A New Inclusive Housing Model for Sustainable Actions in Recycling Buildings

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1 Innovative Housing and Intervention Strategies in Progress in Europe

The consequences of aging relating to a large part of the population are manifold both for the radical change in the vision and conception of the elderly and for the renewed interest in investing in various areas of society that contemplate social well-being and healthcare. The social awareness of aging in the elderly population has radically evolved over the last few decades, both due to the radical change in the vision of the elderly and to the renewed interest in investing in the many areas of society that involve social well-being and healthcare.

In the late 1990s, the World Health Organization had introduced a positive concept of healthy and active aging, defining it as "a process that allows individuals to realize their potential for physical, social and mental well-being throughout the entire course of existence and to take an active part in society, while providing them with adequate protection, safety and care when they need assistance" [1]. In active aging, all the prevention measures that can be used to defend the functional limitations of the individual play a fundamental role; despite this, it should be noted that longevity and nonself-sufficiency are not necessarily connected by a cause-effect relationship between them; therefore, greater attention and awareness of the issue can lead to a promotion of active aging by all the operators called involved, not only the direct elderly concerned.

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It should be emphasized that within the new reference paradigm, different forms of assistance can be identified, mostly added to renewed forms of residential care and home care. Residential care is mainly linked to all those structures – public or private – that provide residential services of a social healthcare type, among which common characteristics can be recognized as regards the type of building, the functional organization, and the type of service offering; domicile has rather heterogeneous characteristics: for the type of user, for the composition of the family unit, for the conditions of accessibility, and for the type of service requested.

A series of measures for the "senior" category [2] are in progress in Europe through residential- and home-based trials to support the considerations on the topic of active aging. The underlying assumption is common: aging is not a purely personal phenomenon but also concerns and involves the urban context in its continuous relationship with individuals and the social environment that characterizes it.

The strategies identified in Europe, for senior users who are still self-sufficient or partially self-sufficient, can be summarized in the following residential models: multigenerational residences, residences with services, and subsidized construction.

Multigenerational residences provide for the cohabitation, in the same building complex or district, of people belonging to different age groups: the most common generational combinations are those that provide for the cohabitation of seniors and students. This type of residence builds a network between young and old people made up of relationships and mutual assistance, with the aim of promoting common activities toward mutual support and learning. The goal is to "build" a community such as to guarantee individual and mutual sustenance: the activities that take place within the complexes or the services available to the building itself depend heavily on personal initiative and the availability of individual inhabitants. The model is widespread in several European countries, including Germany, France, and Belgium. If in Belgium and France above all the actions to promote the model by associations and institutions deserve attention, for Germany the phenomenon must be seen within a more articulated system: the funding program, started in 2006 and resumed in 2017, by the German Federal Ministry for the Family, the Elderly, Women, and Youth – *Bundesministeriums für Familie, Senioren, Frauen, und Jugend* – with the objectives of intergenerational work, voluntary involvement, and social assistance at the local level. The broad scope of the program is to provide funding through an integrated system of European, national, and local funds for the construction of the *Mehrgenerationenhauser*, homes dedicated to users of different age groups [3].

Résidence Service Senior – residences for self-sufficient elderly with services to support daily life – is also very widespread [4]. This type of residence, although it arises from a standardized housing model – multifunctional building consisting of residential units and community spaces – can be implemented with customized superstructures of services, among which: basic services (availability of independent accommodation, reception and emergency service H24, ordinary maintenance), supplementary services (domestic assistance, catering, personal care), and à la carte

services (at the request of the user according to occasional and short-term needs). An innovative housing format is based on the quantity and type of services offered and type of accommodation. Many operators-managers in the real estate sector have invested and continue to invest in this sector: among those, we can mention the Dometic Group and the Cogedim Group [5].

Despite the declared specificity for the senior target, we are faced with residences that differ little both from a functional and typological points of view, from ordinary homes; this is a trait that distinguishes them from all those residential forms designed for the elderly with heavy medical-health repercussions.

