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Rethinking the Condominium as a Digital Ecosystem:
Stakeholder Needs, PropTech Solutions, and a Design-
Oriented Concept Proposal

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Abstract

Over the past few years, the real estate sector has undergone a deep transformation driven by demographic shifts, urbanization, sustainability requirements, and rapid technological progress, which have reshaped both housing demand and the governance of residential assets. Within this evolving scenario, the condominium emerges as a fragmented micro-ecosystem of services and stakeholders, where residents, owners, condominium managers, and service providers interact through increasingly complex, yet often inefficient, organizational and communication patterns.

Starting from this premise, the thesis investigates how digital technologies and PropTech solutions can support a more integrated, transparent, and stakeholder-responsive condominium ecosystem. The research adopts a qualitative and desk-based methodology, articulated in four main steps: a review of the literature and the context of reference, the construction of an analytical framework of the main critical issues identified within the condominium context, the selection and comparative analysis of Italian PropTech case studies, and the development of a final reflection in support of a project proposal.

The findings show that the condominium is characterized by recurring cross-cutting challenges, including fragmented communication, limited transparency, weak traceability, and difficulties in coordinating multiple actors and services. The analysis also highlights that, although several PropTech solutions already address relevant needs related to communication, operational and economic management, and stakeholder interaction, they often remain focused on specific functions or user groups and therefore only partially respond to the ecosystemic complexity of condominium governance.

On this basis, the thesis proposes an interpretative framework for reading the condominium digitalization gap and advances a design-oriented conceptual proposal for a more integrated digital condominium ecosystem. While the research is limited by its reliance on secondary sources, desk-based methods, and a selective sample of cases, it contributes to repositioning the condominium as a strategically relevant field for understanding how digitalization, service integration, and residential governance can be rethought together within the broader transformation of housing.

Keywords.

Condominium ecosystem; PropTech; stakeholder needs; digitalization; real estate sector.

Abstract in italiano

Negli ultimi anni, il settore immobiliare ha subito una profonda trasformazione guidata dai cambiamenti demografici, dall'urbanizzazione, dalle esigenze di sostenibilità e dal rapido progresso tecnologico, che hanno ridefinito sia la domanda abitativa sia la gestione del patrimonio residenziale. In questo scenario in continua evoluzione, il condominio emerge come un micro-ecosistema frammentato di servizi e attori, in cui residenti, proprietari, amministratori e fornitori di servizi interagiscono attraverso modelli organizzativi e comunicativi sempre più complessi, ma spesso inefficienti.

Partendo da questa premessa, la tesi indaga in che modo le tecnologie digitali e le soluzioni PropTech possano favorire un ecosistema condominiale più integrato, trasparente e attento alle esigenze delle parti coinvolte. La ricerca adotta una metodologia qualitativa e desk-based, strutturata in quattro fasi: revisione della letteratura e del contesto di riferimento, costruzione di un quadro analitico delle principali criticità riscontrate all'interno del contesto condominiale, selezione e analisi comparativa di casi studio PropTech italiani, e sviluppo di una riflessione finale a supporto di una proposta progettuale.

I risultati mostrano che il condominio è caratterizzato da sfide trasversali ricorrenti, tra cui una comunicazione frammentata, una trasparenza limitata, una scarsa tracciabilità e difficoltà nel coordinare molteplici attori e servizi. L'analisi evidenzia inoltre che, sebbene diverse soluzioni PropTech rispondano già a esigenze rilevanti relative alla comunicazione, alla gestione operativa ed economica, e all'interazione con le parti interessate, esse rimangono spesso incentrate su funzioni o gruppi di utenti specifici e quindi rispondono solo parzialmente alla complessità ecosistemica della governance condominiale.

Su questa base, la tesi propone un quadro interpretativo per analizzare il divario di digitalizzazione del condominio e avanza una proposta concettuale orientata alla progettazione per un ecosistema condominiale digitale più integrato. Sebbene la ricerca sia limitata dal ricorso a fonti secondarie, da metodi di analisi documentale e da un campione selettivo di casi studio, essa contribuisce a riposizionare il condominio come un ambito strategicamente rilevante per comprendere come la digitalizzazione, l'integrazione dei servizi e la governance residenziale possano essere ripensate congiuntamente nell'ambito della più ampia trasformazione dell'edilizia abitativa.

Parole chiave

Ecosistema condominiale; PropTech; esigenze degli stakeholders; digitalizzazione; settore immobiliare.

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1. Introduction

Research Background and Motivation

In recent years, the real estate sector has been undergoing a deep transformation driven by a combination of demographic shifts, urbanization processes, sustainability goals, technological innovation, and changing patterns of housing demand (Tagliaro et al., 2024). These dynamics are not only redefining the physical and economic characteristics of residential assets, but are also reshaping the ways in which housing is managed, accessed, and lived. As a result, housing can increasingly be interpreted not merely as a physical product, but as a complex system of services, relationships, and organizational arrangements (Lappalainen & Federley, 2021).

Within this wider transition, the residential sector has obtained renewed strategic relevance, especially in countries such as Italy, where housing is deeply interconnected with social structure, private wealth, urban transformation, and everyday life. At the same time, multiple pressures are affecting this field, including affordability concerns, population aging, energy transition requirements, maintenance needs, and rising expectations for more efficient and responsive forms of service provision (Grassi, 2010). In parallel, digital technologies are progressively transforming several segments of the real estate value chain, opening up new possibilities for communication, coordination, monitoring, and user interaction (Sabin, 2019). However, these innovation dynamics are unevenly distributed across residential contexts. In the Italian case, the condominium represents a particularly relevant and at the same time problematic field of observation. Far from being a purely legal or administrative entity, the condominium can be understood as a complex and fragmented environment in which residents, condominium managers, and service providers interact through a plurality of interdependent activities, responsibilities, and decision-making processes (Vargo & Lusch, 2008; Lappalainen & Federley, 2021). Such interactions often take place through poorly integrated channels and are affected by asymmetries of information, low transparency, coordination delays, and recurring organizational conflicts.

For this reason, the condominium appears as a particularly significant setting in which to investigate the relationship between housing, governance, and digital innovation. Interpreting it as a micro-ecosystem of services and stakeholders makes it possible to move beyond a narrow administrative view and to explore how value is generated, negotiated, and sometimes hindered within everyday residential environment. From this perspective, PropTech and digital tools become relevant not simply as isolated technological add-ons, but as potential enablers of more integrated, transparent, and stakeholder-oriented forms of condominium ecosystem.

The choice to focus on this topic is also connected to a more direct familiarity with the condominium context, developed through proximity to residential properties managed within condominium settings and to the practical dynamics associated with rental housing. This personal familiarity has allowed me to observe how inefficiencies, communication conflicts, and fragmented responsibilities may affect all the actors involved, with consequences that extend beyond operational issues and influence both working practices and everyday quality of life. Such an initial practical awareness gradually evolved into a broader research interest: to examine the condominium context through a structured academic perspective and to explore how digital innovation could contribute to more coherent and functional forms of interaction, coordination, and service delivery within condominium ecosystem.

Research Problem

Despite the growing attention devoted to digital transformation in the real estate sector, the condominium context remains relatively underexplored in comparison with other topics such as transactions, asset and property management, smart buildings, or investment-oriented innovation.

Existing debates on PropTech field have highlighted the capacity of digital technologies to improve efficiency, data management, and user experience across different real estate processes (CRETI, 2025). However, less attention has been paid to the condominium as a socio-technical and service-based ecosystem in which complexity emerges primarily from stakeholder interdependence, fragmented governance structures, and the everyday management of shared spaces, services, and responsibilities.

This gap is particularly relevant in the Italian context, where the condominium plays a central role within the residential stock and where many critical issues arise not at the level of individual actors alone, but at the intersection between residents, managers, and service providers (ISTAT, 2025; Grassi, 2010). In this setting, the problem is not simply the absence of digital tools as such, but the mismatch between the growing complexity of condominium life and the still limited integration of the organizational, informational, and relational mechanisms through which that complexity is managed (Sabin, 2019).

Against this background, this thesis investigates how digital technologies and PropTech solutions may support a more integrated, transparent, and stakeholder-responsive condominium ecosystem. More specifically, the study examines the main needs and criticalities emerging within the condominium context, assesses how selected PropTech solutions respond to them, and uses this comparative understanding as the basis for a broader design-oriented reflection.

Scope and Structure of the Thesis

This thesis focuses on the condominium as a specific residential and organizational context within the Italian market. Its scope lies at the intersection of housing studies, real estate innovation, service ecosystems, and digital transformation. Rather than addressing the PropTech field in its entirety, the research concentrates on those digital solutions that are more directly connected to condominium governance, stakeholder interaction, service coordination, and its everyday management.

From a methodological perspective, the study adopts a qualitative, interpretative, and desk-research-based approach. It does not aim to produce statistically generalizable findings, nor to test a specific digital product through empirical experimentation. Instead, it seeks to construct an analytical framework capable of linking the broader transformation of housing, the structural and relational criticalities of the condominium context, the functional potential of selected PropTech solutions, and the elaboration of a design-oriented conceptual proposal.

The thesis is structured into six chapters. Following this introductory section, Chapter “2. *Theoretical Background: Evolution of the Real Estate Sector and New Housing Needs*” reconstructs the theoretical and contextual background by examining the main transformations affecting the real estate and residential sectors, with particular attention to the Italian and European contexts and to the progressive redefinition of housing as a service-oriented ecosystem. Chapter “3. *Research Framing and Methodology*” presents the research framing and methodology, clarifying the research problem, the research question and objectives, and the main phases of the analytical process. Chapter 4. *The Italian Condominium context: Physical Structure and Stakeholder Needs*” investigates the condominium as a socio-technical system, focusing on its structural features, the needs and criticalities of residents, the evolving role of condominium managers, and the operational ecosystem of service providers. Building on this diagnostic perspective, Chapter “5. *Digitalization as a driver of change in the condominium context*” explores digitalization as a potential driver of change in the condominium context through the comparative analysis of selected PropTech solutions, while Chapter “6. *Discussion and conceptual proposal for an integrated digital condominium ecosystem*” assesses the development of a conceptual proposal for a more integrated digital condominium ecosystem. Finally, Chapter “7. *Conclusions*” brings together the main findings of the research, discusses its limitations, and outlines possible directions for future investigation.

2. Theoretical Background: Evolution of the Real Estate Sector and Emerging Housing Needs

The theoretical framework of this thesis is developed in Chapter “2. *Theoretical Background: Evolution of the Real Estate Sector and New Housing Needs*”, which lays the conceptual and contextual groundwork for the subsequent analysis.

The objective is to contextualize the broader transformations affecting the real estate and residential sectors, identify the key dynamics that are redefining housing demand and management, and establish the interpretive framework through which the condominium can then be analyzed as a complex and fragmented ecosystem.

To do so, the chapter follows a progressive logic. Section “2.1 *New Trends and Impact on the Real Estate Sector*” examines the main external drivers currently reshaping the real estate sector, namely urbanization, demographic change, geopolitical and economic instability, sustainability goals, and technological and digital innovation. Building on this broader context, Section “2.2 *Residential Sector Evolution: National Trends and European Comparison*” focuses on the residential sector, with particular attention to the structural characteristics of the Italian market and to its positioning in comparison with selected European contexts. Section “2.3 *Redefining Housing: From Physical Space to Service Ecosystem and Stakeholders Network*” moves from a market- and stock-oriented perspective toward a qualitative interpretation of housing as a service-oriented and relational ecosystem. Finally, Section “2.4 *The condominium as a fragmented micro-service ecosystem and stakeholder network*” prepares the conceptual basis for understanding the condominium not only as a physical or legal entity, but as a fragmented system of actors, services, and governance mechanisms.

2.1 New Trends and Impact on the Real Estate Sector

From the end of World War II until the late 1990s, the real estate market operated within a relatively stable and predictable framework, driven by recurring trends and cyclical patterns that allowed for a consistent and realistic assessment of market dynamics (Ciaramella & Dall’Orso, 2021).

These market cycles, although influenced by external social and economic factors such as inflation rates, government policies, and interest rate fluctuations, maintained a discernible pattern of alternating phases of expansion and contraction, making them relatively foreseeable despite potential externalities.

As a consequence of this “stability,” real estate assets were primarily owned by the operators themselves and were planned, designed, and built to align with well-established business models. These models remained largely unchanged over time and were highly specialized to meet specific industry needs (Ciaramella & Dall’Orso, 2021).

However, in recent years, the real estate landscape has undergone a profound transformation, marked by sudden and increasingly unpredictable developments. The once well-defined trends and cyclical patterns have given way to a more volatile and uncertain market environment (Tagliaro et al., 2024). This evolving scenario is shaped by a multitude of interrelated factors that contribute to a highly dynamic and complex ecosystem. These factors, though heterogeneous and varying in impact, are pivotal in understanding both the present and future trajectory of the real estate sector. The combined effects of shifting social and economic dynamics, along with disruptive events such as the 2020 pandemic, have

accelerated substantial changes within the industry, challenging traditional business models and long-standing market assumptions.

Key drivers of this transformation are rapid urbanization processes, significant demographic shifts, the increasing demand for sustainable and low-impact solutions, the geopolitical and economic dynamics, and technological and digital innovation (Ciaramella & Dall’Orso, 2021).

The following sections therefore analyze these factors in order to clarify how they are reshaping real estate dynamics and, more specifically, how they contribute to the ongoing transformation of the Italian residential context and of housing-related needs, conditions, and organizational challenges.

2.1.1 Accelerating Urbanization

One of the most influential factors shaping the real estate sector is the ongoing process of urbanization, characterized by increasing urban migration and the continuous expansion of metropolitan areas. According to the United Nations World Urbanization Prospects: The 2018 Revision by 2050 globally, more people live in urban areas than in rural areas, with 55% of the world’s population residing in urban areas in 2018 and by 2050 the world’s population will be 68% in urban areas and 32% in rural land (*Figure 1*). Furthermore, more than two million people are expected to migrate to megacities cities (cities with over 10 million residents) by 2035 and it is estimated that the number of these megacities will be 43 by 2030 (*Figure 2*) (World Urbanization Prospects, 2019).

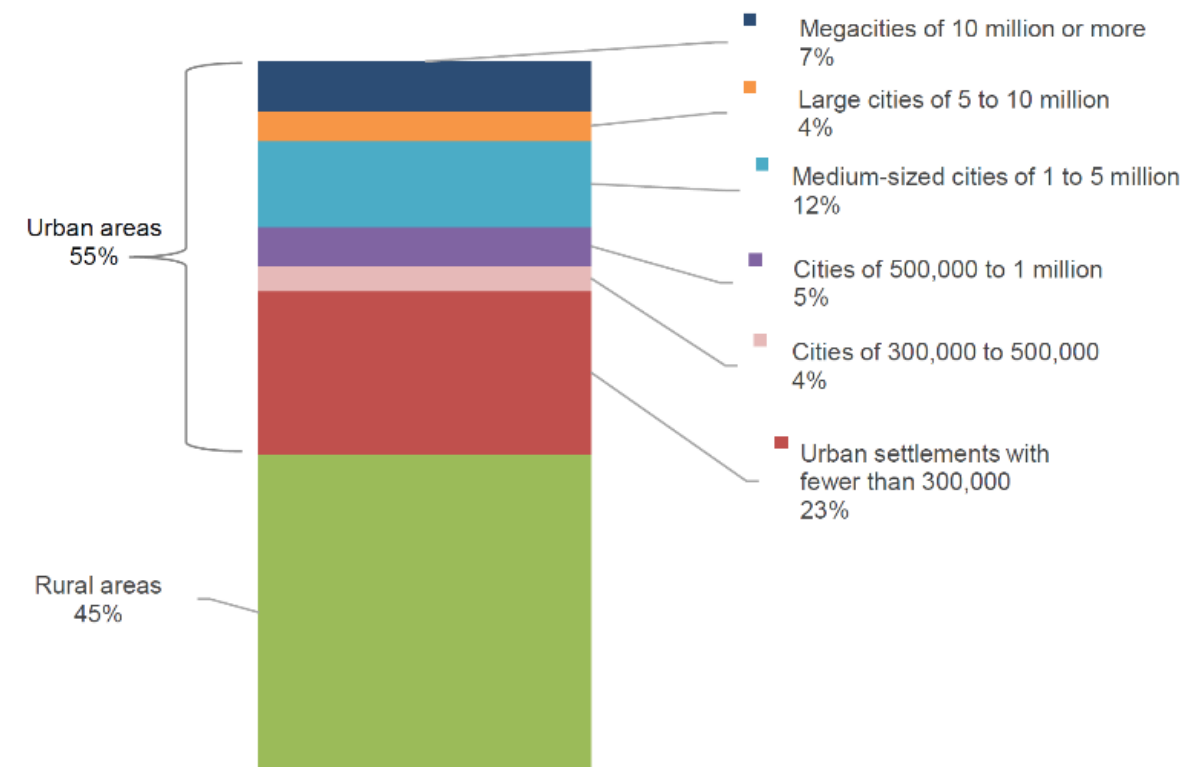


Figure 1: Population of the world, by area of residence and size class of urban settlement, 2018. Source: World Urbanization Prospects, 2019

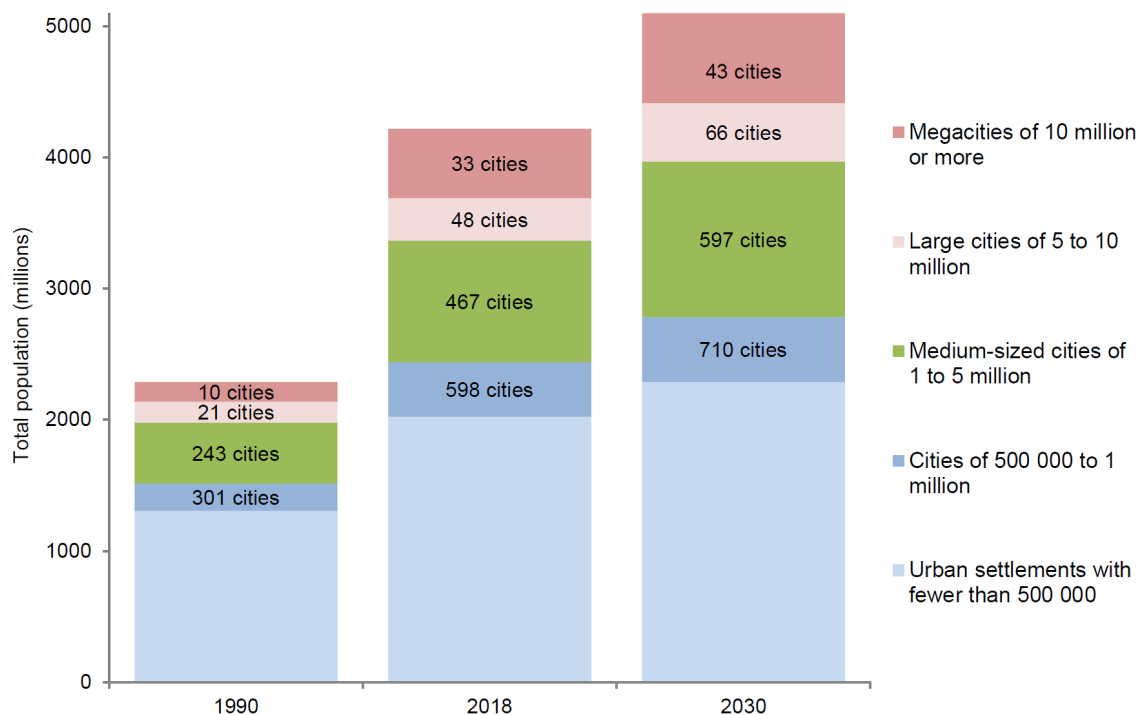


Figure 2: Population and number of cities of the world, by size class of urban settlement, 1990, 2018 and 2030. Source: World Urbanization Prospects, 2019

This trend has a profound impact on housing markets, driving up demand for residential properties and contributing to rising property values in urban centers.

According to Xu & Dong (Xu & Dong, 2024), this process is primarily driven by the pursuit of better job opportunities, access to essential services, and an enhanced quality of life. Alongside the demand for housing, this shift also stimulates the need for commercial spaces, further transforming the urban landscape. This growth has also encouraged infrastructure development, improving transportation networks and public services, with positive effects on property values. In fact, with the growth of cities we are also seeing rising housing prices in neighboring areas, and this is producing large areas of commuting and creating strong commuting between larger cities and those small and medium-sized cities with a high degree of accessibility to metropolitan centers (ANCE, 2025).

However, while urban expansion brings economic opportunities, it also presents substantial challenges. Increased demand for housing has led to soaring property prices, exacerbating affordability problems and deepening social inequalities. Increasing pressure on resources and public services further complicates urban planning and sustainable development efforts.

Looking ahead, urbanization is expected to continue at a rapid pace, presenting both challenges and opportunities. To address the pressures of rising demand and affordability crises, policymakers and industry leaders must explore innovative solutions for sustainable, inclusive, and affordable housing, ensuring that urban growth remains both equitable and resilient (Xu & Dong, 2024).

Looking at the Italian context, according to ANCE's annual report "Osservatorio congiunturale sull'industria delle costruzioni" (ANCE, 2025), in 2023, 57.8% of Italian municipalities lost population, and this decrease mainly affected municipalities with up to 5,000 inhabitants, which lost 24,500 residents, while municipalities above 100,000 inhabitants recorded a slight increase overall. This phenomenon has been going on for several years now and has produced a population decline that is

much more evident precisely in the peripheral and ultra-peripheral areas that are significantly distant from the centers of supply of essential services (of education, health, and mobility), in which population aging and depopulation is manifested more strongly than in other areas.

The ANCE's report also estimates the share of municipalities in population decline at 69.9% within 10 years and 74.5% within 20. In addition, the population change, in the short (2023-2033) and medium term (2023-2043), is more pronounced in the municipalities of the Inland Areas (-3.8% and -8.7%, respectively), compared to the municipalities of the Centers (-0.7% and -3.0%, respectively), i.e., municipalities equipped, on the other hand, with infrastructure that guarantees essential services on the three sides of health, education and mobility. It should also be emphasized that the phenomenon does not have a homogeneous intensity, but is more pronounced among the Inner Areas of the South, which will see more than 90% of municipalities lose population in only 10 years (in those of the North Central the share will be around 70%) (ANCE, 2025).

For these reasons, also in the Italian context, urban policies become essential for building inclusive cities and reorganizing neighborhoods with a diverse range of housing types, ensuring their affordability. Moreover, it is also relevant to say that urbanization does not simply increase pressure on major urban areas, but also deepens the gap between central and marginal territories. This process reshapes housing preferences, concentrates demand in better-connected and service-rich locations, and makes the organization of everyday residential life more complex in dense and highly interdependent settings. For this reason, urbanization should be understood not only as a spatial trend, but also as a factor that redefines the conditions under which housing is accessed, inhabited, and managed.

2.1.2 Demographic Shifts

Another fundamental factor shaping the real estate market is the global population's demographic change. Shifts in demographic structures - such as aging demographics, domestic and international migration, and evolving family compositions - are profoundly influencing housing supply and demand patterns.

This phenomenon is particularly pronounced in Italy, where these demographic dynamics are strongly evident, although their impact extends across other European nations as well. According to ISTAT, as of January 1, 2024, Italy's resident population numbered 58,989,749 individuals. Compared to the same date in the previous year, there is a decrease of about 7 thousand residents, showing at least a slowdown in the population decline compared to the previous two years. Notably, this demographic contraction is entirely attributable to the native Italian population, whereas overall population growth over the past two decades has been sustained solely by an increase in the foreign-born segment (ISTAT, 2025).

