility directly influences comfort, privacy, environmental quality, and well-being. As urban life continues to evolve under the pressures of digitization, demographic change, and high-density living, the apartment must be able to do more than contain domestic functions. It must be able to adapt to life itself.

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