In Spain and particularly in Barcelona, the *viviendas* deserve a mention *dotacionales*. We are faced with "hybrid residential complexes" [6], which generally house services for the district on the ground floor and accommodation and common areas on the upper levels (meeting rooms, common laundries, medical centers, libraries, etc.). The users are self-sufficient, i.e., over 65 people, and the access method provides for the payment of a controlled rent plus a complementary fee for maintenance. This type of housing is provided in many social programs which involve various entities such as the *Consorci Metropolità de l'Habitatge* and the *Agencia de l'Habitatge de Catalunya*. In addition, a decisive role is played by consortia of service companies which, through the involvement of specific areas of the metropolitan area of Barcelona, are involved in enhancing services and housing policies, helping to improve and accelerate interventions in terms of increase in the availability of housing. The final product is like residence with services of the French case, but with a public management, since the accommodations are part of the *vivienda protegida* and are often an integral part of urban redevelopment and regeneration projects.

In terms of social housing, Italy also deserves a mention with the so-called integrated fund system (SIF). The integrated system of funds constitutes one of the lines of the national housing plan [7], which provides a series of measures aimed at increasing the real estate assets to be implemented with the involvement of public and private capital to be allocated to disadvantaged social categories. These measures have as their objective the construction of affordable housing, intended for the so-called gray band, that is, families who are unable to meet their housing needs on the market but who have incomes higher than those that give the right to allocations of the public housing. Elderly people, generally self-sufficient, are also included in this "bracket," who can benefit from a rent-controlled accommodation compatible with their needs. In addition to the offer proposed by the social programs, in Italy, there are a series of housing solutions aimed almost exclusively at the elderly – generally over 65 – who are self-sufficient. These solutions, although with some slight differences based on the regions they belong to which define their requirements, are characterized by the coexistence of private accommodation served by spaces for common activities and complementary services and can have a double declination: hotel or residential type.

2   Senior Housing: Limits and Potentialities

The development of this research verified that, beyond the different declinations that the housing solutions investigated have – single renting or multigenerational cohabitation – the strategies in place in Europe are giving rise to a complex residential system that is widely shared and replicated: the residence with services for senior users, now commonly known as senior housing. Although with different definitions depending on the country of origin, RSS (senior service residences), residences for the elderly, and *vivienda dotacional*, the contents remain unchanged: all the solutions offered are, in fact, made up of a set of accommodations designed and built for elderly users, equipped with a series of services – basic or ancillary – that can be provided both to the users of the residences and to the inhabitants of the urban area in which they are located.

The integration of the residence with the services [8] can be seen on a double point of view: an internal one that allows to grasp the integration of the services with the accommodation and an external one that contemplates the system of relations between the residence considered in its complexity – accommodation and services – and the territory in which it is located. The buildings, in fact, are generally located in central areas, in any case not isolated, connected by urban infrastructures – bus and underground lines – and in areas served by commercial activities and other services useful to the person, such as post offices, bank branches, community health services, and religious services. The connection with the urban context is a feature common to many structures, regardless of the geographical area to which they belong: it can be considered a sine qua non of these innovative residences and, at the same time, the implementation of the objective, by the promoters, to not to eradicate users from their habits and lifestyles.

The only differences between the housing solutions identified can be seen in their methods of realization and in the methods of access for users; in fact, if in Italy and Spain the question of the elderly is seen above all from a social point of view, giving priority to situations of previous fragility and offering new opportunities for housing and social inclusion, in France, the RSS seem to have exceeded the limit imposed by social residences to offer itself as a semi-hotel service open to all, delegating its offer of services to the free choice of the individual user.

The analyses of the different European contexts thus allowed us to arrive at two considerations as follows:

- In the European situations examined, the various housing solutions refer above all to national programs aimed at social inclusion and the promotion and protection of active aging. From this derive a series of regulations that regulate its functioning and define its requirements: the proposed housing model includes the coexistence of private accommodation and common spaces; in most cases, they are not exclusively intended for users over 65 but are intended for various social categories such as, as in the case of Germany, students. In the countries analyzed, it emerged that the management of these structures can be both public and private, regulated by regulatory bodies that define the requirements, access

methods, and operation. It also emerged that in some cases, such as in France, there are also quality certifications, recognized to the same structures, which certify the level of comfort guaranteed based on the services offered and the services provided.