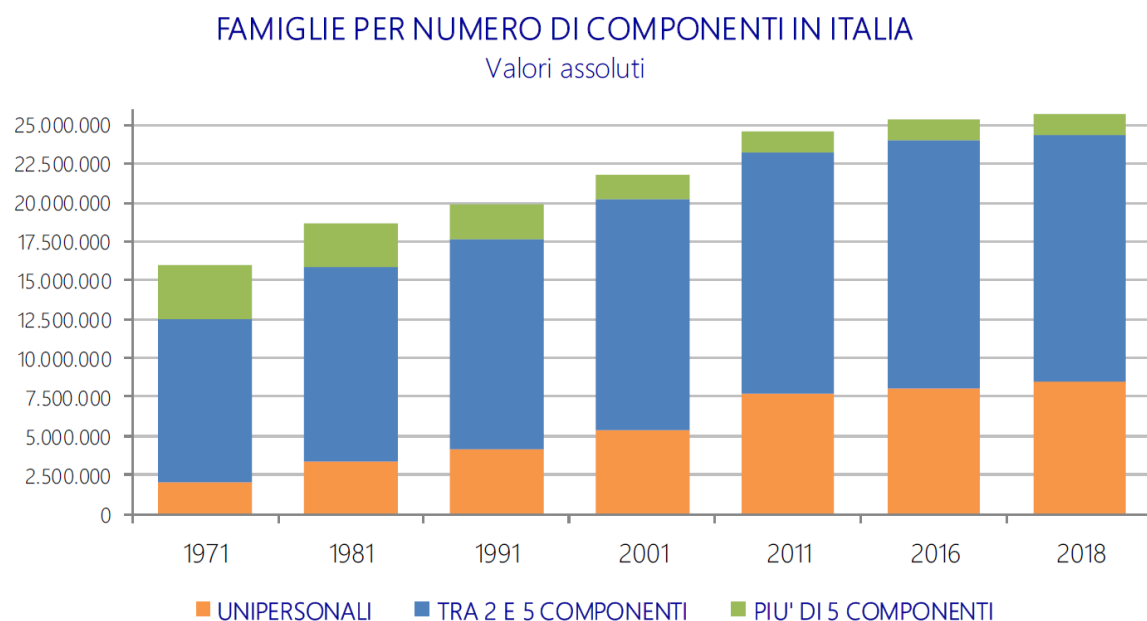
Over the years, the continuous increase in life expectancy and persistent low fertility rates have made Italy one of the oldest countries in the world. Currently, 24.3% of Italy's population is aged 65 or older, and ISTAT projections indicate that by 2050, more than one in three Italians (34.5%) will be at least 65 years old. Furthermore, according to a scenario developed by the OECD (Organization for Economic Co-operation and Development) by mid-century, the number of retirees in Italy will surpass that of active workers, increasing the dependency ratio from the current 68.6% to an unprecedented 105.7%, the highest in Europe (ANCE, 2020).

Without timely policy interventions, population aging could be a significant obstacle to economic growth. According to the Bank of Italy, Eurostat's projected decline in the working-age population, assuming all other economic variables remain constant (such as labor productivity, workforce participation rates, and unemployment levels), could lead to a reduction in annual per capita GDP growth of approximately 0.5 percentage points over the next 30 years. This scenario would inevitably

strain public resources, particularly those allocated to welfare programs, which are expected to rise in response to the increasing proportion of elderly citizens (ANCE, 2020).

In parallel, this increasing longevity, accompanied by declining birth rates, is having direct and tangible repercussions on the housing market. Traditional large-family dwellings are becoming increasingly mismatched with the evolving needs of an aging population which often prefers to live in smaller spaces with easy access and in close proximity to essential services such as health facilities, retail centers, and public transportation. Consequently, demand for senior housing and compact urban apartments in central or well-connected areas is rising while demand for large suburban homes declines (Buildbull, 2025).

Another significant transformation in demographic patterns is the evolution of household structures. Large families, once predominant, are now in decline, replaced by smaller households, often consisting of single people or childless couples. ISTAT data on household composition reveals a steady simplification in family size and structure. Between 1997 and 2018, the average household size in Italy decreased from 2.7 to 2.3 members. This shift is primarily attributed to the surge in single-person households, which have increased by over 10 percentage points over the past two decades, rising from 21.5% in 1997-98 to 33.0% in 2017-18, now accounting for one-third of all households. At the same time, large families, which amounted to 7.7 percent in 1997-98 and now reach just 5.3 percent, have decreased over the same period (ANCE, 2020). From the following chart, it is possible to understand this trend and how it has evolved over the years (*Figure 3*).



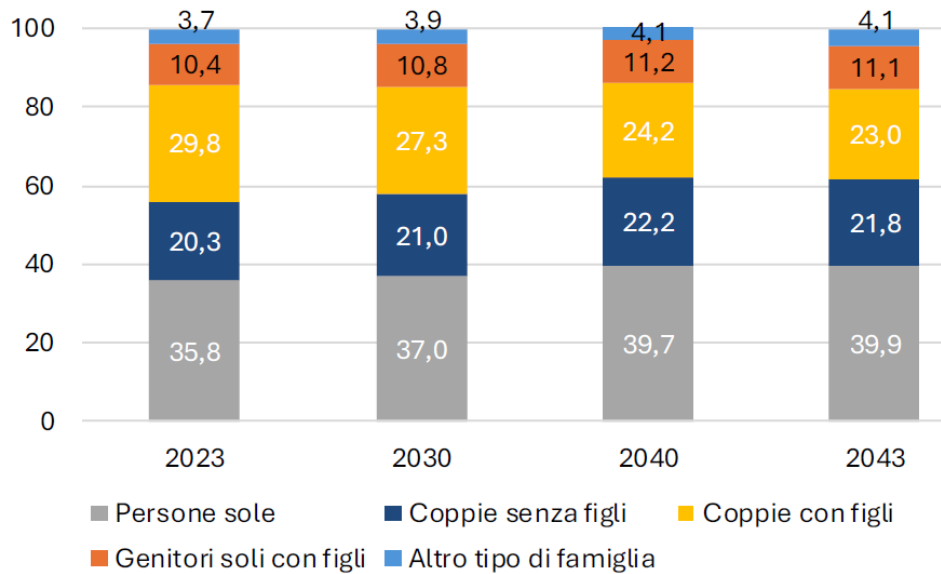
Elaborazione Ance su dati Istat

Figure 3: Families by number of members in Italy from 1971 to 2018 (absolute values). Source: ANCE, 2020

Projections indicate that nearly 40% of households in 2043 will consist of a single person (*Figure 4*), or 10.7 million people, and of these 6.2 million will be 65 and older, and the decline in couples with children will continue (ANCE, 2025).

FAMIGLIE RESIDENTI IN ITALIA PER TIPOLOGIA

Previsioni scenario mediano - Valori %



Elaborazione Ance su dati Istat

Figure 4: Families resident in Italy by type - Median Scenario Forecast - % Values. Source: ANCE, 2025

Among household categories, those registering the largest increase are the families without a nucleus, that is, those in which members do not form any couple or parent-child relationships, and almost all of which are made up of people living alone. This phenomenon has significantly influenced real estate trends, driving increased demand for studio apartments, one-bedroom units, and compact living spaces rather than more spacious housing. Additionally, the increase in single-person households and dual-income, childless couples has encouraged the development of housing solutions in urbanized and well-connected areas, where convenience, proximity to the workplace and lifestyle amenities are prioritized. This has also reinforced the preference for renting over homeownership (Buildbull, 2025).

Another relevant “family” phenomenon is the increasingly delayed departure of young adults from their parental homes. Economic instability, challenges in securing stable employment, and the high cost of housing are key factors preventing young people from attaining full financial independence. In Italy, more than half of individuals aged 20 to 34, approximately 5.5 million young adults, still live with at least one parent, a proportion significantly higher than in many other European countries (ANCE, 2020).

On the other hand, an internal migration is reshaping Italy’s urban landscape, with young people increasingly moving to metropolitan centers for employment or educational opportunities. This migration pattern has given rise to two distinct phenomena. First, a growing segment of young professionals is adopting a more dynamic lifestyle, characterized by frequent job relocations and a demand for flexible housing solutions. This has led to an interest in “home as a service” concepts, where shared spaces blur the lines between living, working, and leisure. Co-living arrangements, designed to accommodate these evolving preferences for the younger population, have emerged as a new asset class attracting investor interest in Italy (ANCE, 2020).

Second, urban development initiatives in underdeveloped areas, coupled with the growing prevalence of remote work, are further changing housing preferences. Suburban and lower-density areas with modern infrastructure and high-quality amenities are becoming increasingly attractive to young workers, primarily due to their more affordable real estate offerings (Brown, 2018).

Additionally, the growing mobility of students, both within Italy and from abroad, has intensified the demand for student housing. While this segment is already well-established in other European markets, Italy still holds significant growth potential in this area (ANCE, 2020).

The interplay between demographic shifts and real estate market dynamics presents both challenges and opportunities for developers and investors. Adapting housing supply to the needs of an aging population will necessitate increased investment in senior-friendly infrastructure and accessibility-focused design. Simultaneously, policies aimed at addressing internal and external migration will be crucial in fostering diverse and sustainable living environments to accommodate the growing demand in key urban areas. Finally, evolving family structures will require a fundamental rethinking of residential typologies, promoting the creation of versatile, functional, and dynamic housing solutions that align with contemporary living patterns (Buildbull, 2025).

In conclusion, demographic shifts are therefore relevant not only because they alter the composition of demand, but because they are interconnected with the condition of the existing stock, which often remains physically and functionally misaligned with ageing, smaller, and more fragmented households. Moreover, they obviously affect housing demand, by increasing the need for accessible and more differentiated housing solutions and they have management implications in multi-actor settings, where greater heterogeneity of residents, needs, and life situations tend to intensify coordination, service, and governance challenges within shared residential environments.

2.1.3 Geopolitical and Economic Backdrop

Nowadays, the global real estate and construction sectors are navigating a complex landscape marked by persistent geopolitical tensions and economic uncertainties. The aftermath of the COVID-19 pandemic, coupled with ongoing conflicts and trade disputes, has led to heightened volatility in global markets. According to PwC's *Emerging Trends in Real Estate®: Global Outlook 2025* (PwC & Urban Land Institute, 2024a), political decisions and geopolitical instability are among the main drivers of inflation, influencing investment strategies and capital flows in the real estate sector.

Despite these challenges, some asset classes, such as data centers, new energy infrastructure, and logistics facilities, have shown good resilience due to accelerating digital transformation, energy requirements, and e-commerce growth. However, investors are increasingly focusing on sectors that offer stable income streams and are in line with long-term structural trends. For this reason, there is a much broader consensus on residential as a strong sector, and demographically driven sub-sectors such as senior and student housing are expected to remain popular for transactions in 2025, as is well represented in *Figure 5*.

Rank	United States and Canada	Europe	Asia Pacific
1	Data centres	Data centres	Data centres
2	Single-family housing	New energy infrastructure	Health/wellness
3	Senior housing	Student housing	Industrial/distribution
4	Multi-family housing	Logistics facilities	Senior housing
5	Neighborhood and community shopping centers	Private rented residential	Multifamily/rented residential
6	Manufacturing	Self-storage facilities	Student housing
7	Student housing	Retirement/assisted living	Hotels
8	Warehouse	Co-living	Life sciences
9	Flex	Education-related real estate	Affordable housing
10	Fulfillment	Serviced apartments	Self-storage

Source: *Emerging Trends in Real Estate Asia Pacific, Europe, United States and Canada 2025 surveys*

Figure 5: Overall sector prospects for 2025. Source: PwC & Urban Land Institute, 2024

In Europe, the real estate and construction sectors are contending with a cautiously optimistic outlook. The *Emerging Trends in Real Estate®: Europe 2025* report (PwC & Urban Land Institute, 2024a) highlights that while there is a focus on sustainability and operational real estate, concerns persist regarding geopolitical and economic instability, regulation, and construction costs. The stabilization of interest rates and valuations has provided greater predictability, with 80% of European real estate leaders expecting business confidence and profits to stay the same or rise in 2025 (Figure 6). However, increased regulation and construction costs remain significant concerns.

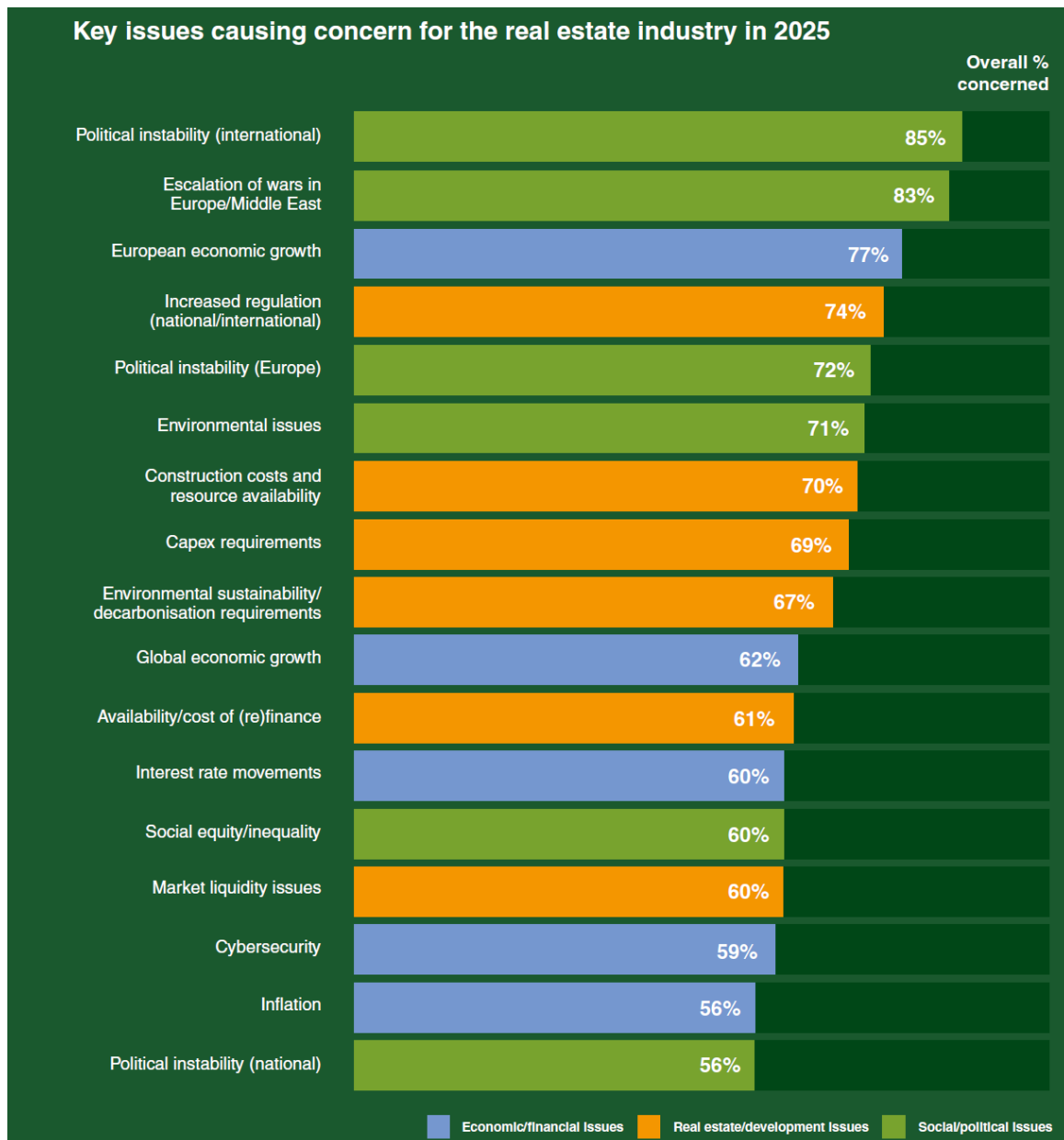


Figure 6: Key Issues causing concern for the real estate industry in 2025. Source: PwC & Urban Land Institute, 2024

In all its segments, European residential housing has been one of the most consistently highly rated real estate sectors over the past decade, particularly due to its perceived stability amid macroeconomic uncertainties. The various residential sub-sectors, such as multifamily, single family, affordable, student, and senior housing (Figure 7), occupy five of the top 10 spots in the sector rankings, and seven of the top 15 and are favored for their resilience and demographic-driven demand (PwC & Urban Land Institute, 2024a). Student housing benefits from strong international mobility and undersupply in key cities, while senior living as well as retirement/assisted living address the needs of an aging population. Meanwhile, social and affordable housing are supported by policy incentives and public-private partnerships. In addition, co-living is expanding in urban hubs, targeting young professionals seeking affordability and community. Moreover, the private rented residential (PRS) market, including build-to-rent schemes, is evolving into a mature institutional asset class. Rising interest rates and ownership costs have redirected demand toward rental housing, especially in high-cost urban areas. Institutional investors are increasingly focused on ESG-compliant assets and tenant experience, reinforcing the strategic shift from asset ownership to service provision. These trends collectively shape a diversified and impact-driven residential investment landscape in Europe.

Figure 3-2 Sector prospects in 2025

Generally good = above 3.5 Fair = 2.5 to 3.5 Generally poor = under 2.5

Overall prospects			Investment			Development			Overall Income		
Rank	Sector	Score	Rank	Sector	Score	Rank	Sector	Score	Rank	Sector	Score
1.	Data centres	4.63	1.	Data centres	4.66	1.	Data centres	4.60	1.	Data centres	4.52
2.	New energy infrastructure*	4.55	2.	New energy infrastructure*	4.56	2.	New energy infrastructure*	4.52	2.	New energy infrastructure*	4.31
3.	Student housing	4.23	3.	Student housing	4.27	3.	Student housing	4.20	3.	Student housing	4.13
4.	Logistics facilities	4.09	4.	Logistics facilities	4.16	4.	Retirement/assisted living	4.01	4.	Private rented residential	4.03
5.	Private rented residential	4.06	5.	Other storage facilities	4.13	5.	Private rented residential	4.01	5.	Logistics facilities	3.99
6.	Self-storage facilities	4.05	6.	Private rented residential	4.12	6.	Logistics facilities	4.00	6.	Co-living	3.98
7.	Retirement/assisted living	4.04	7.	Self-storage facilities	4.11	7.	Self-storage facilities	3.97	7.	Serviced apartments	3.96
8.	Co-living	4.01	8.	Education-related real estate	4.08	8.	Affordable housing	3.96	8.	Self-storage facilities	3.95
9.	Education-related real estate	4.01	9.	Industrial/warehouse	4.08	9.	Healthcare	3.96	9.	Healthcare	3.87
10.	Serviced apartments	4.00	10.	Serviced apartments	4.08	10.	Education-related real estate	3.94	10.	Hotels	3.87
11.	Affordable housing	3.99	11.	Co-living	4.08	11.	Co-living	3.93	11.	Industrial/warehouse	3.85
12.	Healthcare	3.99	12.	Retirement/assisted living	4.07	12.	Serviced apartments	3.92	12.	Other storage facilities	3.84
13.	Industrial/warehouse	3.99	13.	Healthcare	4.02	13.	Social housing	3.92	13.	Affordable housing	3.82
14.	Other storage facilities	3.97	14.	Affordable housing	4.01	14.	Industrial/warehouse	3.88	14.	Education-related real estate	3.82
15.	Social housing	3.96	15.	Life sciences	4.00	15.	Life sciences	3.82	15.	Life sciences	3.82
16.	Life sciences	3.90	16.	Hotels	4.00	16.	Other storage facilities	3.77	16.	Retirement/assisted living	3.81
17.	Hotels	3.85	17.	Social housing	3.99	17.	Hotels	3.70	17.	Leisure	3.74
18.	Leisure	3.74	18.	Leisure	3.81	18.	Leisure	3.67	18.	Housebuilding for sale	3.64
19.	Housebuilding for sale	3.69	19.	Housebuilding for sale	3.71	19.	Housebuilding for sale	3.66	19.	Social housing	3.61
20.	Retail parks	3.44	20.	Retail parks	3.70	20.	Parking	3.33	20.	Retail parks	3.59
21.	Parking	3.40	21.	Parking	3.46	21.	Retail parks	3.15	21.	Parking	3.44
22.	Flexible/serviced offices	3.24	22.	Flexible/serviced offices	3.38	22.	Flexible/serviced offices	3.10	22.	Central city offices	3.37
23.	Central city offices	3.22	23.	Central city offices	3.36	23.	Central city offices	3.09	23.	Flexible/serviced offices	3.23
24.	High street shops	3.05	24.	High street shops	3.23	24.	High street shops	2.88	24.	High street shops	3.14
25.	City centre shopping centres	2.87	25.	City centre shopping centres	3.18	25.	Business parks	2.61	25.	City centre shopping centres	3.11
26.	Out-of-town retail destinations	2.78	26.	Out-of-town shopping centres	3.07	26.	City centre shopping centres	2.55	26.	Out-of-town shopping centres	2.96
27.	Business parks	2.75	27.	Business parks	2.90	27.	Out-of-town shopping centres	2.49	27.	Business parks	2.82
28.	Suburban offices	2.10	28.	Suburban offices	2.16	28.	Suburban offices	2.03	28.	Suburban offices	2.23

* e.g. solar, wind, energy storage, electric transportation

Source: Emerging Trends Europe survey, 2025

Figure 7: Sector prospects in 2025. Source: PwC & Urban Land Institute, 2024

Italy's real estate sector reflects broader European trends, although the outlook for 2025 is framed against a backdrop of modest economic growth in Italy. According to the latest data from the Bank of Italy (Banca D'Italia, 2025a), GDP growth is projected at 0.6% for 2025, a downward revision from earlier estimates. Moreover, inflation is expected to stabilize around 1.5% in both 2025 and 2026.

Recent data allow to compare these projections with the actual performance of the Italian economy in 2025. According to the latest estimates, Italian GDP expanded by around 0.5-0.7 per cent in real terms in 2025. Over the same year, the average annual inflation rate stood at 1.7 per cent, up from 1.0 per cent in 2024, and it is predicted to decline to 1.5 per cent in 2026, confirming the expected stabilization of price dynamics after the more acute phases of the post-pandemic and energy-related shocks (Banca D'Italia, 2025b).

According to the study conducted by ANCE (2025), despite ongoing geopolitical instability, primarily due to conflicts in Ukraine and the Middle East some positive factors are emerging. The European Central Bank's loosening of monetary policy and a significant easing of inflation are expected to positively influence the markets, particularly in Italy.

In this environment, investment trends in the construction sector remain critical. Between 2021 and 2023, construction was a major driver of Italy's economic growth, contributing to a 14.8% increase in GDP, outperforming Germany (4.8%) and France (10.7%), and exceeding pre-pandemic levels.

This strong performance was fueled mainly by two factors: tax incentives for building renovations and the National Recovery and Resilience Plan (PNRR), set to conclude by 2026. Tax bonuses, particularly those linked to energy efficiency upgrades, initiated a significant wave of property retrofits, moving from single-unit interventions to whole-building approaches, necessary to maximize the goals of containing energy consumption and reducing greenhouse gas emissions into the atmosphere. By 2023, approximately 500,000 renovation projects (representing 5.8% of Italy's building stock) had been carried out, peaking with €44 billion in investments.

Looking ahead, ANCE (2025) estimates a further 7% annual decline in construction output for 2025, worsened by a sharp -30% drop in residential renovation works, largely due to reductions in fiscal incentives. Non-residential private renovations are also expected to fall by 2.5% for the same reasons. New residential construction is forecasted to decrease by 2.6%, reflecting a contraction in building permits, whereas private non-residential construction is projected to grow by 3.2%, sustained by positive trends in building authorizations despite lingering economic uncertainties.

The actual evolution of the construction sector in 2025, as described in the latest ANCE Conjunctural Observatory (ANCE, 2026), only partially confirmed these projections. The report highlights a slight overall decline in construction investments, mainly driven by the slowdown in residential building activities, while public works financed through the National Recovery and Resilience Plan (PNRR) played a crucial role in sustaining the sector. In other words, the 2025 outturn points to a still fragile but relatively resilient construction industry, with the contraction in private residential renovation and new housing partly offset by the expansion of public infrastructure projects, which remain central to the medium-term outlook up to 2026.

On the real estate investment side, research by Dils (2025) indicates a cautiously optimistic sentiment at the start of 2025 in the national landscape. Investment volumes reached €2.7 billion in Q1 2025, up 44% year-over-year. Over the past 12 months, total investments rose to €10.8 billion, a 45% increase.

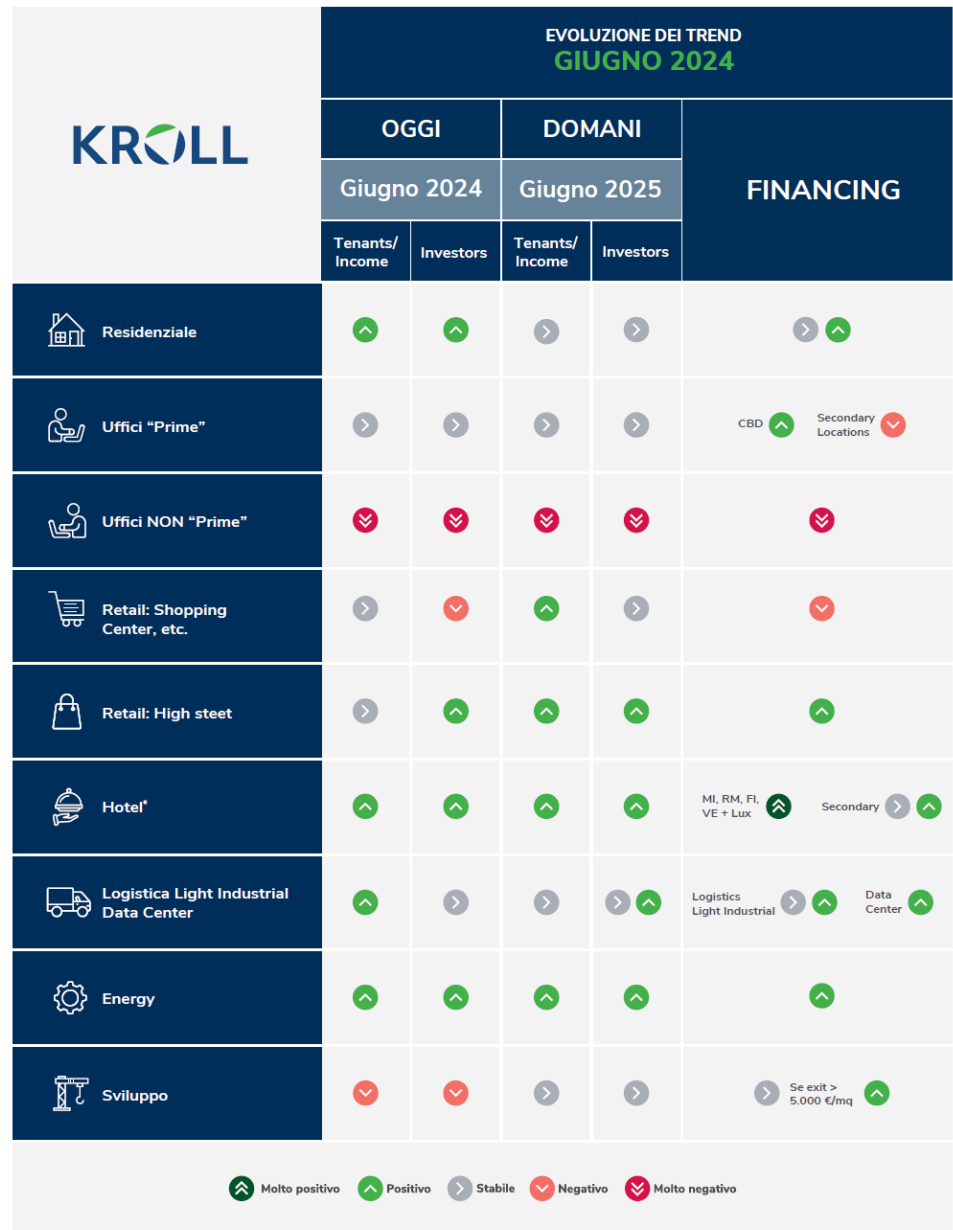
Subsequent data confirm that this cautiously optimistic phase turned into a broader rebound over the full year. According to Dils' latest market review, total real estate investments in Italy reached approximately €12.4-12.6 billion in 2025, the highest level in the past six years and close to an all-time high, marking a year-on-year increase of around 20–23 per cent compared with 2024.

Among the asset classes, Data Centers, Healthcare, and Hospitality are identified as particularly dynamic sectors. Hospitality is attracting strong foreign capital interest, with growing attention to non-traditional formats like Apart-hotels and short-term rental residences. Meanwhile, Healthcare, though still niche with only 5% of total investments, is gaining traction among institutional investors due to its robust fundamentals. Data Centers, in particular, are experiencing unprecedented growth. This overview is also shared by KROLL (2024) (*Figure 8*), which also points out that the Living sector, fueled by demand for student housing and residential redevelopment, showed encouraging signs.

Regarding the residential market, both Dils (2025) and Kroll (2024) report a positive trend, with a slight increase in transaction volumes in 2024. Milan and Rome, although the dynamics differed between new construction and types of units sold, ended the year with positive sentiment, reinforced in part by growing interest in newly built housing (Dils, 2025). At the same time, there are major redevelopment efforts in cities such as Bologna, Genoa and Turin, which are considered as secondary cities with ambitious urban transformation projects (KROLL, 2024).

Subsequent evidence confirms that this positive trend continued into 2025. In its latest market review, Dils highlights that the Living sector recorded a further increase in investment volumes, with approximately €1 billion invested in 2025 (+75 per cent compared with 2024), and that residential transactions in major cities. The overall performance of the sector has been driven in particular by

student housing, which doubled its annual investment volume, with more than half of the value attributable to core transactions, further reinforcing the strategic relevance of the Living segment within the Italian residential market (Dils, 2026).



*In particolare i target 4Stelle, 4Stelle Superior e 5Stelle Lusso

Figure 8: Evolution of the real estate sectors per investments: June 2024 – June 2025. Source: KROLL, 2024

In conclusion, geopolitical and economic instability therefore matters not only because it affects market sentiment because it directly influences access to credit, construction and renovation costs, the timing of interventions, and the feasibility of upgrading the existing stock. This is particularly relevant in the Italian residential context which is characterized by fragmented ownership and an ageing built environment, where investment decisions are often discontinuous and highly sensitive to fiscal incentives and macroeconomic uncertainty. In this sense, the geopolitical and economic backdrop affects the housing demand, by conditioning affordability and households’ purchasing capacity and has also management implications in multi-actor settings, where collective decisions on shared buildings become more difficult under conditions of financial pressure, regulatory change, and uncertainty.

2.1.4 Sustainable Development

Another crucial exogenous factor that is reshaping the real estate sector is related to sustainable development promoted at world and European levels, in accordance with the need to contain the disruptive effects of climate change, global warming, primary resources pressure, and pollution. These policies and regulations aim to minimize the environmental impacts generated and the consumption of water, energy, and raw materials, improving resource efficiency, and reducing CO₂ emissions.

The United Nations (UN) has spearheaded this mission, particularly through the 2030 Agenda for Sustainable Development, an action program signed in September 2015 by the governments of the 193 UN member countries (United Nations, 2015). The Agenda aims to achieve economic, social, and environmental sustainability and to improve quality of life. It proposes 17 Sustainable Development Goals (SDGs), along with 169 targets (*Figure 9*), with the aim to establish clear objectives necessary to achieve a sustainable future for the world's population (United Nations Economic Commission for Europe, 2021).



Figure 9: 17 Sustainable Development Goals . Source: United Nations Economic Commission for Europe, 2021

In response, the European Union (EU) has aligned its policies with these goals, implementing concrete measures and incentives to drive sustainability. To achieve the transition to a low-carbon economy, the European Commission has already published, in 2011, the “Roadmap for moving to a competitive low-carbon economy in 2050” (European Commission, 2011a), which defined the main objectives, including the reduction of greenhouse gas (GHG) emissions by 80% in 2050 (considering 1990 emission levels), increasing the share of renewable energy and promoting global energy efficiency (*Figure 10*).

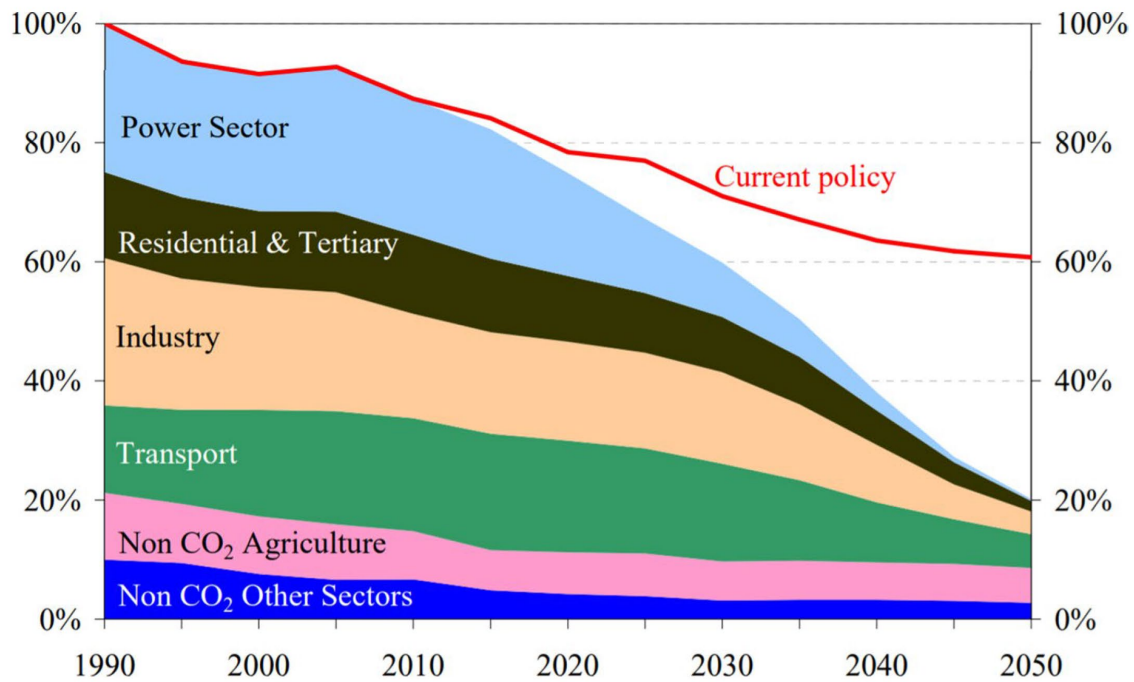


Figure 10: Pathway towards an 80% emission reduction by 2050. Source: European Commission, 2011a

One of the sectoral perspectives was dedicated to the built environment since it provides short-term and low-cost opportunities to reduce GHG, mainly by improving buildings' energy performance, especially for the new buildings for which the main goal established was the design of NZEB ("nearly zero-energy buildings"), defined as buildings with very high energy performance where the nearly zero or very low amount of energy required is covered to a significant extent by energy from renewable sources, as specified in Directive 2010/31/EU). Moreover, this document also stressed the importance of shifting energy sources in building usage towards renewable energy, such as solar heating or biomass, and low-carbon electricity, using storage heaters or heat pumps.

The publication of Directive (EU) 2018/844 of the European Parliament and of the Council (European Parliament, 2018), which amended Directive 2010/31/EU on the energy performance of buildings and Directive 2012/27/EU on energy efficiency, was a key step towards this goal. The Directive establishes the obligation for all Member States to develop a plan for their building stock, outlining specific objectives to be achieved in the short term (2030), medium term (2040), and long term (2050) (European Parliament, 2018). Notwithstanding these adaptations, and in line with the "Roadmap for moving to a competitive low-carbon economy in 2050", it is established that all Member States should: (1) as regards new buildings, and in line with previous recommendations (European Commission, 2016), certify that all new constructions are NZEB by 2020; (2) as regards existing buildings, safeguard the need to develop a "long-term renovation strategy to support the renovation of the national stock of residential and non-residential buildings, both public and private, into highly energy-efficient and decarbonized building stock by 2050", facilitating their transformation into NZEB; (3) as regards historic buildings and sites, promote testing and research for new solutions to improve their energy performance while safeguarding cultural heritage.

In this framework, the impact of buildings and, consequently, of the construction and real estate sector on sustainable development has been recognized. According to the Bringing Embodied Carbon Upfront report (World Green Building Council, 2019), the building sector is responsible for 39% of global CO₂ emissions and around 40% of global energy consumption: 11% comes from materials and construction processes, while 28% from the operation of buildings. In the next decade, this consumption is forecasted to reach 53%, with a likely associated increase in emissions, driven by the projected

population increase. Consequently, the building sector must decarbonize by reducing energy intensity by at least 80% by 2030 and be climate-neutral by 2050 (Immobili inquinanti e datati, Polimi, 2023).

In the area of retrofitting existing buildings, more needs to be done to increase energy savings, especially considering the fact that there are about 220 million buildings in Europe, 85% of which were built before 2000 and about 75% of which are energy inefficient by current standards. In addition, the number of existing buildings that have undergone renovation or retrofitting is relatively small. As for Italy, 55 % of buildings were built more than 50 years ago, and 28% of all residential dwellings display the lowest energy efficiency level (Forni et al., 2025).

The “Energy 2020. Strategy for competitive, sustainable and secure energy”, the “Roadmap for moving to a competitive low-carbon economy in 2050”, and the “Energy Roadmap 2050” therefore emphasize the need for more action in the field of buildings, especially favoring renovation processes and infrastructure maintenance, which represents an important share of total construction employment and production (European Commission, 2010, 2011a, 2011b).

In this context, the European Union has recently reinforced its legislative framework with the European Green Deal (European Commission, 2019) that sets two main objectives: the overarching goal of making Europe the first climate-neutral continent by 2050 and the reduction of greenhouse gas emissions by 2030 (Figure 11). Under the first target, all member states will have to have zeroed out their emissions and offset the remaining and unavoidable ones by the year 2050. The second, on the other hand, named “FIT for 55”, requires member states to reduce greenhouse gas emissions by at least 55% by 2030 compared to those recorded in 1990, an intermediate step to the carbon neutrality horizon of 2050 (Scoppa, 2023). This framework provides both a political vision and a financial roadmap, encouraging investments in green infrastructure, building renovation, and circular construction.

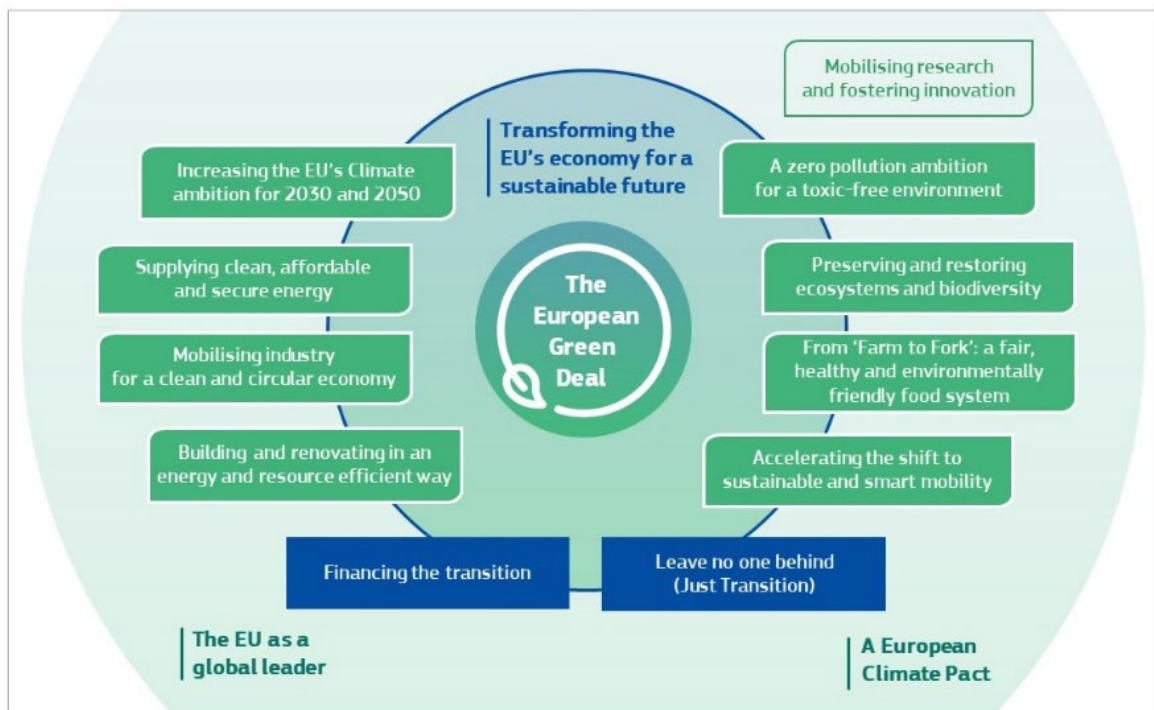


Figure 11: Key points of the European Green Deal. Source: European Commission, 2019b

It also turned out to be the strategic basis from which all subsequent specific initiatives, in particular the Renovation Wave Strategy (European Commission, 2020) and the Energy Performance of Buildings Directive (EPBD) (European Parliament & Council of the European Union, 2024).

The Renovation Wave Strategy, which implements the Green Deal in the construction sector, aims to at least double the annual renovation rate of buildings by 2030, with the goal of improving energy performance and reducing energy poverty, especially in residential and public buildings that have the worst performance in terms of emissions. The strategy estimates that 35 million buildings could be renovated by 2030, creating up to 160,000 additional green jobs in the construction sector (European Commission, 2020). It also promotes the digitalization and industrialization of construction processes to increase efficiency.

With the goal of translating the Renovation Wave into legislative obligations, the recently revised Energy Performance of Buildings Directive (EPBD) – Directive (EU) 2024/1275 which sets out a clear plan of action punctuated in time stages. It strengthens minimum energy performance requirements for both new and existing buildings, private and public. One of its key innovations is the introduction of Zero Emission Buildings (ZEB) as the new standard for new constructions from 2030 onward, and from 2028 for public buildings. Regarding existing buildings, the minimum energy performance standards shall ensure, at least, that all non-residential buildings are below the 16% threshold (expressed by a numeric indicator of primary or final energy use in kWh/(m².y)) from 2030 and the 26% threshold from 2033. Whereas for residential buildings, the average primary energy consumption in kWh/m² per year of the entire residential building stock must: a) decrease by at least 16% by 2030; b) decrease by at least 20-22% by 2035; c) by 2040, and every 5 years thereafter, be equivalent to or less than the nationally determined value resulting from a progressive decrease in average primary energy consumption from 2030 to 2050 in line with the transformation of the residential building stock into a zero-emission building stock. However, each Member State is subject to one constraint: at least 55% of the reductions must be achieved through the renovation of the worst-performing buildings. The directive also reinforces the role of Energy Performance Certificates (EPCs), which attribute an energy efficiency label to buildings on a scale from G (the least efficient) to A4 (the most efficient) (Figure 12) based on buildings' overall energy consumption, digital building logbooks, which and national renovation plans to enhance transparency and data availability (European Parliament & Council of the European Union, 2024).

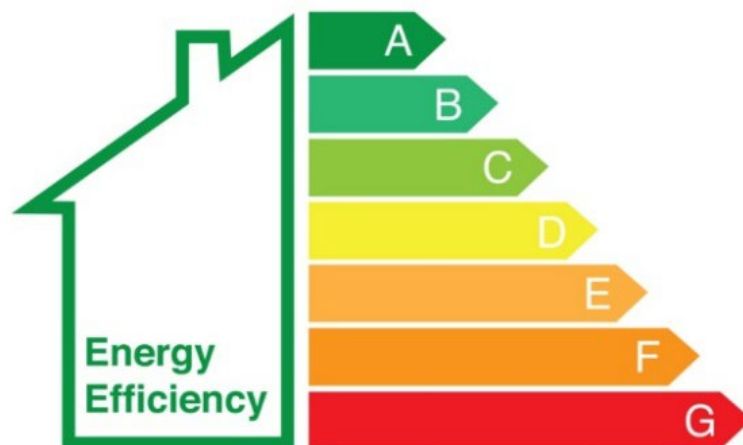


Figure 12: Energy Efficiency Labels for Energy Performance Certificates. Source: Webmaster, 2021

Furthermore, the directive emphasizes a people-centered and inclusive approach by introducing measures to tackle energy poverty and ensure a fair transition. It supports vulnerable households by promoting accessible financing mechanisms and technical assistance for deep renovations. The updated EPBD also fosters the decarbonization of heating and cooling systems, supporting the gradual phase-out of fossil fuel boilers by 2040 and encouraging the adoption of energy-efficient alternatives such as heat pumps and district heating based on renewables. It also mandates the deployment of electric vehicle (EV) charging infrastructure and smart technologies to promote digitalization, energy management, and active user engagement.

Moreover, in addition to the Energy Performance of Buildings Directive (EPBD), two other key pieces of legislation are the Energy Efficiency Directive (EED – Directive (EU) 2023/1791) and the Renewable Energy Directive (RED – Directive (EU) 2018/2001, as amended by Directive (EU) 2023/2413) (Luca Papapietro, 2024). The revised EED strengthens the EU energy efficiency target, making it binding for Member States to collectively ensure an additional 11.7% reduction in final energy consumption by 2030 compared with 2020 projections and embedding the “energy efficiency first” principle in policy-making and investment decisions, with specific obligations for the renovation of public buildings and the reduction of energy use in the public sector (European Commission, 2023a). The updated RED III, in turn, increases the overall renewables target and introduces an indicative benchmark of at least 49% renewable energy in buildings by 2030, reinforcing the role of renewable-based and low-carbon heating and cooling and supporting the decarbonization of the building stock in coherence with EPBD requirements (European Commission, 2023b).

Together, these legislative instruments are reshaping the built environment in the EU, accelerating the transition toward sustainable, resilient, and decarbonized buildings. They also create new challenges and opportunities for stakeholders, including property owners, investors, designers, and construction firms. These dynamics are particularly relevant in Italy, where the building stock is both extensive and ageing and it remains only partially aligned with current energy and environmental European standards. This condition makes renovation, retrofit, and performance upgrading not only a technical challenge, but also an organizational and financial one, especially where intervention depends on coordination among multiple actors and fragmented ownership structures, as is the case of the residential sector. The structural characteristics and energy-performance profile of the Italian residential stock are examined in greater detail in Section “2.2.1.3 Building Age and Energy Performance”.

2.1.5 Technological and Digital Advances

Digitalization and technological innovation are playing an increasingly critical role in transforming the real estate and construction sectors. These changes are not only modernizing internal processes but also reshaping the structure and dynamics of the entire industry.

Digitalization can be defined as a socio-technical innovation process that involves generating, developing, and implementing new ideas based on digital technologies. It encompasses both technological and organizational dimensions, highlighting the need for aligned strategies to successfully integrate innovation within companies (Vigren et al., 2022). It enables improvements in efficiency, transparency, and decision-making and, for these reasons, it is now widely recognized as a key driver of economic growth and productivity across sectors (Vigren et al., 2022).

However, the level of digital transformation varies not only across sectors and industries, but also across countries, and is therefore not a homogeneous phenomenon (Tagliaro et al., 2024). In the real estate and construction sectors, digitization involves a wide range of companies and other actors who together create an ecosystem that fosters collaboration among actors and the transfer of digital knowledge and skills.

In the real estate and construction sector, digitalization involves a wide range of companies and other actors who together create an ecosystem that fosters collaboration among actors and the transfer of digital knowledge and skills. Moreover, beyond process and organizational innovation, it is also being explicitly embedded into the regulatory framework for the built environment. The recast Energy Performance of Buildings Directive (EPBD) introduces, among others, the Smart Readiness Indicator (SRI), a common EU framework for assessing and rating the capability of buildings to adapt their operation to occupants’ needs, to maintain efficient building–system performance over time and to

enable active interaction with the energy grid (European Commission, 2024). In this context, “smart readiness” refers to the building’s ability to adjust its functioning in response to users’ requirements, to support efficient operation of the building–plant system, and to participate in demand-side flexibility by modulating loads and contributing to grid management. By providing a common language to evaluate these capabilities, the SRI is designed to facilitate dialogue and comparability across the entire real estate value chain, from owners and investors to designers, technology providers and public authorities (ENEA, 2023).

Moreover, according to the Digital Economy and Society Index (DESI), a composite index that summarizes indicators on countries’ digital performance across several parameters, Italy has historically lagged behind the EU average in key dimensions such as integration of digital technology in businesses and digital public services, although recent years have shown some progress (European Commission, 2022). Similarly, the European Innovation Scoreboard (EIS), which provides instead a comparative assessment of research and innovation performance and classifies Member States into four groups (Innovation Leaders, Strong Innovators, Moderate Innovators and Emerging Innovators), classifies Italy as a “moderate innovator”, with structural weaknesses in R&D investment and innovation uptake among SMEs, which contributes to a slower and more uneven diffusion of digital solutions in sectors such as construction and real estate (European Commission, 2025a) .

In parallel, innovation itself is defined as the process of converting opportunities into new ideas and of applying these in practice, and according to innovation theory, organizations can actively manage this process to gain a competitive advantage (Vigren et al., 2022). In the context of real estate, innovation goes beyond simply adopting new tools: it alters how value is created, delivered, and captured across the supply chain. Technological innovation is therefore not limited to enhancing operational efficiency, reducing time and cost, or improving service and/or products differentiation. It has the potential to deeply transform entire business models, reconfigure supply chains, and redefine relationships among stakeholders. In a sector like real estate, characterized by long-standing structures and a complex network of actors, innovation tends to be incremental and gradual. This makes it a continuous and iterative process rather than a disruptive one (Tagliaro et al., 2024).

Despite being historically slower than other industries in adopting the technologies introduced by Industry 4.0, the real estate and construction sectors have recently experienced a surge of activity, especially from startups and new entrants. This lag can be attributed to two main factors, both linked to the intrinsic characteristics of the sector: on one hand, the sector’s reliance on traditional business models and its limited investment in R&D, standardization of processes, and lifecycle integration; on the other hand, the conservative mindset of many key stakeholders, who are often reluctant to embrace change (Tagliaro et al., 2024).

A clear indication of this scenario is the data showing that a high percentage of companies in the sector, with more than 10 employees, still exhibit low or very low levels of digitalization (*Figure 13*) (Mura, 2023).