- In Italy, the framework of housing solutions aimed at self-sufficient users over 65 is quite heterogeneous from an organizational point of view as their functioning, as well as the methods of access, depends on regional regulations that define them: performance, general organizational requirements, structural and functional requirements, and characteristics of the personnel and the organization. In any case, there are some features in common between the various types proposed, to define a housing model essentially consisting of private accommodation in the form of mini apartments – one-room or two-room apartments – intended for a maximum of four people served by common areas to carry out social activities or simply to be made available to the inhabitants and, in some cases, to the entire citizenship. In the accommodations and common areas, the accessibility requirements for fragile users are also guaranteed and can be equipped with video surveillance systems and safety, and they can be included in telemedicine and tele-assistance programs. Although with slight differences, these structures are generally accredited with the regional local health authorities and can be both privately managed and part of public housing programs with social purposes.

Basically, the housing typology constituted by the coexistence of private accommodations and community spaces is now widely experimented, differentiating itself by type and quantity of services offered: this aspect can be useful for systematizing the requirements of these structures, an operation that would in any case be partial if in the complete analysis the connections with the context in which it is inserted – block, neighborhood, and city – and, above all, the relations with the proximity services are omitted.

The definition of an open and implementable model seems to be a necessary consequence of the desire to systematize all the components that converge in the process of civilization of living, aimed at senior users, which contemplate the needs of all the operators involved, methods and means to satisfy them, the requirements to be processed in terms of output, and the system of relationships at different levels that allows its functioning.

3   Toward the Definition of an Open Housing Model

The first assumption of the research, from which we started for the first definition of the model, was precisely the limit of the experiences analyzed: in general, the coexistence of accommodation and common spaces for activities takes place within the same building that in some cases, it may have services nearby with only partial involvement of the context in which it is inserted.

This aspect makes the experimentation closed, relegating a specific category of users to a single building, a solution not far from the already consolidated healthcare residences. Once again it "closes" the system in a "top-down" rather than "bottom-up" organization of life. Furthermore, the 65-year limit, reasonably common in Italy and Europe, must not be considered as a separator that separates the "young" from the "elderly." Rather, it must be seen as a stimulus to the search for new design criteria aimed at considering the evolving needs of the first category and the changing needs of the second.

Hence, there is a need to define a new management model of the housing process through the development of a model that has as its main components the operators involved and their needs, the tools and subprocesses to satisfy them, the potential solutions offered by the internal and external contexts, and, finally, the physical components into which they translate. The model thus defined can take the form of a design guideline, figuring in this case as a "content," or it can become a design matrix, taking on the characteristics of the "container," usable both in the case of new interventions and in contexts of already consolidated urban areas.

The model developed in the research does not represent only a systematization of components and relationships but aspires to be used and included in broader programs such as those aimed at promoting sustainable and integrated development of urban areas, urban regeneration, enhancement historical centers, and the protection of internal areas, especially where depopulation is a crucial phenomenon. Referring to the latter realities, it is conceivable that the model is an operational tool to support the operations of mending fragmented urban fabrics and restoring social connections aimed at reestablishing small local communities, the founding core of urban society.

The actions that the new inclusive housing model will be able to stimulate will be seen not from the perspective of a single "elderly" user but from the perspective of an aging social community, which can represent an active element in the whole process of enhancement, qualification, and rehabilitation of the territory.

The requirements of "adaptability" and "openness" become two key points, in addition to the principles of active aging, capable of amplifying the concept of "residence for self-sufficient elderly" to the point of making it take on the more general meaning of "residence for an aging society." To do this, it is necessary to operate on three different levels: respond to the changing needs of the predetermined target of users, foresee future needs and solutions capable of responding adequately to them, and integrate these needs with those of the context in which one is inserted.

The needs expressed and those in progress constitute the foundations of a dynamic and widespread housing model in continuous change and adaptation: dynamic as it is able to adapt to changes in lifestyles and widespread as it is able to interact and connect with the housing fabric existing.

As reported in the *Manifesto* "Less is more." Manifesto for a smart society "Smart living and Smart people are two of the six axes that make up the Smart city": "The smart city is an organic city, a system of systems, which in urban space faces the challenge of globalization in terms of increasing competitiveness, attractiveness, inclusiveness by focusing on six axes – economy, mobility, environment, people,

quality of life and governance – and which through specific actions becomes a more technological, more interconnected, cleaner, more attractive, safer city, more welcoming, more efficient, more open and collaborative, more creative and more sustainable" [9].