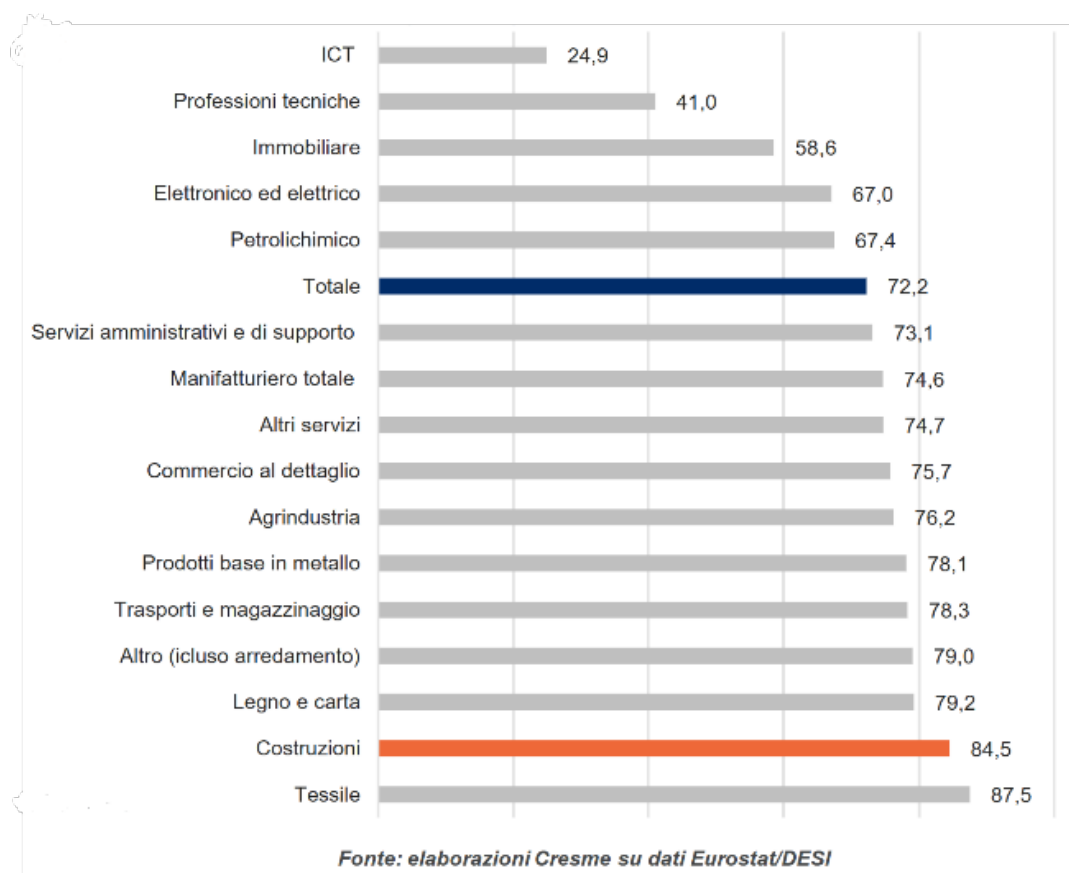


Figure 13: Percentage of companies per sector with more than 10 employees with low or very low digitalization. Source: Mura, 2023

Similarly, the DIG-IN-KPI project, which assesses the digital maturity of construction companies across several EU countries, reports an average digitalization rate of 33.87%, indicating that most firms are still at an early stage of digital transformation, with particularly large gaps in areas such as bills of quantities, financial evaluation and project monitoring (Darja Močnik et al., 2024).

Nonetheless, the rapid development and diffusion of digital technologies have significantly altered the landscape. Today, if the sector does not move toward digital innovation, it is probable that the digital world will reach into the sector (Tagliaro et al., 2024).

The accelerating pace of digital diffusion is driven by benefits on both the supply and demand sides. On the consumer side, economies of scale have made digital solutions more affordable and accessible, increasing their adoption and fostering a growing dependence on smart technologies. On the producer side, intense competition has driven rapid innovation, and this stimulates a continuous cycle of innovation by bringing new solutions and improvements to the market (Tagliaro et al., 2024). Additionally, many governments are actively supporting the digital transition through tax incentives, infrastructure investments, and innovation-friendly policies (Brown, 2018).

The ongoing process of digitalization and technological innovation has already produced, and continues to generate, both direct and indirect impacts on the real estate and construction sectors. Interestingly, not all of these impacts originate from within the industry itself. In fact, some of the most profound changes have stemmed from digital innovations in adjacent or entirely different sectors, which have significantly influenced the demand for physical space. For example, the widespread adoption of home banking services has led to a sharp reduction in the number of physical bank branches across national territories. Similarly, the explosive growth of e-commerce has triggered a dual effect: on the one hand, it has increased the demand for logistics hubs and warehouses; on the other, it has contributed to a

decline in demand for traditional retail stores. These examples highlight how digital innovation can reshape real estate needs even when the transformation occurs outside the sector itself (Tagliaro et al., 2024).

Alongside these indirect effects generated by Industry 4.0, there is an engine of innovation coming from the sector itself that goes by the name of PropTech. The term, a blend of “property” and “technology,” refers to a rapidly evolving domain that acts both as a catalyst of digital transformation and as a disruptive force capable of reconfiguring traditional business models, operational processes, and stakeholder relationships across the entire property value chain.

There are multiple definitions of PropTech, each emphasizing different but complementary aspects of the phenomenon. According to RICS (2025), PropTech can be broadly understood as general term referring to all the aspects that cover how technology and digital innovations affect the built environment, including startups that apply technology to tackle challenges within the real estate market. Baum (2020) provides a more nuanced interpretation, defining PropTech both as a collection of technological innovations in the property segment and as a new business sector in its own right. He describes it as a “movement driving a mentality change within the real estate industry and its consumers, particularly regarding technology-driven innovation in data management, transactions, and the design of buildings and cities.” Finally, the Italian PropTech Network (IPN) defines it as encompassing “solutions, technologies, and tools aimed at innovating the processes, products, services, and overall market of real estate” (Tagliaro et al., 2024).

Despite the variety in definitions, what they all have in common is a shared objective: to optimize the traditional real estate value chain by increasing efficiency, transparency, and effectiveness. This transformative movement has touched all three major segments of the industry - facility, property, and asset management - and has helped foster the emergence of a true ecosystem of innovation.

Today, the PropTech sector includes a wide array of business models, ranging from real estate management platforms to fintech services, digital transaction tools, construction tech solutions, data-driven analytics, and smart building maintenance and facility management systems (Tagliaro et al., 2021). While many of the key innovators in this space are startups, the PropTech landscape also increasingly includes small- and medium-sized enterprises (SMEs), large corporations, and even unicorns¹ that are driving the integration of technology across the real estate and construction industries (Baum, 2017).

In recent years, the sector has attracted a lot of capital, driven by the huge size of the real estate market amounting to a share of GDP in Europe of around 20% (Tagliaro et al., 2024). According to research conducted by Venture Scanner, there has been an increase in global investment in PropTech companies. As the chart shows, before 2014, investments were less than \$5 billion, while 2014 saw an increase to \$8 billion. However, it was only in 2018 that there was a record year for funding in the real estate technology sector, with nearly \$20 billion (*Figure 14*). In addition, financing for real estate technology has grown at a CAGR² of 62% over the past 5 years (Scanner, 2019). This growth trend was also recorded in 2019 when the share reached \$28 billion in investment.

¹ Unicorn company: is a privately held start-up company valued at over 1 billions of dollars. The term was coined by venture capitalist Aileen Lee. To date, there are 465 unicorn companies worldwide.

² CAGR (Compound Annual Growth Rate): represents the mean annual growth rate of an investment over a specified period longer than one year, assuming the profits are reinvested each year. It smooths out fluctuations to show a consistent growth rate over time.

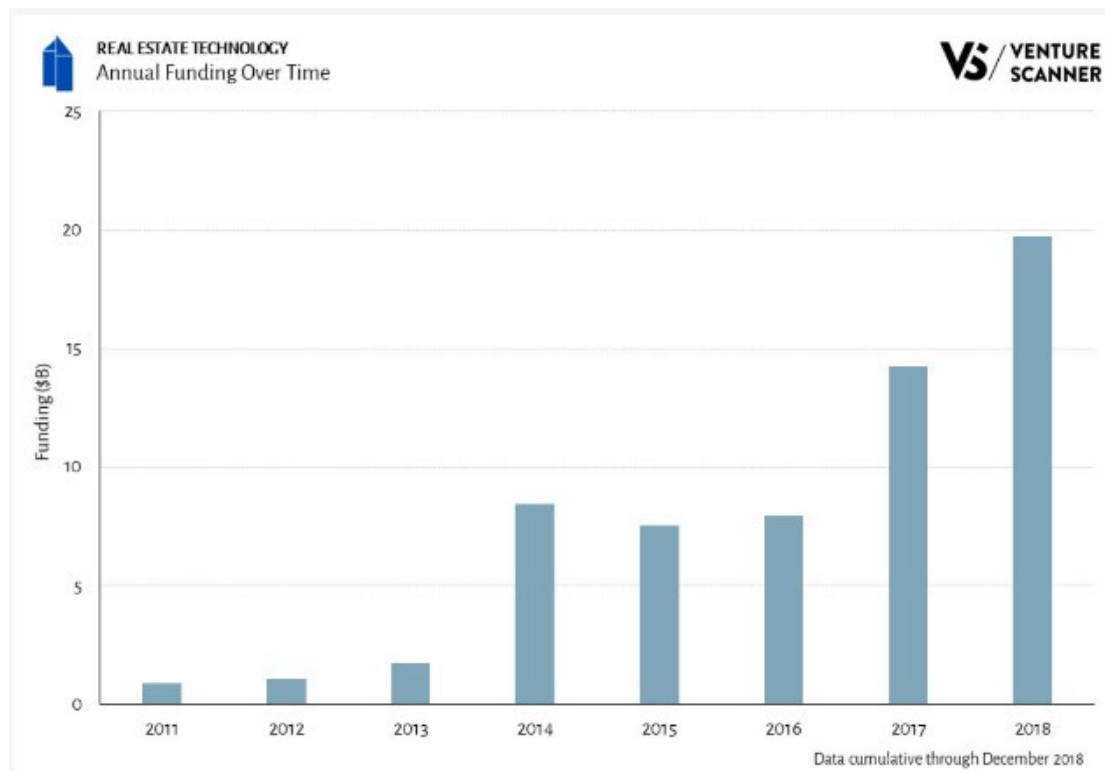


Figure 14: Real Estate Technology - Annual Funding (\$B) Over Time. Source: Venture Scanner, 2019

Despite the slowdown in the year 2020, probably due to the effects of the pandemic crisis, 2021 was the year that saw the largest amount of funding, with over \$30 billion, an unprecedented achievement. However, in 2022 and 2023, the PropTech sector experienced a recalibration of venture capital flow. In 2023, it reached an amount of \$11.38 billion, reflecting cautious investor sentiment, which represented a significant 64.44% decrease from 2021 investments. According to CRETI, this trend could also be attributed to the market volatility enhanced by monetary policy, rising interest rates, and recessionary fears. For these reasons, real estate organizations have adopted a more defensive position as entrepreneur-founders and investors navigate through a cautiously conservative landscape (CRETI, 2023).

In 2024, the PropTech industry faced a pivotal moment, reflecting both the resilience and adaptability of its key players. Thus, a phase of stabilization/slowdown of the industry at the global level seems to be emerging, which should also represent a phase of maturation and “rationalization” of PropTech investments at the global scale. The sector continues to attract attention for its potential to revolutionize an industry that has historically been slow to embrace technological change. Moreover, as the housing market continues to grapple with the implications of the pandemic, including the shift to remote work and the increased importance of residential space, PropTech solutions are more important than ever (CRETI, 2024).

CRETI (2025) has explored the trends, insights, and developments that defined the PropTech landscape in 2024. PropTech investments in 2024 highlighted clear sectoral trends, with construction emerging as the leader in funding (Figure 15). Residential, multifamily, and office sectors also experienced a strong year, reflecting the real estate industry's broad embrace of technology to meet evolving challenges. These investments demonstrate the growing reliance on innovative solutions to enhance efficiency, sustainability, and value creation across asset classes.

The construction sector dominated PropTech investments in 2024, securing \$4.50 billion. This surge underscores its critical role in driving innovation within the real estate ecosystem. These innovations

are improving project timelines, reducing material waste, and enhancing safety standards. Another important sector was the residential one which attracted \$3.60 billion in funding, highlighting its importance in addressing housing demand and evolving consumer preferences. PropTech solutions targeting this sector focus on streamlining property transactions, enhancing the homebuying experience, and integrating smart home technology. Innovations are reshaping how residential real estate operates, from online marketplaces to IoT-enabled devices.

These investments reflect the sector's resilience and adaptability. As consumers seek more seamless and personalized experiences, residential real estate remains a key area for PropTech innovation, offering significant growth opportunities for startups and investors.

Proptech Investments By Real Estate Sector

Where Proptech Capital is Creating Impact in Real Estate

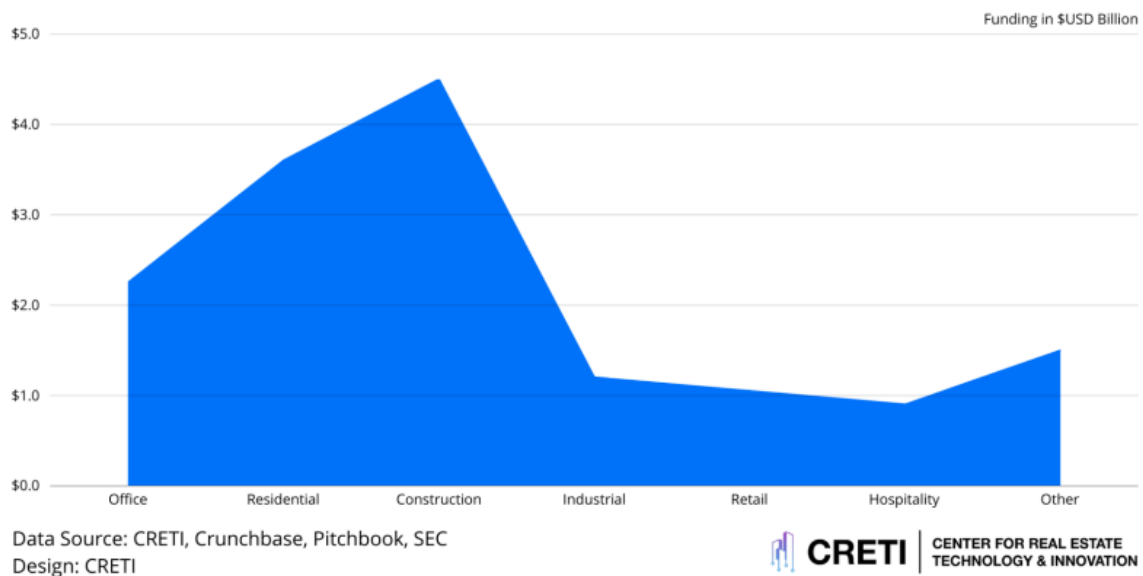


Figure 15: PropTech Investments (\$USD Billion) by Real Estate Sectors. Source: CRETI, 2025

One particular subclass of the residential sector related to the multifamily real estate has received \$2.95 billion in funding, continuing its role as a magnet for technological advancement. Startups in this sector are driving efficiency with AI-powered leasing platforms, predictive maintenance tools, and advanced tenant engagement systems. These solutions transform operations and create value for property owners and residents. This investment reflects the multifamily³ sector's adaptability to shifting market dynamics and tenant expectations. As urbanization persists and rental demand grows, multifamily remains a stable and attractive market for PropTech investors, delivering consistent returns and long-term growth potential.

Furthermore, new shared living models, such as co-living and co-housing, are key developments in the residential market. These concepts reflect a shift in lifestyle preferences, especially among younger generations, digital nomads, and urban professionals (JLL, 2017). By combining private living spaces with shared amenities and services, co-living fosters a sense of community while optimizing space and reducing housing costs.

³ Multifamily = Residential housing comprising multiple buildings within the same complex, whether single houses or condominium aggregates. This sector also includes co-housing projects, multi-unit housing complexes with large common spaces for collective use.

From an investment perspective, these models are particularly attractive in high-density urban areas, as they increase occupancy rates and operational efficiency (Siebrits et al., 2024). At the same time, they push developers and property managers to adopt digital platforms that facilitate communication, booking, maintenance, and community engagement; further reinforcing the role of technology in shaping the future of residential real estate.

From this perspective, PropTech should not be understood only as a niche of startups or as a temporary investment trend, but as an expression of a broader transition toward more data-driven, connected, and service-oriented forms of real estate organization.

This transition is also visible in the Italian context. According to the research conducted by IPN (Tagliaro et al., 2024), from 2018 to 2024, there has been a steady growth in the number of PropTech solutions, starting from 43 units and reaching 339, which were found in Italy or abroad, but they are operating in the Italian market, providing one or more digital technologies. Of these 339 companies, only 268 are registered/recorded in the “Registro delle Imprese” of the “Camera di Commercio”. About 73% of 268 companies originate in Northern Italy, in particular 103 in the Province of Milan, while in the center and south, there are respectively 17% and 10% of companies operating in the sector.

The analyses of the Italian PropTech ecosystem highlighted the substantial presence of small enterprises (70% of Italian PropTechs have fewer than 10 employees) with a high level of reliability, and about 55% of them with a minimal or below-average risk. In addition, the ecosystem is growing slightly but steadily, both in terms of the number of companies born between 2020-2022, but also in terms of the steady increase in the number of employees and turnover, which has almost doubled from 400 million to 800 million between 2020-2022.

Another relevant aspect analyzed by IPN is related to the fact that these PropTech companies employ more than one technology solution in a combined way with the average rising from 2.3 in 2020 to 3.05 in 2023. This trend reflects on the one hand the desire to integrate different activities and on the other hand the need to adapt to the evolution of the market, even employing several technologies simultaneously.

Further analyzing the technologies adopted by the Italian ecosystem, it emerges that the most relevant and present solutions are those related to data analytics and especially those that can fall into the following categories: “Big Data Analytics, Data Science and Data Sharing” and “Artificial Intelligence (AI) and Machine Learning (ML).” This result is in line with what was found in the recent study by Braesemann and Baum (2020) in which it is pointed out that the sector has been most impacted by those digital technologies that give greater importance attributed to data, and it is precisely these entities that have received the most funding. This also allows us to say that PropTech is transforming real estate into a data-driven market, and even if the core business of real estate remains material or spatial, the PropTech boom shows that essentially all processes related to the life cycle of a property can be digitized.

For the purposes of this thesis, however, the relevance of technological and digital advances lies less in the global expansion of PropTech investment than in the implications of digitalization for the residential sector and, more specifically, for complex multi-actor settings. In residential environments, digital technologies can support communication, maintenance coordination, information sharing, traceability, and service integration, all of which become increasingly important where buildings are managed through fragmented interactions among residents, managers, and service providers. This makes technological innovation particularly significant in settings such as condominiums, where fragmentation, information asymmetries, and weak integration often hinder the everyday functioning of the residential system.

2.1.6 The Impact of the Main Current Trends

Taken together, the drivers analyzed in this section demonstrate that the transformation of the real estate sector cannot be explained through a single trend, but rather through the interaction of spatial, demographic, economic, environmental, and technological forces.

In the Italian residential context, these dynamics affect not only the geography and composition of housing demand, but also the adequacy of the existing stock and the growing complexity of the organizational and managerial arrangements through which housing is maintained, upgraded, and inhabited. Urbanization intensifies territorial asymmetries and concentrates demand in accessible and service-rich areas; demographic change makes household structures more fragmented and residential needs more differentiated; geopolitical and economic instability affects affordability, investment capacity, and the timing of interventions; sustainability pressures expose the obsolescence of a large share of the stock and increase the urgency of retrofit processes; and digital innovation raises expectations for more integrated, transparent, and service-oriented forms of housing management. The following table (*Table 1*) summarizes the main implications of the drivers assessed in this section for the Italian residential context.

DRIVERS	Main impacts on the Italian residential context
URBANIZATION	Concentrates demand in accessible and service-rich areas, increases territorial disparities between central and marginal areas, and intensifies coordination needs in denser shared residential environments.
DEMOGRAPHIC SHIFTS	Increases demand for smaller, more accessible and flexible dwellings, highlights the mismatch between existing housing typologies and emerging household structures, and makes residential needs more heterogeneous.
GEOPOLITICAL AND ECONOMIC BACKDROP	Affects affordability, investment capacity, renovation timing, and the feasibility of interventions on shared buildings, especially where decisions depend on fragmented ownership and collective governance.
SUSTAINABLE DEVELOPMENT	Exposes the obsolescence of a large share of the Italian housing stock, increases pressure for renovation and compliance, and makes energy upgrading a central issue for multi-owner residential settings.
TECHNOLOGICAL AND DIGITAL ADVANCES	Raises expectations for more responsive and transparent housing services, enables new forms of monitoring and coordination, and highlights the need for more integrated management infrastructures in fragmented residential systems.

Table 1: Main drivers shaping the real estate sector and their implications for the Italian residential context. Source: Own elaboration

For the reasons explained above, the residential sector can no longer be interpreted only as a static set of physical assets, but must be understood as a dynamic field in which buildings, residents, services, governance mechanisms, and organizational infrastructures are increasingly interdependent. Against this background, the following section shifts from the level of external drivers to the structural characteristics of the residential sector, with particular attention to the Italian context and its positioning within the broader European landscape.

2.2 Residential Sector Structure and Trends: National Context and European Comparison

2.2.1 Structure of the Italian Residential Sector

The external drivers discussed in the previous section affect the residential sector in different ways depending on the structural characteristics of national housing systems. In the Italian case, understanding the current transformation of housing requires a closer examination of the ownership patterns, housing typologies, urban-rural distribution, building age, and energy performance, as well as of the tenure and market dynamics that shape access to housing and its everyday functioning. This type of analysis is essential to contextualize the current challenges and transformation dynamics.

Accordingly, this section examines the main structural features of the Italian residential sector by focusing on five interrelated dimensions: housing stock composition and ownership structure; use and occupancy patterns; building age and energy performance; rental market dynamics; and the broader implications of these trends for residential adaptation and management complexity.

These aspects provide crucial insights into why the Italian residential market responds differently to trends compared to other European countries and help explain the obstacles to improving housing quality, energy efficiency, and affordability. This analysis also lays the groundwork for the following chapters, which will explore how housing is being redefined as a service platform and how new residential models are emerging in response to evolving resident needs and stakeholder interactions.

2.2.1.1 Housing Stock Composition and Ownership Structure

To understand the current configuration of the Italian residential sector, it is first necessary to consider the scale and composition of the national building stock, which remains largely shaped by the existing built environment rather than by new construction. According to data from the 2011 ISTAT census, there are 12,187,698 buildings in residential use in Italy, plus 1,576,159 buildings or complexes of buildings (or 11.5% of the total) in non-residential use, for a total of 13,763,857 buildings or complexes of buildings in use. Between 2011 and 2021, 210,835 new residential buildings and 99,420 new nonresidential buildings (including those in productive use) were built, bringing the total number of residential buildings to about 12.4 million and non-residential buildings (or complexes of buildings) amounts to about 1.7 million (nearly 12% of the total) by 2021 (Caffari et al., 2024). This confirms the structural predominance of the existing stock within the Italian built environment and highlights the limited incidence of recent production in reshaping the overall housing system.

This broader building perspective is consistent with the picture offered by the cadastral data on residential real estate units. According to the latest report of the *Catasto Edilizio Urbano* (Agenzie delle Entrate & OMI, 2024), as of 31 December 2023, the real estate units registered in the cadastral categories of group A relating to residential use, i.e. from category A/1 to A/11, with the exclusion of A/10 (private offices and studies), amount to approximately 35.6 million. Compared to the previous year, there has been an increase of approximately 86 thousand units (*Figure 16*).

Categoria	Intestatari			Totale	Var % 23/22
	PF	PNF	BCC		
A/1	26.872	5.158	14	32.044	-1,4%
A/2	12.507.957	798.445	3.048	13.309.450	0,7%
A/3	11.915.506	1.037.825	4.459	12.957.790	0,2%
A/4	4.990.386	432.182	3.103	5.425.671	-0,6%
A/5	651.267	75.222	369	726.858	-2,0%
A/6	505.232	32.038	98	537.368	-2,2%
A/7	2.484.361	57.883	442	2.542.686	1,1%
A/8	27.466	6.104	29	33.599	-0,5%
A/9	1.608	854	4	2.466	-0,1%
A11	19.973	4.946	42	24.961	0,1%
Totale	33.130.628	2.450.657	11.608	35.592.893	0,2%

Figure 16: Number of residential real estate units by cadastral category and by type of owner and annual % variation. Source: Agenzie delle Entrate & OMI, 2024

Further analysis of the cadastral categories reveals that 89% of the residential units surveyed are divided into the following three subcategories: civil housing (A/2), economic (A/3), and popular housing (A/4). These typologies constitute the most representative part of the residential building stock, typical of ordinary Italian construction (Figure 17).

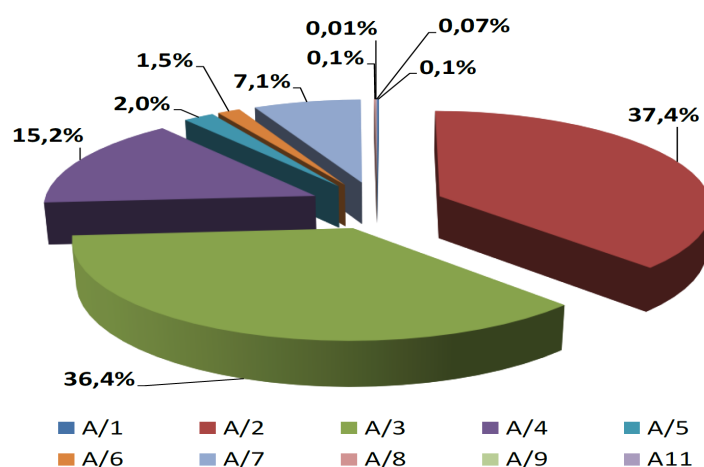


Figure 17: Distribution of residential real estate units by cadastral category. Source: Agenzie delle Entrate & OMI, 2024

From the perspective of ownership structure, the Italian residential sector is characterized by a very high incidence of private and highly fragmented ownership. Natural persons (PF – “Persone Fisiche”) own more than 33 million units, equal to almost 93% of the total. Less than 2.5 million units are registered in the name of non-natural persons (PNF – “Persone Non Fisiche”), i.e. entities, companies, or institutions. Finally, there are approximately 11 thousand units classified as non-censured common goods (BCC – “Beni Non Censibili”), which include, for example, condominium spaces such as stairwells or courtyards.

Wanting to analyze in more detail the distribution of the national residential stock among non-natural persons (PNF), according to *Assoimmobiliare* (Confindustria Assoimmobiliare, 2022), legal persons and companies with real estate purposes own 3.6% of the overall stock, which in 2021 amounted to 32.85 million homes, equal to 1.2 million housing units, while the public administration holds a share equal to 3.2%, for an absolute value of just over 1 million units. Financial companies and real estate funds own 1.6% of the entire national real estate assets, estimated at around 525 thousand housing units. The remaining share equal to 91.6% (30 million housing units) is in the hands of families themselves.

These data clearly suggest that the Italian real estate sector, particularly the residential one, is predominantly composed of individual properties rather than large institutional operators, whether public or private. This reflects a cultural and historical tradition deeply rooted in home ownership, considered in Italy not only as a consumer good but also as a form of investment and economic security. The result is a housing system in which property is widely dispersed among individual owners rather than concentrated in large professional operators, with important consequences for the management, renovation, and coordination of residential assets over time.

Indeed, by analyzing the entire real estate stock by type of owner (*Figure 18*), it emerges that individuals own approximately 90% of the units in groups A (residential) and C (commercial and different types of properties). The share drops to 56% for units A/10, intended for offices and private studies, an area in which ownership by companies is more frequent. On the contrary, PNFs are prevalent in groups B, D, and E, which include hospitals, schools, production facilities, infrastructures, etc. From this, it can be deduced that real estate ownership in Italy is strongly residential and private, intended mainly for the residence of the owning families.

Gruppo	Intestatari			Totale	Var % 23/22
	PF	PNF	BCC		
A (tranne A10)	33.130.628	2.450.657	11.608	35.592.893	0,2%
A/10	366.197	281.251	1.004	648.452	-0,4%
B	33.900	180.539	191	214.630	0,8%
C	26.135.732	2.965.488	79.600	29.180.820	1,1%
D	741.987	961.718	5.579	1.709.284	1,0%
di cui con r.c.	740.821	959.387	5.538	1.705.746	1,0%
di cui senza r.c.	1.166	2.331	41	3.538	-1,5%
E	20.458	158.593	207	179.258	0,3%
di cui con r.c.	16.600	90.042	170	106.812	0,8%
di cui senza r.c.	3.858	68.551	37	72.446	-0,3%
F	2.946.282	745.462	60.510	3.752.254	1,4%
Totale	63.375.184	7.743.708	158.699	71.277.591	0,7%

Figure 18: Number of real estate units by cadastral category and by type of owner and annual % variation. Source: Agenzie delle Entrate & OMI, 2024

The composition of the stock by building type further reinforces this interpretation. According to data from 2021, almost 39% of the Italian real estate stock consists of dwellings located in single- and two-family buildings, corresponding to 6.9 million in the former and 5.8 million in the latter (for a total of almost 2.9 million buildings). By contrast, only 6.6 million apartments (about 20%) are housed within the approximately 230 thousand buildings with more than sixteen homes, most widespread in the country's urbanized context (Confindustria Assoimmobiliare, 2022). This data suggests a very important distinctive characteristic of the Italian residential landscape: Italy is a country with a predominantly low population density, with a strong incidence of homes in single- and two-family buildings compared to large condominiums or multi-family residential complexes, typical of other European countries.

The features portrayed in this section are particularly relevant for the purposes of this thesis because they help explain why adaptation processes in the Italian housing sector are often slow, uneven, and difficult to coordinate. In a context where ownership is dispersed and the stock is largely inherited from past development cycles, the upgrading, management, and service integration of residential assets become inherently more complex, especially in collective settings such as the condominium.

2.2.1.2 Use and Occupancy of Residential Properties

After having outlined the composition and the ownership structure of the Italian housing stock, it is useful to analyze how these properties, and specifically these homes, are actually used and occupied by individuals (Figure 19).

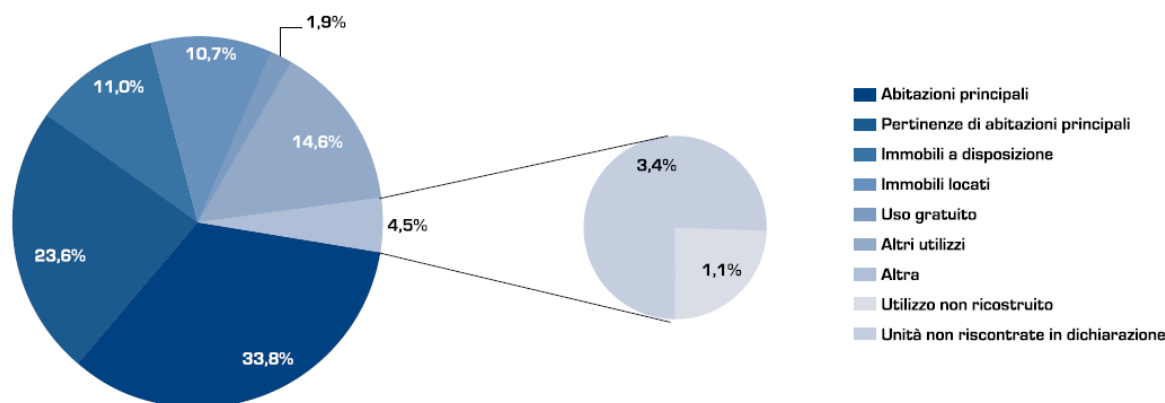


Figure 19: Use of real estate units owned by natural persons. Source: Agenzie delle Entrate & MEF, 2023

According to the report “*Immobili in Italia 2023*” (2023) drawn up by the *Agenzie delle Entrate*, out of 58.7 million real estate units registered in 2020, just over 19.8 million are used as primary residences, which are added approximately 13.9 million appurtenances (garages, cellars, attics). These two categories together represent 57.4% of the stock owned by individuals. This is followed by approximately 6 million rented units (11%) and a similar number of “available” units, i.e. second homes or properties not permanently inhabited. Finally, there are approximately 1.1 million units granted for free use, often to family members (Figure 20).

UTILIZZO anno 2020	Abitazioni (gruppo A escluso A10)	Pertinenze (C2-C6-C7)	Negozi e botteghe (C1)	Uffici e studi privati (A10)	Uso produttivo (gruppo D)	Altro uso (B, E, C3-C4-C5)	Totale
Abitazioni principali (1-6-11-12)*	19.819.410	2.354	174	137	145	64	19.822.284
Pertinenze di abitazioni principali (5)		13.861.388					13.861.388
Immobili a disposizione (2)	5.739.400	567.898	61.008	24.296	25.801	24.153	6.442.556
Immobili locati (3-4-8-14-16)	3.617.108	1.382.557	788.925	167.612	206.728	129.788	6.292.718
Uso gratuito (10)	775.087	307.944	8.578	3.679	6.305	5.645	1.107.238
Altri utilizzi (9-15-17)	1.417.739	5.733.222	589.258	153.405	355.224	316.911	8.565.759
Utilizzo non ricostruito	296.650	237.884	31.873	6.109	25.244	19.031	616.791
Unità non riscontrate in dichiarazione	1.035.034	693.041	91.243	14.544	116.756	58.558	2.009.176
TOTALE	32.700.428	22.786.288	1.571.059	369.782	736.203	554.150	58.717.910
PROPRIETARI DIVERSI DA PERSONE FISICHE	2.545.951	2.509.078	400.317	284.037	915.481	476.452	7.131.316
TOTALE	35.246.379	25.295.366	1.971.376	653.819	1.651.684	1.030.602	65.849.226

* Nell'utilizzo abitazioni principali compaiono anche altre categorie di immobili diverse dalle abitazioni. Questo non è una contraddizione ma il risultato dell'unificazione dell'utilizzo 1 (abitazione principale *strictu sensu*) con l'utilizzo 6 (utilizzo promiscuo). In altri termini vi sono immobili catastalmente censiti con destinazioni diverse dal residenziale, ma utilizzati in modo promiscuo anche come abitazione.

Figure 20: Number of real estate units by use and by cadastral category. Source: Agenzie delle Entrate & MEF, 2023

By focusing on the use of homes only, always owned by individuals, it emerges that 60.6% is used as the main residence by the owner's family, 11% is rented, 17% is available and the remaining 2.4% is granted for free loan. Assuming that each main residence corresponds to a single family, it turns out that 77.4% of families (there are approximately 25.6 million families in Italy in the two years 2019/2020, ISTAT data) live in homes they own, a figure that confirms the centrality of the owned home in the Italian housing model (Figure 21).

UTILIZZO anno 2020	Abitazioni (gruppo A escluso A10)	Pertinenze (C2-C6-C7)	Negozi e botteghe (C1)	Uffici e studi privati (A10)	Uso produttivo (gruppo D)	Altro uso (B, E, C3-C4-C5)	Totale
Abitazioni principali (1-6-11-12)	60,6%	0,0%	0,0%	0,0%	0,0%	0,0%	33,8%
Pertinenze di abitazioni principali (5)	0,0%	60,8%	0,0%	0,0%	0,0%	0,0%	23,6%
Immobili a disposizione (2)	17,6%	2,5%	3,9%	6,6%	3,5%	4,4%	11,0%
Immobili locati (3-4-8-14-16)	11,1%	6,1%	50,2%	45,3%	28,1%	23,4%	10,7%
Uso gratuito (10)	2,4%	1,4%	0,5%	1,0%	0,9%	1,0%	1,9%
Altri utilizzi (9-15-17)	4,3%	25,2%	37,5%	41,5%	48,3%	57,2%	14,6%
Utilizzo non ricostruito	0,9%	1,0%	2,0%	1,7%	3,4%	3,4%	1,1%
Unità non riscontrate in dichiarazione	3,2%	3,0%	5,8%	3,9%	15,9%	10,6%	3,4%
Totale	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%

Figure 21: Share (%) of the number of real estate units owned by natural persons by use and by cadastral category. Source: Agenzie delle Entrate & MEF, 2023

This pattern of use is closely related to the physical characteristics of dwellings. According to cadastral data, the average surface area of the dwellings registered in the archives, calculated as the ratio between the total cadastral surface area and the number of units, is approximately 118 m² at the end of 2023. In large urban centers, however, a progressive reduction in the average size of the dwellings is observed, a phenomenon that can be associated with the change in family structure, higher land values, and the growing demand for smaller and more affordable units (Agenzie delle Entrate & OMI, 2024).

These changes are consistent with the socio-demographic dynamics discussed in chapter “2.1.2 Demographic Shifts”. The increasing number of single-person households, delayed family formation, student mobility, and the growing presence of temporary urban populations are contributing to a stronger demand for smaller apartments located in central or semi-central urban areas, especially among young people, students, and workers. By contrast, households with children tend to seek larger dwellings and are more likely to move toward suburban or peri-urban areas that offer more space and better access to transport and local services. As a result, residential demand is becoming more differentiated not only in terms of tenure, but also in terms of dwelling size, location, and intensity of use.

Patterns of occupation also reveal a structural tension within the Italian housing system. On the one hand, the strong incidence of owner-occupied housing points to a stable and asset-oriented model, in which the house continues to function as a long-term family good. On the other hand, the presence of a substantial number of available dwellings and the growing mismatch between dwelling characteristics and emerging household profiles suggest that part of the stock is only partially aligned with contemporary needs. This is particularly relevant in a context where demographic ageing, shrinking household size, and greater residential mobility are gradually undermining the adequacy of traditional housing configurations.

In conclusion, it is remarkable to say that these trends are important because they show that the Italian residential sector is not defined only by widespread ownership, but also by specific ways in which space is occupied, shared, retained, or underused over time. In other words, the residential issue is not merely quantitative, concerning the number of dwellings available, but also qualitative and organizational, concerning whether the existing stock is able to respond to evolving living patterns. This interpretative shift is particularly relevant when moving toward collective residential contexts such as condominiums, where occupancy patterns, household composition, and everyday use of space directly affect management needs, service expectations, and coordination complexity.

2.2.1.3 Building Age and Energy Performance

Another important aspect to consider is the age of construction of Italian real estate, especially residential real estate since they make up the majority of Italy's housing stock. According to the recent housing census published by ISTAT (2024), 35,271,829 dwellings were recorded in Italy in 2021, of which about 20 million (56.3% of the total) were built between 1961 and 2000. It should be noted, however, that in the 40 years considered, more than 12.5 million dwellings (or about 63%) were built between 1961 and 1980, that is, in the time interval of the country's great post-war economic growth, which characterized Italy, especially in the 1960s. At the same time, a very substantial share of the stock predates this phase of growth. Dwellings with a year of construction before 1961 amount to nearly 11.5 million, corresponding to 32.4% of the total, while 6,308,009 houses, about 18% of the total, were built before 1945. Among the oldest assets, those that have already exceeded 100 years of 'life' (pre-1919) are around 3.3 million, equal to 9.5% of the total (Figure 22).

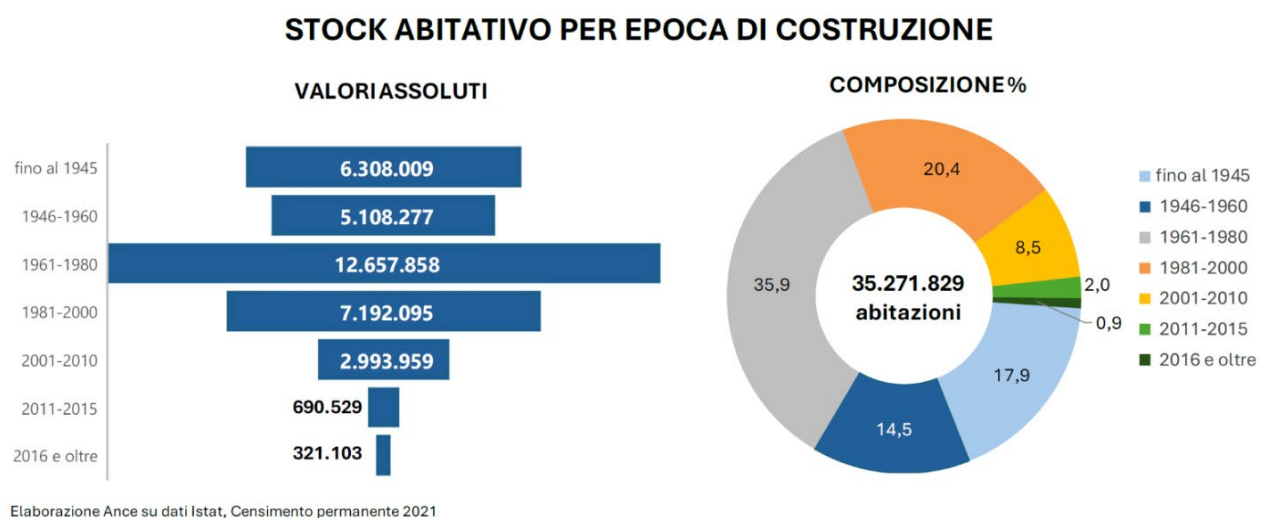
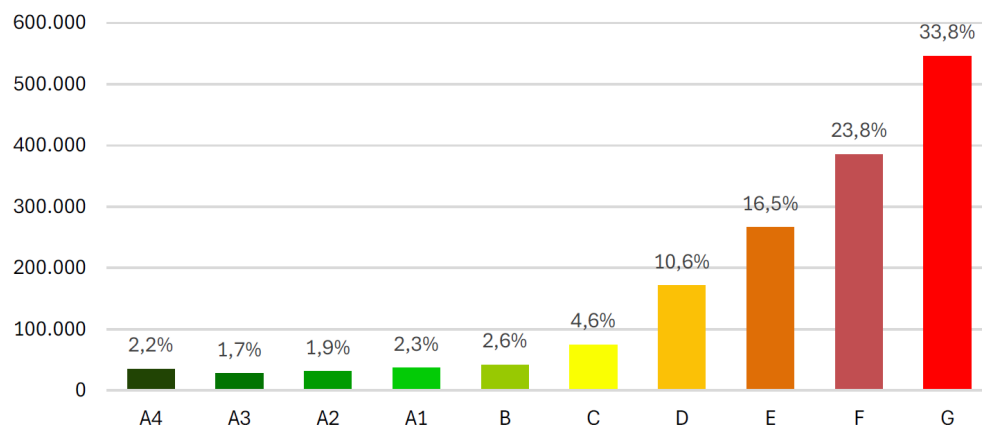


Figure 22: Housing stock by era of construction. Source: ISTAT, 2024

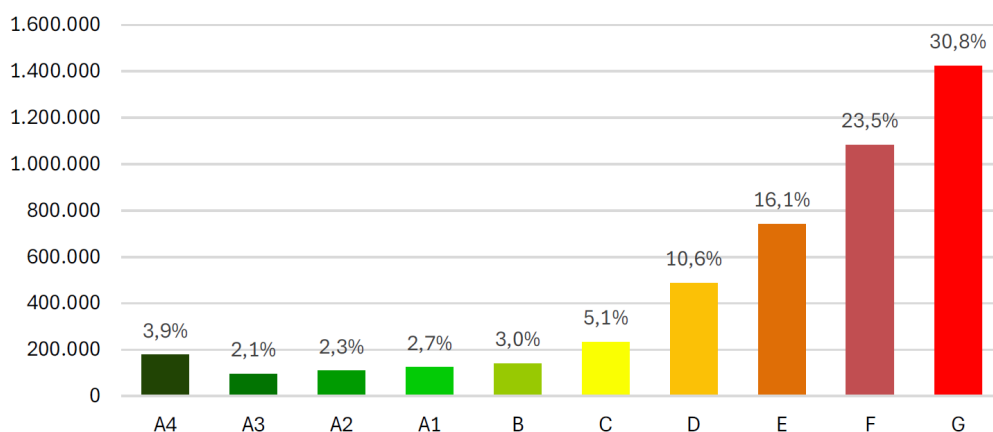
Since these buildings were built during historical periods when environmental and sustainability issues were still of little relevance and not addressed in a binding way by European and Italian regulations, in most cases they are characterized by high energy consumption and have high levels of CO₂ emissions. For this reason, the age profile of the stock is not only a descriptive feature of the Italian housing market, but also a structural explanation of its current difficulties in achieving widespread upgrading and compliance with new sustainability targets, as explained in chapter “2.1.4 Sustainable Development”.

The available data on energy performance certificates confirm this critical picture, although with some signs of gradual improvement. According to Enea's annual report on energy certifications and through data collected and available at the SIAPE (Sistema Informativo sugli Attestati di Prestazione Energetica) portal, there has been an improvement in average energy performance in recent years (Caffari et al., 2024). If one analyzes the data on SIAPE at the beginning of 2020 (based on certificates issued up to 12/31/2019) and compares it with the updated data at the beginning of 2024 (based on certificates issued up to 12/31/2023), it can be seen that while in 2019, 74.1% of properties fell into the least efficient energy classes (E, F, and G), while only 8.1% were assigned a class higher than B (A1-A4), in 2023 there was a reduction in the number of APEs in the lowest energy classes E, F, and G (70.4%) and an increase in properties certified in classes A1 to A4 (11%) (Figure 23 & Figure 24). Over the same period, the weighted average value of the overall non-renewable energy performance index in 2019 was 197.7 kWh/m² per year, while, in 2023, it dropped to 185.4 kWh/m² per year, confirming the improvement in the average energy characteristics of buildings.



Fonte: Elaborazione ENEA

Figure 23: Distribution by energy class of residential APEs issued up to December 31, 2019. Source: ENEA report made by Caffari et al., 2024



Fonte: Elaborazione ENEA

Figure 24: Distribution by energy class of residential APEs issued up to December 31, 2023. Source: ENEA report made by Caffari et al., 2024

This data should, however, be interpreted with caution. As noted in the ENEA report, the SIAPE sample cannot be considered fully representative of the entire Italian building stock because the proportion of APE certified properties remains limited, especially in tertiary sector and for certificates issued before 2020. Even so, the data remains useful for identifying the general direction of change and for highlighting the persistent weight of low-performing buildings within the national residential stock.

A more detailed reading of the relationship between construction period and energy class further clarifies this pattern. The study conducted by ENEA (ENEA & ICT, 2024) shows that the energy class of buildings tends to improve as regulations evolve, requiring increasingly stringent energy performance targets, and the results show a generalized increase in the efficiency of the building stock. Although pre-1991 cases are characterized by a strong presence of buildings with less efficient performance (Figure 25), comparison with data from the previous Report shows a significant improvement, with an increase in the percentage of cases in energy classes A4-B and a subsequent reduction in classes F-G. Specifically, F-G energy classes are significantly reduced to around 14.5% (2.6% compared to 2022), while A4-B classes exceed 34% (up 6% compared to 2022). Properties built between 2016 and 2023 have the best energy performance, with about 84.5% of cases in A4-B energy classes (+3.9% compared to 2022).

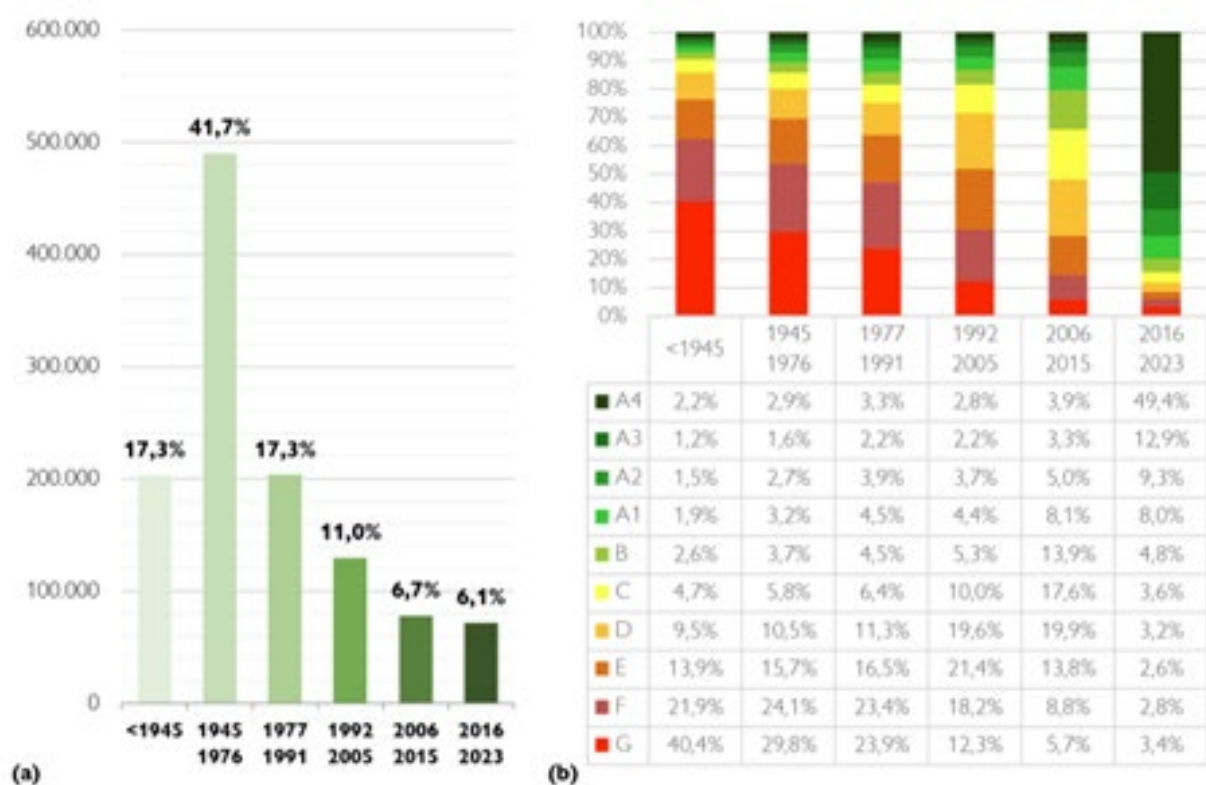


Figure 25: Distribution of APEs by period of construction (a) and percentage distribution of APEs by period of construction and energy class (b) (N= 1,177,397). Source: ENEA & ICT, 2024

The role of regulation is particularly evident in relation to the minimum energy performance requirements introduced and updated over time. As a matter of fact, the effects of the minimum requirements of *Ministerial Decree 26/06/2015*, concerning the application of energy performance calculation methodologies, result in the largest increase in the percentage of better energy classes (A4-B) compared to previous construction periods. The effects of regulatory changes are also evident in the analysis of the medians of the performance indices and CO₂ emissions (*Figure 26*), with their decrease the more recent the building, except for EP_{gl,ren}, which, on the other hand, is increasing due to the requirements for the use of renewable energy sources.