In this sense, the development and introduction of new hi-dom technologies must also be understood within a broader context: if building automation home devices can be a valid support for daily actions, they must be inserted within a wider system, aimed not only at the strictly domestic quality of life but at the residential one in a general sense, including the social and physical context in which it is inserted.

The new residence will be designed around current needs, but assuming non-definitive, open, implementable, and customizable solutions, inserted within a hierarchically organized layout of services, which can be functional both to new users and to surrounding citizens. This model aims at improving the quality of life for all, through social inclusion and integration, functional flexibility, and transversal participation.

The definition of a residential model for the aging society, due to its characteristics of an open and implementable system, must be adaptable to any urban situation: to new housing formats as well as to new forms of service to the community, to allow the development of a city accessible and inclusive.

4   SDSH Housing Model: Present Structure and Perspectives

To elaborate the definitive structure of the housing model, the theory of visual thinking [10] was applied, according to the idea that "everything" can be "seen" from six points of view that define its quantitative and qualitative aspects, to which as many correspond ways to view them.

The application of this methodology, characterized by a logical subdivision of components, made it possible to identify, within the entire implementation process, not only the stakeholders involved during the single phases but also the classes of needs to be met and their translation into spatial and functional terms, the offer of technical and technological solutions, and, finally, the logical and connective relationships that oversee all the elements considered.

The model developed, SDSH (Senior Diffused Serviced Housing), is characterized by the following four main characteristics:

- Senior, specifically dedicated to the inclusion of users who are no longer young
- Diffused, not concentrated in a single building but spread over the urban area
- Serviced, strongly characterized by the integration of facilities to support daily activities and social life
- Housing, which provides different housing solutions designed according to the evolving needs of users who start the aging process

According to each "way of seeing" (the question words) of the theory of visual thinking, the following components represent the same in the SDSH model:

- Stakeholders (who/what): it includes all the subjects involved in the implementation process of the SDSH model (i.e., promoters, investors, designers, users, caregivers, inhabitants, managers).
- Temporal phases (when): it includes each step of the process ranging from the concept of the residential or urban complex up to its construction and management, according to the stakeholders.
- Needs and requirements (how): it includes the methodological aspects of model development, which are made up of classes of needs (i.e., usability, feasibility, compatibility, flexibility, accessibility, sociality, sustainability) and their requirements according to four fields.
- Fields and tools (where): according to the four fields (building, economic, urban, and social), it includes tools designed to meet the needs expressed by stakeholders (i.e., business plan, scheduling plan, social inclusiveness, active ageing, and so many).
- Solutions (how much): it includes the variability and multiplicity of the offer in terms of internal and external solutions referred to the main components (i.e., in the case of accommodation, one of the internal solutions could be flexible accommodation and the external one a smart accommodations, depending on its main requirements).
- System products and their relationship (why): the system of relationships and connections between all the elements involved in the implementation process centered on the single products of the SDSH (Senior Diffused Serviced Housing) model (i.e., private accommodations, relationship spaces, indoor facilities and outdoor facilities).

The definition of the theoretical housing model had a dual purpose: on the one hand to systematize all the components involved in the process and on the other hand to represent a guide and control tool for the development of the implementation process, usable by all the stakeholders.

The model defined was complex in all its components and relationships and simple in its understanding and reading: this aspect, in view of its potential evolution, will allow it to be implemented in response to the change in demand that may involve, for example, new categories of users or new stakeholders.

The scheme is a synthesis of the elements involved in the model according to the logic and groupings described above: here it is possible to note their arrangement with respect to a deductive logical order based on the theory of performance requirements.

All the components contribute to the setting of a matrix, completed by the set of relationships and connections that are established between them, which represents the graphical-analytical translation of the model.

The model has its start from the point of view of the stakeholders: each of them expresses needs to be satisfied that can be traced back to specific thematic fields which, depending on the progress of the different temporal phases – design, implementation, and management – give rise to relationships and connections.

In reading the model, the main role is played by the system of relationships and connections: these, in fact, constitute a sort of nonhierarchical map that guides the

observer – in this specific case, the stakeholders involved in the process – toward the realization of the housing product consisting of the accommodations and related services.

The final product of the utilization process of the SDSH model consists of four main components: the design of private accommodation, the design of the relationship spaces, and the layout of indoor and outdoor services.

This product can be articulated in time and space, modifying the choices and relationships between the components along the way (Fig. 1).