Destinazione d'uso	Periodo di costruzione	n. APE	EP _{gl} [kWh/m ² anno]	EP _{gl,ren} [kWh/m ² anno]	EP _{gl,ren} [kWh/m ² anno]	EP _{H,nd} [kWh/m ² anno]	CO ₂ [kg/m ² anno]
Residenziale	Pre 1945	165.126	223,7	200,6	2,7	129,7	40,2
	1945 - 1976	409.995	182,4	165,5	3,3	97,2	33,5
	1977 - 1991	161.691	167,5	150,5	2,7	90,7	30,3
	1992 - 2005	102.542	151,4	137,1	2,5	79,3	27,5
	2006 - 2015	64.618	121,6	104,0	4,6	54,0	21,2
	2016 - 2023	61.287	78,2	32,0	41,3	28,5	7,1
Non residenziale	Pre 1945	26.260	315,2	266,9	18,4	151,8	56,2
	1945 - 1976	47.864	303,9	261,7	17,0	150,2	54,7
	1977 - 1991	24.894	282,7	242,2	15,9	138,0	50,6
	1992 - 2005	20.351	272,9	227,7	22,3	121,6	48,3
	2006 - 2015	10.123	239,1	186,3	32,9	93,6	40,3
	2016 - 2023	6.017	173,8	107,8	53,8	65,6	24,3

Figure 26: Distribution of median values by construction period for residential (N=965,259) and nonresidential (N=135,509) properties. Source: ENEA & ICT, 2024

As far as Italy is concerned, various steps were taken towards making the country's dwelling stock more energy-efficient. A first relevant step was the introduction of the 1998 *Budget Law* that introduced tax credits for housing renovations ("*Bonus casa*"), followed in 2007 by the extension of incentives to include energy-efficiency retrofits ("*Ecobonus*"). In 2020, the so-called "*Rilancio*" Decree, besides measures to support the economy during the COVID-19 pandemic, introduced a substantial policy intervention ("*Superbonus*") to pursue the energy saving and GHG emissions reduction targets outlined in the 2019 *Integrated National Energy and Climate Plan* (PNIEC). The "*Superbonus*" allowed for a 110% tax credit on energy efficiency renovations, provided that the building improved its energy performance by two classes. It has been estimated that the "*Superbonus 110%*", together with the "*Façade bonus*", had a cost of around €170 billion over the period 2020–2023 (Accetturo et al., 2024).

The scale of these interventions was particularly significant. According to data from ENEA (ENEA, 2023) consolidated at December 31, 2022, the total number of asseverations related to the "*Superbonus 100%*" is 352,101 units, for a total of approximately 60.76 billion euros of eligible investments (45.2 billion for works already completed), from which non-renewable primary energy savings for the total projects contained in the ENEA database is 9,050.04 GWh/year. The charts in Figure 27 compare the details by property type of the investments mobilized for works already completed as of December 31. As shown, condominiums accounted for the largest share of mobilized investments, around 44% in 2021 and 43% in 2022, followed by single-family buildings and detached units.



Figure 27: Superbonus: Investments made by building type (%). Source: ENEA, 2023

A similar, though more gradual, contribution also emerges from the “Ecobonus”. In 2022, the number of interventions supported by this measure was 940,686, down from 1,039,901 in 2021, while related investments amounted to 6,823.2 million euros against the 7,537 million euros mobilized in the previous year (Figure 28). Since 2014, more than 4.6 million interventions have been carried out under the “Ecobonus”, and since its introduction in 2007, the total number has reached about 6.4 million, with investments of nearly 60 billion euros overall. Most of the energy savings generated by the “Ecobonus” derive from the replacement of winter heating systems, which account for 64.7% of interventions, followed by the replacement of windows and doors at 20.6%.

Tipologia di Intervento	Numero	%	M-euro	%	GWh/a	%	Vita utile	Costo efficacia (euro/kWh)
Condomini	210	0,02%	56,6	0,83%	11,9	0,56%	30	0,13
Riqualificazione globale	2.011	0,21%	123,6	1,81%	34,7	1,62%	30	0,11
Coibentazione involucro	12.230	1,30%	604,9	8,87%	236,8	11,09%	30	0,08
Sostituzione serramenti	193.639	20,58%	2.383,0	34,92%	501,7	23,49%	30	0,12
Schermature solari	111.650	11,87%	482,4	7,07%	16,5	0,77%	10	1,38
Pannelli solari per ACS	10.064	1,07%	65,9	0,97%	57,5	2,69%	15	0,09
Climatizzazione invernale	608.518	64,69%	3.085,1	45,22%	1.273,3	59,62%	15	0,16
Building automation	2.364	0,25%	21,7	0,32%	3,3	0,15%	10	0,35
Totale	940.686	100%	6.823,2	100%	2.135,7	100%		

Figure 28: Ecobonus: Number of interventions made by type, year 2022. Source: ENEA, 2023

In conclusion, the analysis shows that the advanced age of Italy's housing stock poses a significant challenge in terms of energy efficiency and sustainability. Indeed, a large proportion of buildings, built before the 1980s, are energy-intensive and responsible for high CO₂ emissions. However, regulatory developments and incentive policies, particularly “Ecobonus” and “Superbonus”, have initiated a significant upgrading process. Data show a gradual improvement in energy classes, especially in newer buildings, with a clear reduction in the lowest-performing classes. To consolidate these results, it will be crucial to ensure the continuity of public policies and promote a widespread culture of building

sustainability. This point is also relevant because it shows how the residential question in Italy is deeply linked to the technical, organizational, and economic complexity of adapting an old and fragmented built environment to contemporary performance standards and regulatory requirements.

2.2.1.4 Rental Market Trends and Access Conditions

Alongside ownership, renting also represents a significant component of the Italian residential market, although it remains structurally less central than in many other European housing systems. According to the *“Immobili in Italia 2023”* report (Agenzia delle Entrate & MEF, 2023), as regards rental properties, the 2020 database of rented homes is made up of approximately 3.6 million residential real estate units. Of these, approximately 3.2 million (87%) are rented by individuals, while almost 500,000 (13%) are rented by other entities (companies, bodies, institutions). These data confirm that the Italian rental market is still largely based on small-scale private ownership rather than on large institutional operators.

This ownership structure has important implications for how the rental market functions. Since supply is dispersed among a very high number of individual landlords, the market tends to be fragmented, weakly professionalized, and strongly influenced by local conditions rather than coordinated by large operators with standardized models and long-term asset management strategies. In this respect, the rental segment reflects the broader configuration of the Italian residential system, which remains deeply rooted in household ownership and in the role of housing as a family asset.

Territorial differences further reinforce this fragmented profile. The average surface area of rented homes in 2020 was 95 m² at the national level, with lower average sizes in the North-West regions and larger ones in Southern Italy. Annual rents also show marked regional differences, with minimum average values below 4,500 euros per year in Basilicata and Calabria, and values exceeding 7,000 euros per year in Lombardia and Trentino-Alto Adige. These variations reflect the influence of local purchasing power, urban concentration, housing demand, and territorial attractiveness on rental conditions (Agenzia delle Entrate & MEF, 2023).

Recent market evidence points to growing pressure on rents, especially in urban areas. According to the *“Sondaggio congiunturale sul mercato delle abitazioni in Italia - 4° Trimestre 2024”* (Banca d'Italia, 2025), the recovery in demand has significantly pushed the increase in rental prices. In fact, operators' opinions on rental rates are at the highest level compared to previous years. This pressure is linked to a strong mismatch between robust demand and a limited supply of available homes. The same survey highlights that this imbalance is partly exacerbated by the growing preference of owners for short-term rentals of less than 30 days, especially in urban centres and tourist locations. According to real estate agents, this trend also has an impact on the sales market: on the one hand, it reduces the number of properties available for sale; on the other, it stimulates the purchase of homes to allocate them to tourist rentals, thus influencing both sales volumes and prices (Banca d'Italia, 2025).

The data published by the *Osservatorio del Mercato Immobiliare (OMI)* (2025) for the fourth quarter of 2024 confirm these trends. In particular, the number of homes rented with ordinary long-term contracts declined by 2.7% compared with the same quarter of 2023, while annual rents remained broadly stable in that segment. By contrast, temporary rentals with a duration between one and three years increased by 2%, with annual rent levels rising by almost 8% at the national scale and in municipalities with high housing tension (a.t.a. – “alta tensione abitativa”). Agreed rent rentals (“locazioni a canone concordato”) also increased by +1%, while the segment of subsidized rentals (“locazioni agevolate”) recorded a strong increase in both the number of contracts signed and the levels of rent applied. These data testify to a growing diversification of the rental market and the search for more flexible solutions by tenants, especially young people and university students.

However, it should be noted that the reasons for choosing between renting and owning are complex and heterogeneous. On the one hand, socio-economic variables such as income, age, level of education, and employment status come into play; on the other, market factors such as rent costs, sale prices, accessibility to credit, and availability of mortgages. Understanding the relative weight of each factor is essential to analyze the dynamics of the rental market and to design effective policies to combat housing hardship.

In this context, renting is the most widespread form among the less well-off groups. Among households with equivalent income in the first quintile⁴, 32% live in rented accommodation. This percentage drops to 11% for households belonging to the fifth quintile, i.e. those with the highest incomes. Furthermore, according to *ISTAT* data from 2022, the incidence of absolute poverty among families in rented accommodation reaches 18%, compared to 4% among those who own. These data suggest that renting is often a forced choice for those who do not have the economic resources necessary to purchase a property (Agenzia delle Entrate & MEF, 2023).

The issue of access therefore extends beyond affordability in a narrow monetary sense. Access to affordable housing is a fundamental human need and a central dimension of individual well-being, especially for those families with low incomes. In Italy, as in the rest of the European Union, these families face not only economic difficulties but also qualitative barriers. They often live in smaller, less energy-efficient homes with fewer services. Moreover, this social class is also typically subject to overcrowding. In almost all European countries, families belonging to the lowest income quintile have a significantly higher rate of overcrowding than those with medium or high incomes. These inequalities directly impact the functioning of the rental market by increasing its rigidity and limiting housing mobility (Agenzia delle Entrate & MEF, 2023).

On the contrary, if we consider the phenomenon of housing under-occupancy, that is when a house is considered too large for the needs of the family unit that lives there, in the EU in 2022, a third of the population, 33.6% of the total, lived in an under-occupied home, in Italy this percentage stood at around 16.6%, significantly lower than the European average (Confindustria Assoimmobiliare, 2022). The low rate of underemployment in Italy does not reflect greater efficiency in the use of living space, but rather the peculiarities of the Italian family model: the long permanence of young people in their parents' home, low housing mobility and a cultural attachment to the home as an identity asset. These elements, together with economic barriers and the lack of intermediate housing alternatives, explain the lower incidence of oversized homes compared to the family unit that occupies them.

Several social and demographic variables further influence the probability of living in rented accommodation. According to the analysis of the Agenzie delle Entrate (Agenzia delle Entrate & MEF, 2023), educational qualifications also significantly affect the probability of living in rented accommodation. Subjects with a high school diploma or a university degree show a lower propensity to rent, probably due to the positive effect of education on the so-called "permanent income". Similarly, the employment status has a statistically significant impact: managers, pensioners, entrepreneurs, and employees are less inclined to live in rented accommodation than workers, the reference category with the highest probability of being renters.

The structure of the family unit represents a further explanatory variable: families composed of two people are more frequently renters than single-person families. Age is also relevant: individuals between 35 and 44 show a greater probability of living in rented accommodation than the under-35 age

⁴ The so called "*quintili di reddito equivalente*" divide the population into five equal groups based on income, adjusted for household composition. The first quintile represents the poorest 20% of the population, while the fifth quintile includes the 20% with the highest incomes.

group, which includes many young adults still living with their parents. It is worth noting that over 70% of young people between 20 and 29 still live with their parents, a figure that reflects both the difficulties in accessing the real estate market and the lack of sustainable housing alternatives (Agenzia delle Entrate & MEF, 2023).

Finally, the degree of urbanization directly affects rental dynamics. People who live in rural areas show a lower probability of being a renter, in favor of ownership. On the contrary, urban contexts, which are more dynamic and dense, tend to attract a greater share of renters, confirming the strong polarization between cities and internal areas, with urban centres concentrating both opportunity and housing pressure (Agenzia delle Entrate & MEF, 2023). In the same framework, the share of the population residing in smaller urban centers is around 40%, while for rural centers it is less than 20%, demonstrating the fact that the majority of the population lives in a widespread and intermediate residential fabric (Confindustria Assoimmobiliare, 2022).

The rental market must therefore be interpreted as a strategic lens through which broader tensions in the Italian residential system become visible. On the one hand, it reveals the persistence of a fragmented and predominantly private supply structure. On the other hand, it highlights growing pressure from households that cannot or do not want to access ownership, but who face increasingly constrained, differentiated, and often expensive rental options. This tension is particularly relevant for the purposes of this thesis, because it shows how the Italian housing question is increasingly linked not only to property ownership, but also to the capacity of the residential system to offer accessible, flexible, and adequately managed solutions for different user groups.

2.2.1.5 Residential Transactions and Market Signals

Recent trends in residential transactions provide useful additional evidence on the current configuration of the Italian housing market, especially with regard to the persistence of homeownership demand, the role of credit conditions, and the still limited capacity of the housing stock to respond to changing qualitative needs. According to the “*Dati Statistici Notarili*” report (Consiglio Nazionale del Notariato, 2025), the number of residential transactions grew by 15.8% in 2024 compared to the previous year, reversing the negative trend and returning to 2021 levels. In particular, purchases by private individuals increased by 26.8% and those by businesses by 17.4%. Real estate prices are also growing: the average value of a house purchased went from €154,416 in 2023 to €166,395 in 2024 (+7.8%). For properties purchased by private individuals with the “*prima casa*”⁵ benefit, the median value stands at €119,000. This increase is influenced by several factors, including the rise in renovation costs and construction materials.

The provision of mortgages confirms this trend: after a 26% drop between 2022 and 2023 - due to the increase in interest rates and difficulties in accessing credit - in 2024 there was an increase of 5.7%, with 340,611 loans granted. Although pre-pandemic levels have not yet been reached, the recovery suggests a gradual improvement in the market. The total capital granted for mortgage loans also confirmed the increase in activity in the Italian residential market, recording a growth of +9.1% compared to the previous year. This increase was driven above all by first home purchases: 55.31% of homes were purchased by taking advantage of the benefits provided for the “*prima casa*”, a figure that confirms the centrality of primary housing demand, often supported by tax incentives. In line with this trend, the most active age group in the real estate market is between 18 and 35, which accounted for 26.52% of transactions in 2024. This data suggests a renewed interest from younger generations, and

⁵ The “*prima casa*” incentive provides tax reductions for individuals purchasing their first primary residence in Italy. It provides reductions on registration, mortgage, and cadastral taxes, subject to specific requirements such as residence in the municipality and the absence of other property ownership.

especially couples, in purchasing a home, often considered a safe investment and an important step towards independent living.

According to the “*Sondaggio congiunturale sul mercato delle abitazioni in Italia - 4° Trimestre 2024*” (Banca d'Italia, 2025), recent upward pressures on prices have been mainly fueled by the recovery in demand. Operators' assessments of the number of potential buyers have improved significantly compared to 2023. However, the supply of housing continues to remain weak and unresponsive, especially in the face of the changed housing needs that have emerged in the post-pandemic period. In particular, there is growing attention to the quality of interior spaces, technological equipment, and energy performance, towards which the existing real estate stock is still struggling to renew itself. Demand has been further supported by favorable credit conditions, with a significant increase in the share of purchases financed by mortgages.

Further significant evidence concerns the type of properties bought and sold. According to the *Banca d'Italia* (2025), over 80% of sales in 2024 involved pre-existing properties. 38% of homes sold are small, less than 80 m², demonstrating the prevalence of small families or singles among buyers. It is interesting to note that properties with low energy efficiency (classes F-G) account for 56% of transactions, with a higher concentration in the Central and Southern regions. On the contrary, in non-urban areas the sale of highly efficient properties (classes A-E) is more widespread, representing 44% of the total. This data highlights a certain polarization between urban and rural demand and suggests that energy efficiency is becoming an increasingly relevant choice criterion.

Finally, the *OMI* (2025) reports a particularly interesting trend in the new construction segment. Although existing homes remain the dominant segment, the fourth quarter of 2024 recorded an exceptional increase of 46% in sales of new buildings compared to the same period in 2023. This is the highest value in the last four years. This anomalous peak is mainly attributable to the expiry, set for 31 December 2024, of the so-called “*Sismabonus Acquisti*”. This tax measure incentivized the purchase of real estate units resulting from demolition and complete reconstruction by construction companies, aimed at reducing seismic risk. It is therefore likely that this trend is temporary and linked to exogenous factors, but it still represents a signal of the potential impact that fiscal policies can have on real estate demand.

Overall, transaction dynamics confirm some of the main characteristics already observed in the Italian residential sector. Demand for ownership remains strong, especially for first homes, but it is directed predominantly toward existing dwellings and is therefore still embedded in a housing system marked by ageing buildings, uneven quality, and slow stock replacement. For the purposes of this thesis, these market signals are relevant not so much as an autonomous field of analysis, but because they reinforce the idea that the transformation of Italian housing continues to take place largely through the adaptation, management, and incremental upgrading of an inherited and fragmented built environment.

2.2.1.6 Synthesis of the Main National Trends and Structural Implications

The analysis carried out in the previous sections shows that the Italian residential sector is characterized by a combination of structural features that make its transformation gradual and uneven. The system is still largely based on widespread small-scale private ownership, a limited presence of institutional operators, and a strong cultural preference for homeownership, while the rental market remains relatively fragmented and under pressure, especially in urban contexts. This widespread ownership structure reflects a cultural and social tradition rooted in our country, in which the home represents not only a primary asset but also a form of investment and economic security. At the same time, the Italian housing stock is marked by advanced age, slow replacement rates, and a significant prevalence of existing buildings with uneven energy performance and limited adaptability to contemporary housing needs. This mismatch between inherited stock and emerging demand affects

both access to housing and the broader capacity of the system to respond to new expectations in terms of quality, flexibility, efficiency, and affordability. These patterns also have important territorial and social implications. Housing access and quality are increasingly differentiated by income, age, tenure, and location, with stronger tensions in urban areas, greater vulnerability among renters and lower-income households, and more limited pathways to residential autonomy for younger generations. At the same time, the coexistence of single-family homes, small multi-family buildings, and condominium-based housing confirms the heterogeneity of the Italian residential fabric and the absence of a dominant, fully standardized residential model. It has also found that sales are mainly driven by the purchase of the first home and supported by credit conditions that have returned to be favorable, while the rental market is affected by a limited and fragmented supply, influenced by the absence of large institutional operators and, in part, also by the phenomenon of short-term rentals. Fiscal policies can also have a significant impact on sales volumes, stimulating specific segments such as new construction and first homes.

Taken together, these elements suggest that the Italian residential sector evolves less through rapid structural renewal than through the gradual adaptation of an old, fragmented, and highly dispersed built environment. This condition is particularly relevant for the purposes of this thesis because it helps explain why processes of management, coordination, and upgrading become especially complex in collective residential settings such as the condominium, where fragmented ownership and shared responsibilities intensify organizational and relational challenges.

2.2.2 European Residential Sector: A Comparative Analysis

After analyzing the main characteristics and dynamics of the Italian residential sector, it is useful to position this case within a broader European perspective. The comparison developed in this chapter focuses on France and Germany, two relevant reference contexts that differ from Italy in terms of socio-economic characteristics and housing policies. The aim is to highlight the main similarities and differences, identify common and emerging trends, and reflect on present and future challenges. This type of analysis allows to distinguish which criticalities are specific to the national housing model, which are more widely shared, and how different ownership structures, housing policies, and residential configurations may influence the capacity of housing systems to respond to ongoing social, environmental, and organizational changes.

To support this transition, *Table 2* summarizes the main characteristics discussed in section “2.2.1 Structure of the Italian Residential Sector” and provides a synthetic reference framework for the comparative analysis that follows. Building on these dimensions, the next paragraphs examine selected similarities and divergences between Italy, France, and Germany with regard to ownership and tenure patterns, housing types, building age and energy performance, territorial distribution, housing conditions, market pressures, and socio-demographic trends.

CHARACTERISTIC	KEY DATA	REMARKS
OWNERS: INDIVIDUALS VS INSTITUTIONS	Natural persons: 93% of the residential stock (~33 million units); Institutions/private investors: ~7%	The market is dominated by small private owners, with a very limited presence of institutional investors.
OWNERSHIP VS RENTAL	Ownership: 77.4% of households live in their own home; Rental: 11%	A strong cultural preference for ownership; rental is concentrated among low-income groups and in urban areas.

HOUSES VS APARTMENTS	39% in single-/two-family homes; only 20% in buildings with more than 16 units	Prevalence of single-/two-family dwellings and a limited number of large apartment buildings.
BUILDING AGE AND ENERGY PERFORMANCE	32.4% built before 1961; 63% between 1961-1980; <15% in classes F-G in 2023	The housing stock is very old but improving thanks to incentives (<i>Superbonus</i> , <i>Ecobonus</i>).
URBAN VS RURAL AREAS	>40% live in smaller urban areas; <20% in rural areas	Higher demand and rental activity in cities (including short-term rentals); in rural areas, ownership and larger homes prevail.
SIZE / OVERCROWDING / UNDER-OCCUPANCY	Avg. size: 118 m ² (owned), 95 m ² (rented); higher overcrowding among low-income households; under-occupancy at 16.6%	Low-income families often live in overcrowded conditions; under-occupancy is limited and influenced by cultural factors.
PRICES (RENT AND SALES)	Rent: from <€4,500/year (South) to >€7,000/year (North); Sales: +7.8% (2024), avg. €166,395	Rising prices (both rent and sale), especially for small and energy-efficient units; strong demand-side pressure.
SOCIO-DEMOGRAPHIC CHANGES	Ageing population; smaller households; >70% of 20–29-year-olds live with parents	Preference for smaller, well-connected suburban homes; young adults face challenges in accessing independent housing.

Table 2: Key Characteristics of the Italian Residential Sector. Source: Own elaboration

2.2.2.1 Housing Ownership: Natural Persons Vs Legal and Institutional Actors

As represented in the previous chapter, the Italian residential real estate stock is strongly characterized by widespread private ownership: most of the housing units are occupied by their respective owners, while the share of properties intended for rental or unused remains relatively limited. According to 2021 data (Confindustria Assoimmobiliare, 2022), less than 3 million units (out of a total of 32.85 million) are owned by legal entities other than natural persons, such as public institutions or private companies. The public and social housing sector also plays a marginal role, representing only about 4% of the entire housing stock, with a significant presence only in some regions (European Commission. Directorate-General for Employment, Social Affairs and Inclusion, 2024). This differs a lot from other European countries.

For instance, the French and German context presents different characteristics from Italian ones (*Figure 29*). In 2021, out of a total of approximately 34.6 million housing units, only 51% were owner-occupied (approximately 17.65 million units), while rented homes reached 6.9 million, corresponding to 22%. Second homes represented 11% of the total, for an absolute value of approximately 3.8 million. A distinctive element is the strong incidence of social housing, which covers approximately 16% of the national housing stock, equal to approximately 5.5 million homes, a significantly higher share than the Italian one (Confindustria Assoimmobiliare, 2022).