5   Conclusions

The definition of the widespread housing model supported by services represents the result of the first phase of the research, which was aimed both at identifying housing solutions more suitable to meet the needs of an aging society and at guiding its implementation and management process.

The next phase will consist of its digitization, to make the tool operational and to test its functioning and use by the various operators involved (stakeholders) in view of its development.

From an interdisciplinary and intradisciplinary perspective, it will be advisable to prepare a digital device accessible to all operators involved, not only in the construction process but also and, above all, in the use and management process that includes it.

The extended transversal participation expands the amount of data to be processed according to the dynamics of the relationships and connections identified. The project experimentation phase, which will involve real estate promoters, service managers, representative subjects of users, and designers, will make it possible to orient the choices and define their contents, to satisfy the needs expressed by all the operators involved in each phase.

The development of an open-source web platform at the service of the housing process presented is therefore the future objective of the SDSH model prepared: a decision-making tool based on the integration of data – input and output – to meet the needs of operators involved and define a complex product to support the development of an inclusive society that is aware of the demographic, civil, and social changes now in progress.
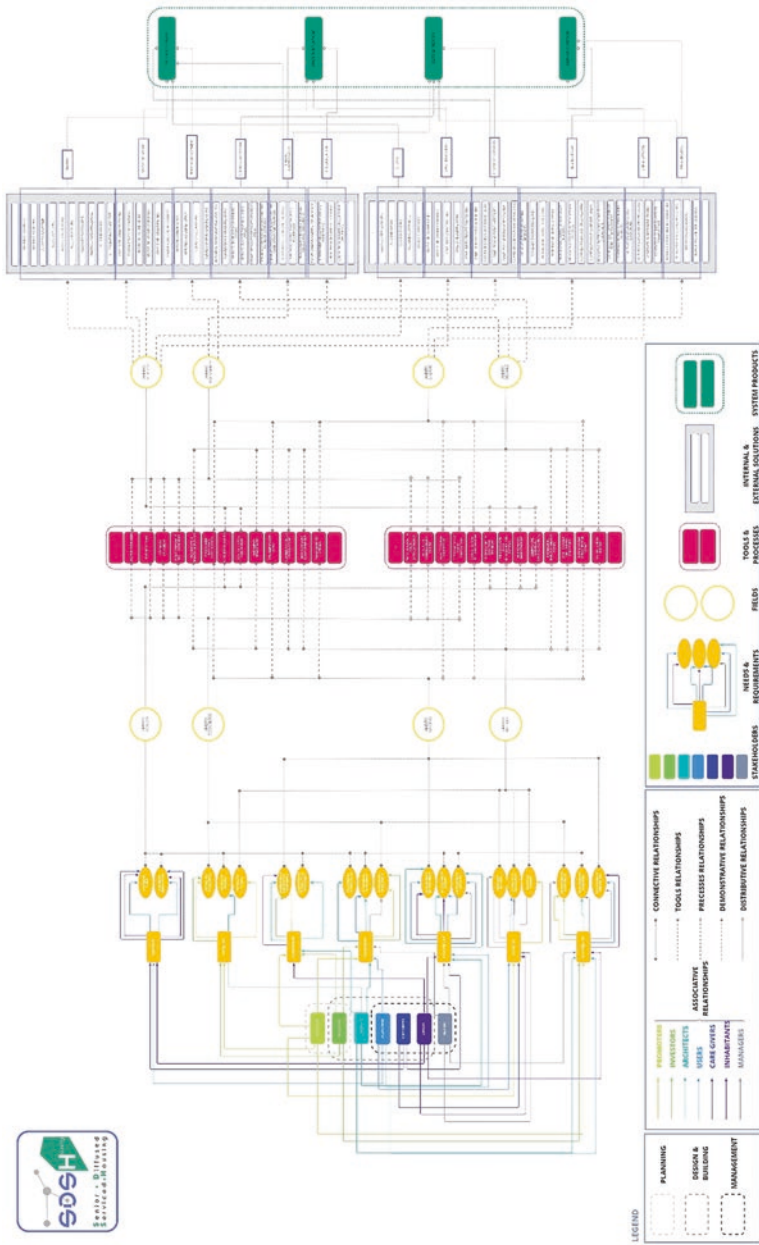
Fig. 1 Structure of the housing model Senior Diffused Serviced Housing – SDSH

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