In Germany, the situation is even further from the Italian model. Of a total of approximately 42.3 million housing units, only 43% are owner-occupied (approximately 18.2 million), while 45% are intended for rent (over 19 million units). The public housing stock amounts to approximately 2.1 million units (5%), while the units attributable to forms of social and cooperative housing represent 3% (1.1 million units) and 5% (1.9 million units) respectively. This last category, that of social housing, can be further subdivided by ownership: approximately 200,000 units are owned by cooperatives (18%), 400,000 by public real estate companies (36%), and 500,000 by other entities (45%) (Confindustria Assoimmobiliare, 2022).

A further distinctive element of the German market is the significant presence of institutional investors. According to the European Public Real Estate Association, approximately 43% of the German housing stock is owned by large commercial operators, including pension funds and insurance companies, while another 42% is held by small private landlords. Only 15% of the stock is occupied directly by the owners, highlighting a market strongly oriented towards rental and the presence of professional entities in real estate management (Battistini et al., 2018).



Figure 29: Comparison between the distribution of residential real estate stock (%) in Italy, France and Germany (2021).
 Source : Confindustria Assoimmobiliare, 2022

2.2.2.2 Housing Tenure: Ownership vs Renting

Analyzing the propensity to own a home in European countries, Eurostat data for 2021 show that Italy has a significant share of the population living in owner-occupied homes, equal to 73.7%, compared to a European average of 69.9%. Consequently, only 26.3% of Italians live in rented or free housing, a value lower than the European Union average, which stands at 30.1% (Agenzia delle Entrate & MEF, 2023).

The lowest rental rates (less than 10%) are found in Romania, Slovakia, Hungary, and Croatia, while values similar to the Italian ones are observed in Spain and Greece. On the contrary, countries such as France, Denmark, Austria, and Sweden have shares of individuals renting higher than the European average, with percentages above 35%. The case of Germany is particularly relevant, the only Member State in which the percentage of residents renting (51%) exceeds that of owners (49%) (Agenzia delle Entrate & MEF, 2023).

At the continental level, between 2010 and 2021 there was a slight increase in the share of the population living in rented accommodation, with a growth of 2.7% (from 29.3% to 30.1%). However, trends vary significantly between countries. In Germany, there was an increase of almost 8% in the rented population (from 46.8% to 50.5%), while in France and Italy, there was a reduction, respectively of 7% (from 38% to 35.3%) and 4% (from 27.4% to 26.3%) (Confindustria Assoimmobiliare, 2022).

In Italy, the share of families renting has decreased dramatically during the second half of the twentieth century. In 1951, according to census data, approximately 60% of Italian families lived in rented accommodation; this percentage fell to 32% in 1991, reflecting a strong cultural and political orientation towards home ownership, also supported by public policies to encourage purchase (Agenzia delle Entrate & MEF, 2023).

In the period 2010–2021, Italy maintained relative stability in the distribution between ownership and renting, with slight variations linked to economic and demographic dynamics (*Figure 30 & Figure 31*). In Germany, although renting remained prevalent, there was a moderate increase in real estate ownership. In France, on the other hand, there was an increase in the share of owners, favored by government measures aimed at facilitating access to housing (Confindustria Assoimmobiliare, 2022).

Distribuzione della popolazione in alloggi di proprietà (%)

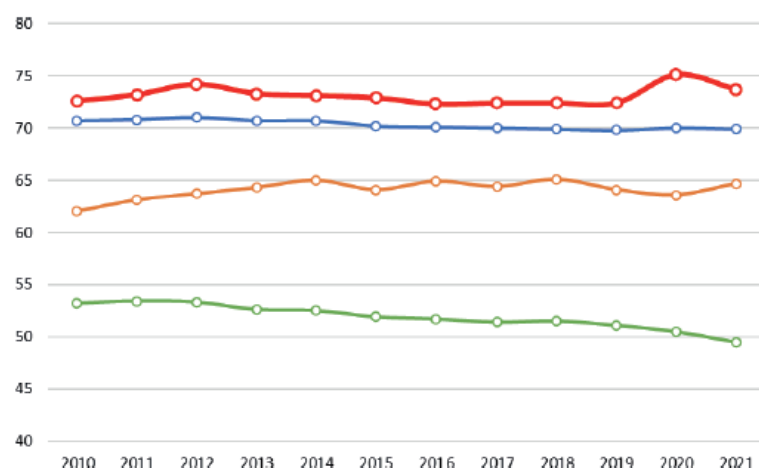


Figure 30: Distribution of the population (%) in owner-occupied housing. Source : Confindustria Assoimmobiliare, 2022

Distribuzione della popolazione in alloggi in affitto (%)

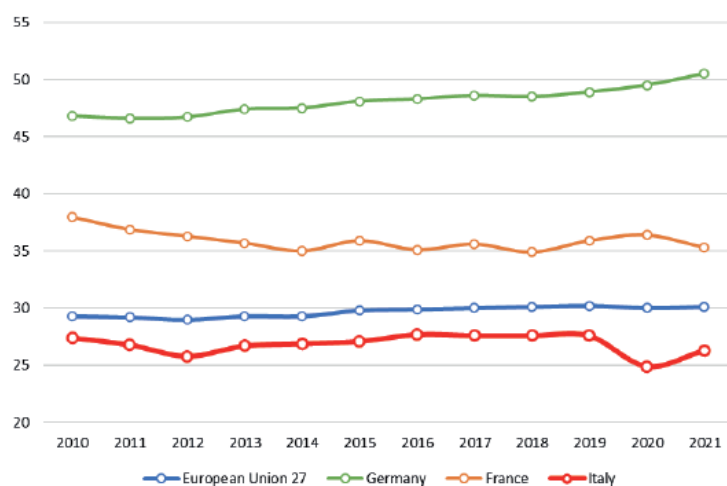


Figure 31: Distribution of the population (%) in rented housing. Source : Confindustria Assoimmobiliare, 2022

2.2.2.3 Housing Types: Dwellings Vs Apartments

At the European level, the distribution of the population by type of housing reflects marked differences linked to historical, urban planning, and cultural factors. According to Eurostat data, in 2021, 52.8% of the European Union population lived in single-family homes, while 46.3% lived in apartments and less than 1% in other forms of accommodation (such as houseboats, caravans, or campers). The prevalence of one or the other type varies significantly from country to country: in Ireland and the Netherlands, over 80% of the population lives in independent homes, while in Latvia, Estonia, Lithuania, and Spain this share drops below 40%, reflecting a predominance of condominium-type construction (Confindustria Assoimmobiliare, 2022).

In Germany, Italy, and France, the share of residents in apartments is 56.1%, 54.9%, and 33.6% respectively, compared to a significant percentage (over 35%) of the population living in cities with more than 50,000 inhabitants (*Figure 32 & Figure 33*). In particular, between 8% and 13% of the population of these countries lives in single-family homes in an urban context, while a share between 23% and 29% lives in apartments located in densely populated city areas (Confindustria Assoimmobiliare, 2022).

Distribuzione della popolazione in abitazione (%)

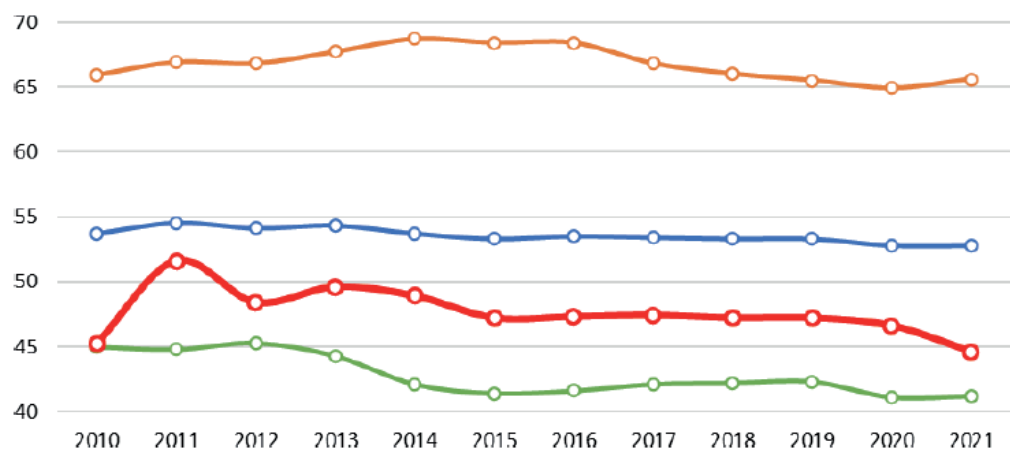


Figure 32: Distribution of the population (%) in housings. Source : Confindustria Assoimmobiliare, 2022

Distribuzione della popolazione in appartamento (%)

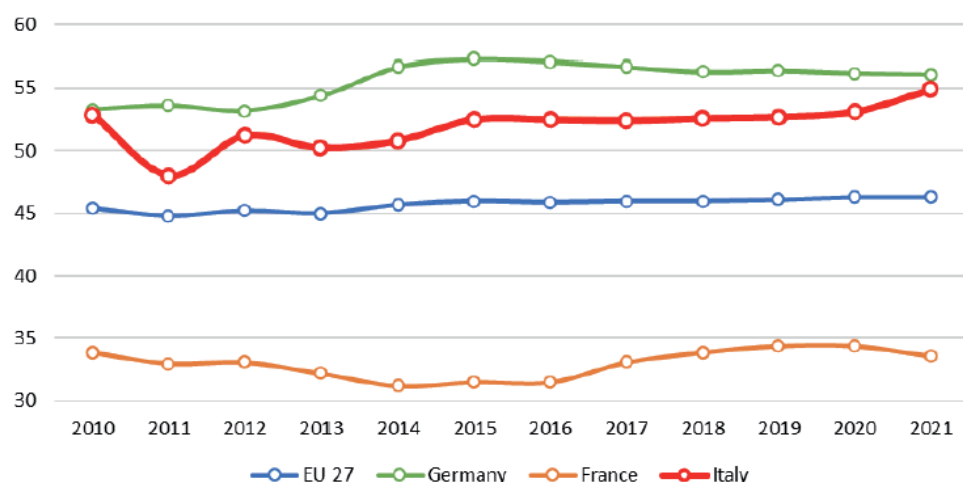


Figure 33: Distribution of the population (%) in apartments. Source : Confindustria Assoimmobiliare, 2022

A more in-depth analysis of the distribution of the population by building type highlights further national specificities.

According to Eurostat data for 2021 (Eurostat, 2025c), in Germany, around 40% of the population lives in apartments located in buildings with fewer than ten units, 25% in single-family homes (detached houses), while only a share of less than 20% lives in large condominium complexes with ten or more units. This distribution reflects the polycentric urban structure and the spread of small residential buildings, often intended for rental.

In France, on the other hand, almost 45% of the population lives in buildings with ten or more units, the result of a long tradition of social and public housing developed in urban centers. Only around 15% live in buildings with fewer than ten units, while the share of residents in single-family homes stands at around 20%, below the European average.

Italy has a more balanced distribution: about 30% of the population lives in small buildings (less than ten units), another 30% in large condominiums, and 25% in single-family homes (*Figure 34*). This configuration reflects the historical heterogeneity of the Italian building fabric, characterized by a coexistence of low and medium-density buildings, developed independently during the post-war economic boom, alongside historic urban centers, often made up of small multi-family buildings. Overall, the distribution of housing types in Europe is strongly influenced by urban development models, housing policies implemented over the decades, and local building traditions. The choice between a single-family home and an apartment is not just a matter of individual preference but reflects historical dynamics, land availability, urban density, and the structure of the real estate market.

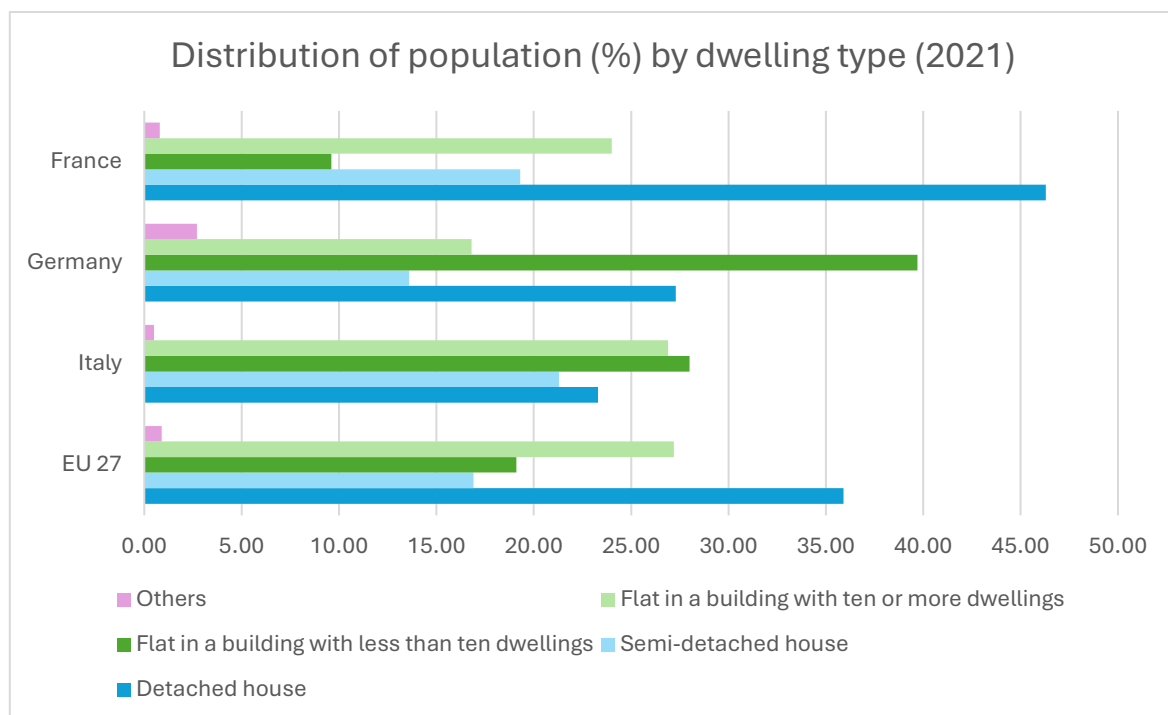


Figure 34: Distribution of the population (%) by dwelling type (2021). Source: Own elaboration based on data from Eurostat (Eurostat, 2025c)

2.2.2.4 Building Age and Energy Efficiency

The age of the building stock is a key indicator for assessing the energy performance of residential buildings in Europe, as older buildings tend to be less energy efficient. The differences between

European countries, in terms of the age of the building stock and its performance, are significant and reflect different political choices, economic cycles, and urban development strategies.

Significant divergences emerge in the comparison between Germany and France (*Figure 35*): in Germany, approximately 51% of the residential surface area is represented by buildings built before 1970 (of which 21% were built before 1945 and 30% between 1945 and 1969). In France, however, this share stops at 32% (18% before 1945 and 14% between 1945 and 1969), highlighting an average more recent building stock. 61% of French buildings were built between 1970 and 2010, compared to 45% in Germany, a sign of more intense and concentrated construction activity over the last fifty years (Gevorgian et al., 2021).

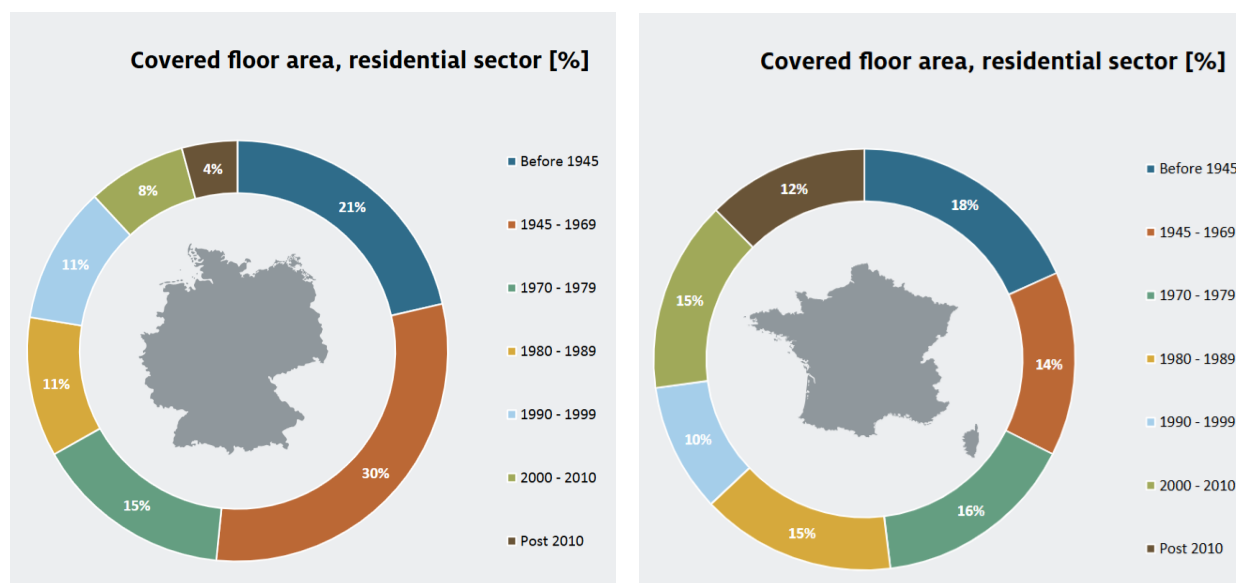


Figure 35: Covered floor area (%) by age of construction of residential building stock in Germany (a) and France (b). Source: Gevorgian et al., 2021

Italy, on the other hand, has a particularly dated building heritage: approximately 40% of homes were built between 1961 and 1980, and almost all of these buildings predate the entry into force of the first regulation on energy efficiency (Law no. 373/1976⁶). As a result, approximately 70% of Italian residential buildings are in the lowest energy classes (E, F, or G), highlighting a significant need for redevelopment (CRESME-Fondazione Symbola, 2024).

The correlation between the age of buildings and energy consumption is well documented: older buildings, lacking adequate thermal insulation and efficient systems, have a higher energy requirement. However, directly comparing energy performance between countries is complex, due to the different classification methodologies adopted at the national level. Italy uses the Global Energy Performance Index (EP_{gl}), Germany measures primary energy needs, while France uses a labeling system that also includes CO₂ emissions (CRESME-Fondazione Symbola, 2024).

At the European level, buildings account for around 43% of final energy consumption, with the residential sector accounting for two-thirds (Enerdata, 2021). This segment has a large untapped potential for energy savings, making it central to achieving the EU's climate goals. To address this challenge, the EU has developed a comprehensive regulatory framework based on targeted directives

⁶ Law no. 373/1976 introduced the first national requirements for energy performance in buildings in Italy, setting limits on thermal transmittance and mandating minimum insulation standards for new constructions and major renovations.

and strategies, including the *Energy Performance of Buildings Directive* (EPBD), the *Energy Efficiency Directive* (EED), and the *Renovation Wave Strategy*.

In 2019, the average energy consumption per dwelling in the EU was 1.3 tons of oil equivalent (toe) per dwelling (Figure 36). Despite a general downward trend since 2000 (-1.0% per year), in the period 2014–2019, different dynamics can be observed among countries: Italy accelerated the decline in consumption, France showed a stabilization, while Germany recorded a reversal of the trend, with an increase in unit consumption per dwelling (Enerdata, 2021). These variations are influenced not only by the average energy efficiency of buildings but also by climatic factors, consumption behaviors, and average size of dwellings.

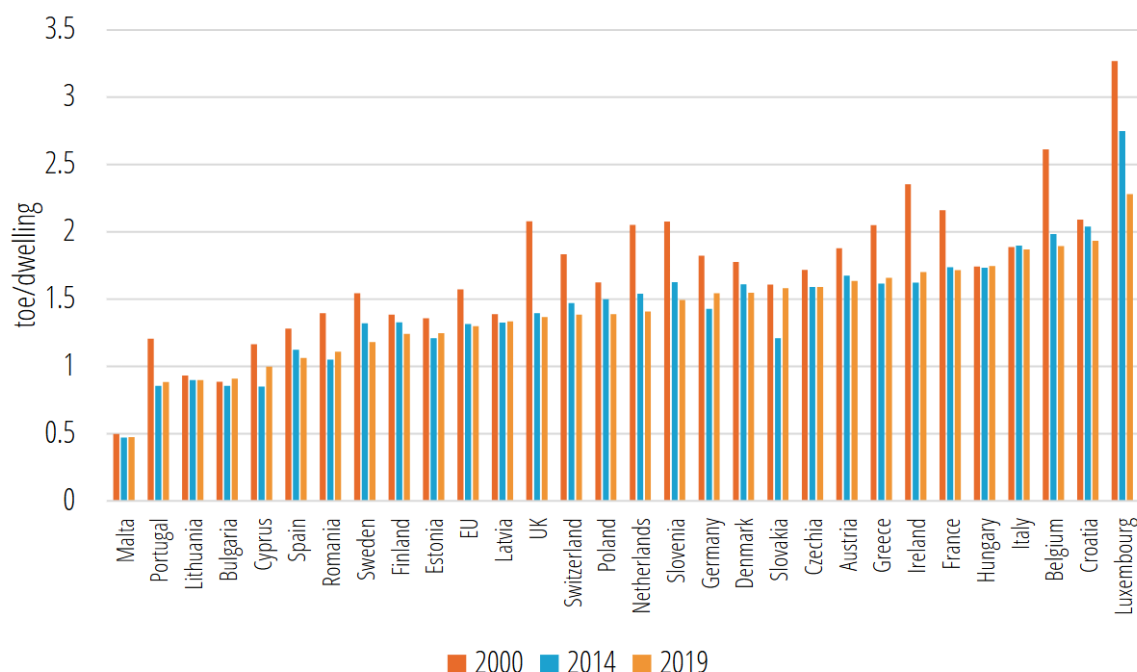


Figure 36: Energy consumption per dwelling (toe/dwelling), scaled to the EU average climate. Source: Enerdata, 2021

In light of these differences, the need for each country to define energy upgrading strategies calibrated not only to the age of the building stock but also to the actual performance of buildings and housing demand seems clear. Italy, in particular, faces greater challenges due to the high age of its building stock and the prevalence of energy-intensive buildings. In this context, harmonization of energy rating criteria at the European level would be a key step to more effectively monitor progress and plan targeted and comparable policies.

2.2.2.5 Urban Vs Rural Housing Patterns

The distribution of population between smaller urban centers and rural areas shows significant heterogeneity among major European countries (Confindustria Assoimmobiliare, 2022). In Germany and Italy, more than 40% of residents live in urban centers with fewer than 50,000 inhabitants, while in France this share falls below 30%. Similarly, rural areas are home to less than 20% of the population in Germany and Italy, compared with a share of more than 30% in France.

Analyzing the typological and locational evolution of the European population over the past decade, we observe a slight contraction (-1.7%) in the share of residents in independent dwellings and a concomitant increase (+2%) in those living in apartments. This change is driven by two opposite trends: a sharp decline in the population living in dwellings in large urban areas (-22.7%) and a significant increase (+62.9%) in the population living in apartments in smaller urban centers.

In detail (Figure 37), France and Germany recorded significant growth in the population living in dwellings located in rural areas: +87.2% and +35.5%, respectively. In Italy, on the other hand, there was a 26% decline in cities, partially offset by a 5% increase in smaller urban centers and an 11.4% increase in rural areas.

As for apartments, all three countries show a decline in the share of residents in urban areas, ranging from -12% to -15% (Figure 38). In contrast, important increases are shown in less urbanized areas: in France, +50.9% in smaller urban centers and +111% in rural areas. Germany and Italy, on the other hand, show more moderate but similar dynamics, with an increase in apartment population in smaller urban centers of 40.7% in Germany and 32.7% in Italy, and an increase of 26.4% and 13% in rural areas, respectively.

Distribuzione della popolazione in abitazione per livello di urbanizzazione (%)

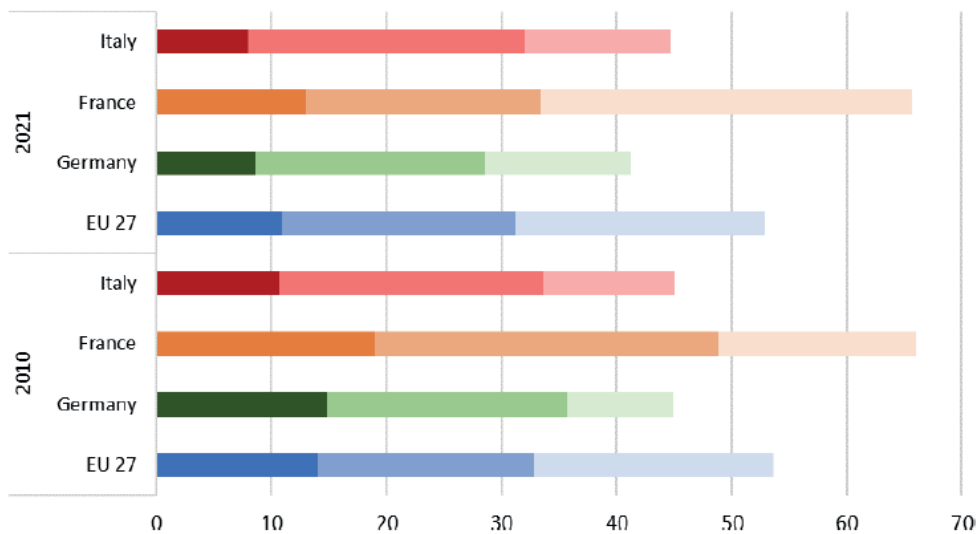


Figure 37: Distribution of the population in housing by level of urbanization %. Source : Confindustria Assoimmobiliare, 2022

Distribuzione della popolazione in appartamento per livello di urbanizzazione (%)

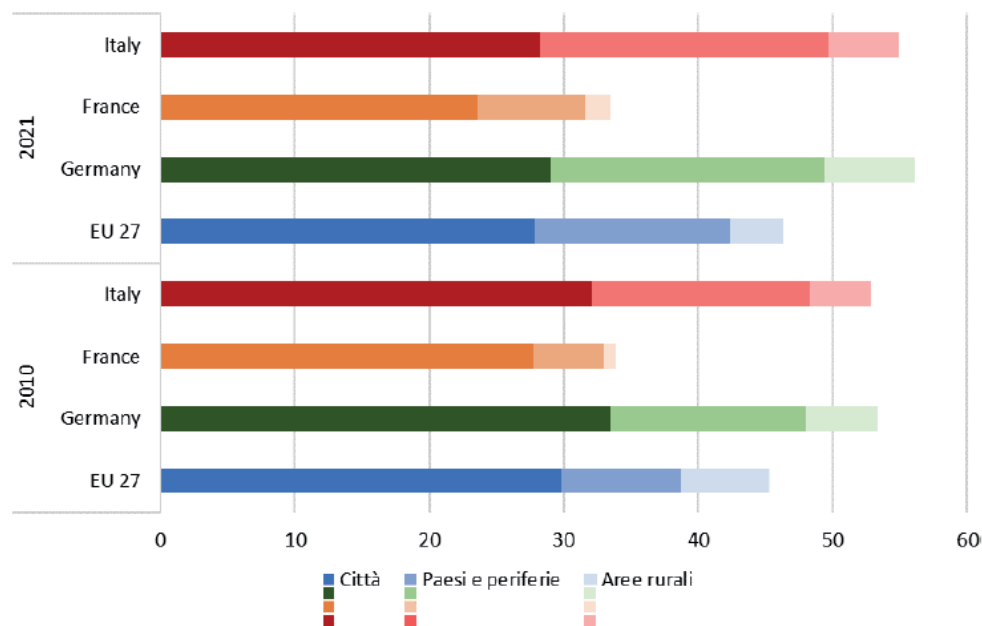


Figure 38: Distribution of the population in apartments by level of urbanization %. Source : Confindustria Assoimmobiliare, 2022

2.2.2.6 Housing Size, Overcrowding and Under-Occupancy

Also according to the Assoimmobiliare report (Confindustria Assoimmobiliare, 2022), in Europe, the average size of housing is 1.6 rooms per person. Some countries, such as the Netherlands, Ireland, Belgium, and Malta, exceed 2 rooms per person, while others, such as Poland and Romania, are just above the threshold of 1 room per person. Germany and France rank above the European average, with 1.8 rooms per person, while Italy ranks slightly below, with a ratio of 1.4 rooms per person.

Over the past decade, these ratios have remained stable, with no significant change from the figures recorded in 2020. However, a more detailed analysis by housing type and tenure reveals greater heterogeneity across countries. In France, for example, dwellings average 2 rooms per person (1.9 in 2010), while apartments remain stable at 1.5. In Germany, similar values are observed, but apartments are slightly larger, averaging 1.6 rooms per person. In Italy, dwellings maintain a ratio of 1.5 rooms per person, falling to 1.3 for apartments.

In the Italian context, out of a total of 32.85 million housing units, about 56% (or nearly 18.4 million) have an area of less than 100 m². The most represented size range is between 80 and 100 m² (24%, about 7.9 million housing units), followed by between 60 and 80 m² (20%, about 6.6 million) and between 100 and 120 m² (19%, about 6.2 million).

The differences become more pronounced when considering tenure. In France and Germany, owner-occupied homes have an average of 2 rooms per person, while owner-occupied apartments record 1.8 and 1.9 rooms, respectively. In Italy, on the other hand, owned apartments have an average of 1.4 rooms per person, compared to 1.5 for dwellings.

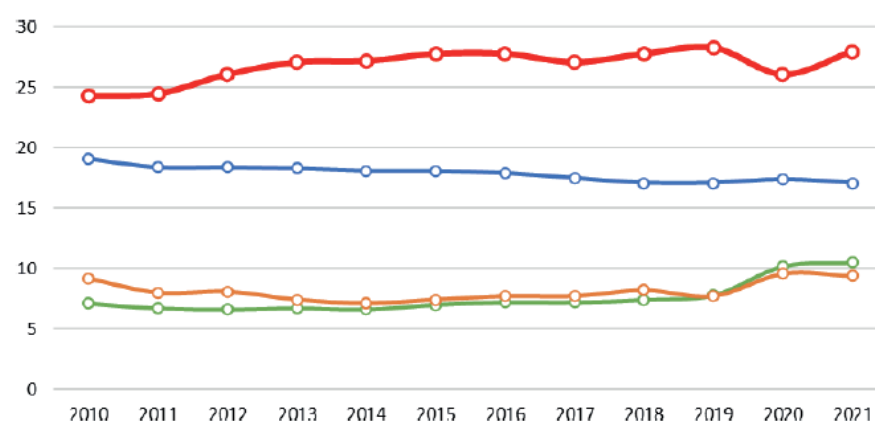
Rental housing is generally smaller, with Italy recording an average of 1.3 rooms per person, compared to 1.6 in France and 1.7 in Germany. Rental apartments are even smaller, with 1.1 rooms per person in Italy, 1.4 in France, and 1.5 in Germany. More than half of Italy's approximately 4.6 million rented households live in dwellings with a floor area of less than 80 m², built mostly before 1970.

Directly linked to housing size are the phenomena of overcrowding and housing underoccupancy, both of which were considered critical factors even before the COVID-19 pandemic. At the European level, 17.1% of the population lived in overcrowded conditions in 2021, down from 19.1% in 2010 (-10.5%). In contrast, the share of the population living in under-occupied housing increased from 32.7% to 33.6% (+2.8%).

The highest rates of overcrowding are found in Latvia and Romania (over 40%), while the lowest levels are found in Cyprus and Malta (less than 3%). Among the three countries surveyed, Italy has the highest figure, with 28% of the population in overcrowded conditions in 2021, up 15.2% from 2010 (Figure 39). It is followed by Germany with 10.5% (+47.9%) and France with 9.4% (+2.2%).

Regarding housing underoccupancy, the highest values are in Malta and Cyprus (over 70%), while the lowest are in Latvia and Romania (below 10%). Among France, Germany, and Italy, France shows the highest rate of the population living in under-occupied housing (42.8%, +2% from 2010), followed by Germany (34.5%, -5%) and Italy (15.4%, -18.9%) (Figure 39).

Distribuzione della popolazione in alloggi sovraffollati (%)



Distribuzione della popolazione in alloggi sottoccupati (%)

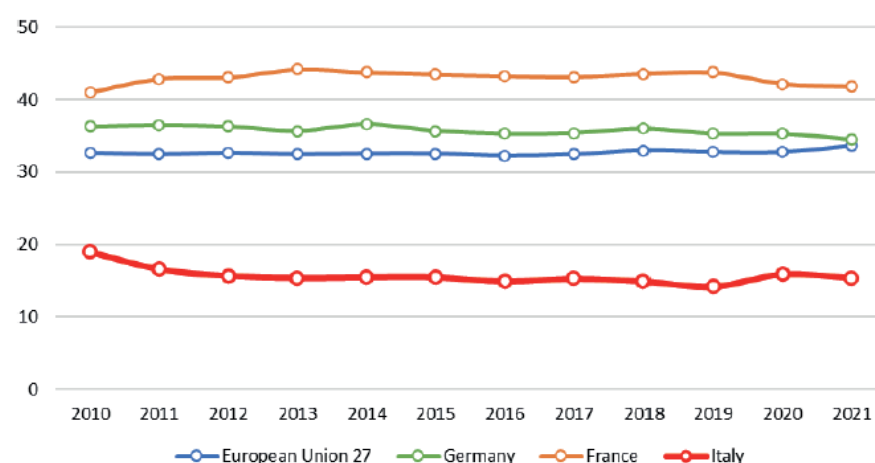


Figure 39: Distribution of the population in overcrowded (a) and under-occupied (b) housing %. Source : Confindustria Assoimmobiliare, 2022

2.2.2.7 Trends in Housing Prices and Rents

The analysis of the evolution of housing prices and rents in the EU shows a markedly upward trend since 2015, affecting most member states, albeit with significant differences between countries. According to the latest report by the Agenzie delle Entrate in collaboration with the MEF entitled “Le locazioni delle abitazioni” (Agenzia delle Entrate & MEF, 2023), between 2010 and 2021, the sale price of real estate increased by an average of 37%, while rents grew by 16%. This gap reflects a dynamic in which the purchase of real estate has also become increasingly central as a form of investment as well as a housing need.

In contrast to the European average, Italy recorded a 13% decrease in sales prices over the same period, while rents increased by 6.5%. This trend highlights a structural stagnation in the Italian real estate market, likely related to weak economic growth, the limited spending capacity of households, and a reduced attractiveness of “bricks and mortar” as a safe haven or investment asset.

Construction costs have also affected price trends. In the EU, these costs rose by 25% between 2010 and 2021, with a sharp acceleration starting in 2016. In Italy, however, the increase was limited to just

over 9%, indicating a more subdued pressure on costs, which has not, however, translated into a market recovery.

A relevant indicator for measuring housing affordability is the share of disposable income allocated to housing. In 2021, this incidence was 18.9% in the EU and 15.8% in Italy. However, for low-income groups (income below 60% of the national median), housing pressure was much higher at 37.7% of income, compared to 15.2% for higher incomes. This scenario shows a clear inequality in access to housing.

Looking at the most recent period (2015-2023), housing prices in the EU increased by an average of 48%, showing a strong acceleration from the previous decade (*Figure 40*). Again, Italy stands out with a much lower growth rate of 8.3%, confirming a stagnating trend compared to other countries such as France and Germany (Rising Housing Costs in the EU, 2024).

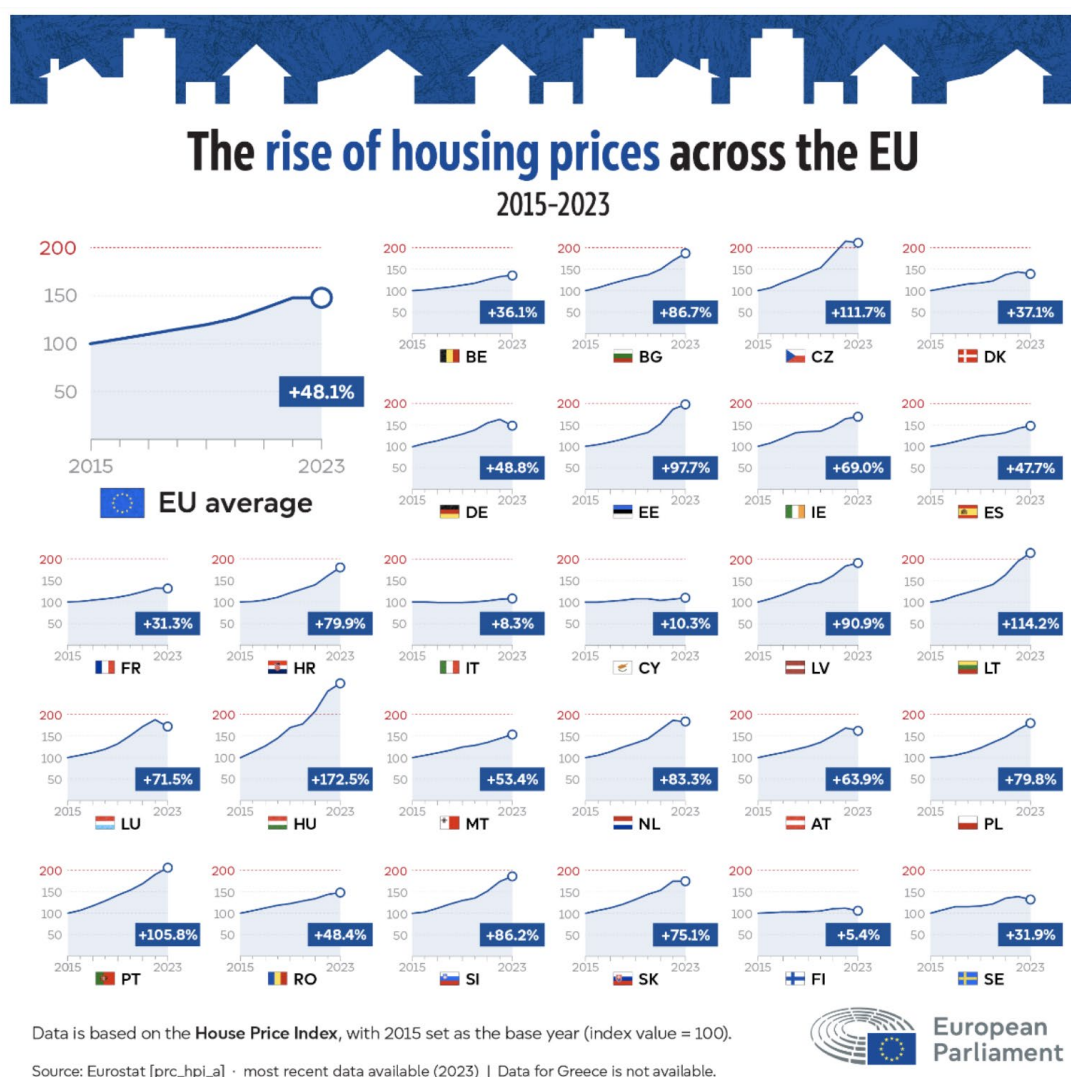


Figure 40: % increase in housing across Eu countries from 2015 to 2023. Source: Rising Housing Costs in the EU, 2024

The main causes of price increases at the European level include: rising construction costs and mortgage rates, the decrease in construction activity, resulting in reduced housing supply, and the growing demand for real estate for investment purposes, including speculation.

In parallel, rents have also shown a gradual increase: between 2010 and 2023, they grew by an average of 22% in the EU. Factors affecting this dynamic include the spread of short-term rentals (e.g., tourism), which has reduced the availability of housing in the traditional residential market. In Italy, although with

smaller absolute values, there has been an increase of +3.7% between 2021 and 2023, showing a recent acceleration while maintaining one of the most stable dynamics in Europe (Rising Housing Costs in the EU, 2024).

Analysis of Eurostat data (Eurostat, 2025b) confirms a differentiated evolution between the markets of France, Germany, and Italy (Figure 41a & Figure 41b). In France, there was an increase in sales prices to an index of about 132 (base 2015=100), with rents growing more moderately, just over 105. The market shows sustained but relatively balanced dynamics. Germany, on the other hand, experienced a significant surge in sales prices, with a peak above 160 in 2022 and a slight correction thereafter. Rents have also risen steadily, surpassing the 110 index in 2023. This trend reflects strong housing demand, particularly in urban areas, also influenced by speculative phenomena. Italy, on the contrary, recorded stagnant trends in both sectors. Sales prices have grown only marginally, while rents have remained among the most stable in Europe. This situation is attributable to structural criticalities, including an aging housing stock, reduced household investment capacity, low attractiveness for foreign capital, and weak domestic demand.

In conclusion, the dynamics of real estate prices in Europe have been influenced by macroeconomic factors-including housing inflation, imbalances between supply and demand, and monetary policies but the intensity and direction of the changes vary significantly among countries. While Germany and France have experienced strong market expansion, thanks in part to active housing policies and substantial internal migration flows, Italy is showing signs of a structural slowdown, with significant consequences in terms of affordability and attractiveness of the residential market.

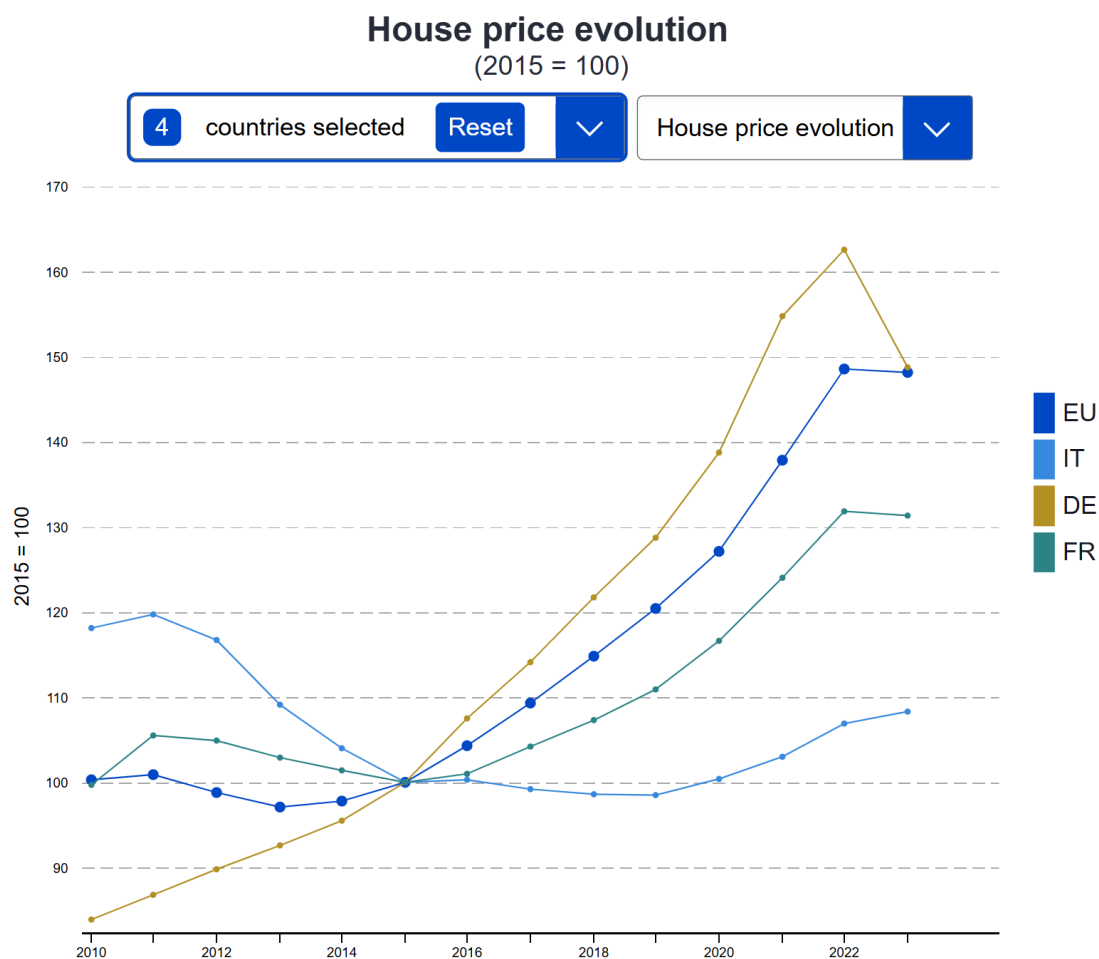


Figure 41a: Evolution of the house price. Source: Eurostat, 2025b

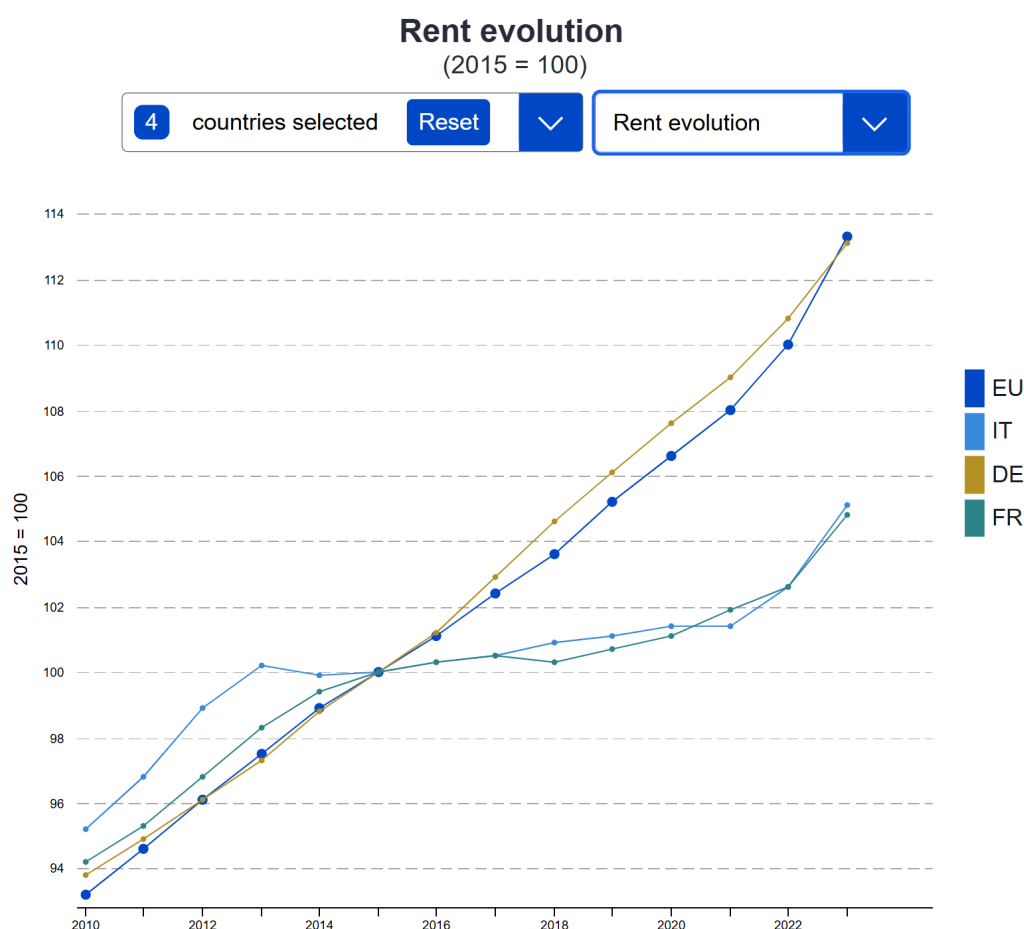


Figure 42b: Evolution of the house rent. Source: Eurostat, 2025b

It is important to notice that, beyond macroeconomic factors, differences in housing price and rent dynamics across European countries are also shaped by the profiles of the main residential investors and owners. In Italy, high owner-occupation rates, a small and declining share of social housing and the predominance of small private landlords imply that most investment decisions are fragmented and strongly path-dependent, with limited scope for large-scale, coordinated interventions on the housing stock (OECD/Triennale de Milan, 2023). The result is that new residential construction is largely driven by private developers, cooperatives and small-scale investors, while the public sector is mainly involved through social housing programmes and co-funded regeneration schemes, often implemented via public–private partnerships and real estate funds that mobilize institutional and non-profit investors.

In several Northern and Western European countries, by contrast, public and non-profit housing providers play a more prominent role and institutional investors have become increasingly active in rental markets, especially in major cities and in segments such as multifamily, student housing and senior living (European Commission, 2025b). This growing institutional footprint can support new construction and professional management, but it may also contribute to faster house price growth and rent increases, weakening the traditional link between local incomes and housing costs in the most attractive urban areas (Bandoni et al., 2025).

Against this backdrop, the Italian residential market remains characterized by a strong prevalence of individual ownership. This configuration tends to amplify the organizational and financial challenges associated with renovation and innovation, while at the same time limiting the capacity of institutional investors to drive large-scale upgrading of the housing stock. These structural features help explain why price and rent dynamics in Italy differ from those observed in more financialized housing markets.

2.2.2.8 Socio-Demographic Trends and Their Housing Impact

- Demographic Trends

Analysis of demographic trends at the European level shows trends similar to those found in the Italian context. One of the most relevant phenomena is population aging, a long-term trend that began several decades ago in Europe. This phenomenon is driven by a persistent decline in birth rates and a steady increase in life expectancy. This results in major changes in the age structure of the population, with an increase in the share of older people and a consequent decline in the working-age population (Eurostat, 2025d). This demographic transformation results in a gradual but marked transition to an older population, a phenomenon already evident not only in Italy but also in several other European Union countries (*Figure 42*).

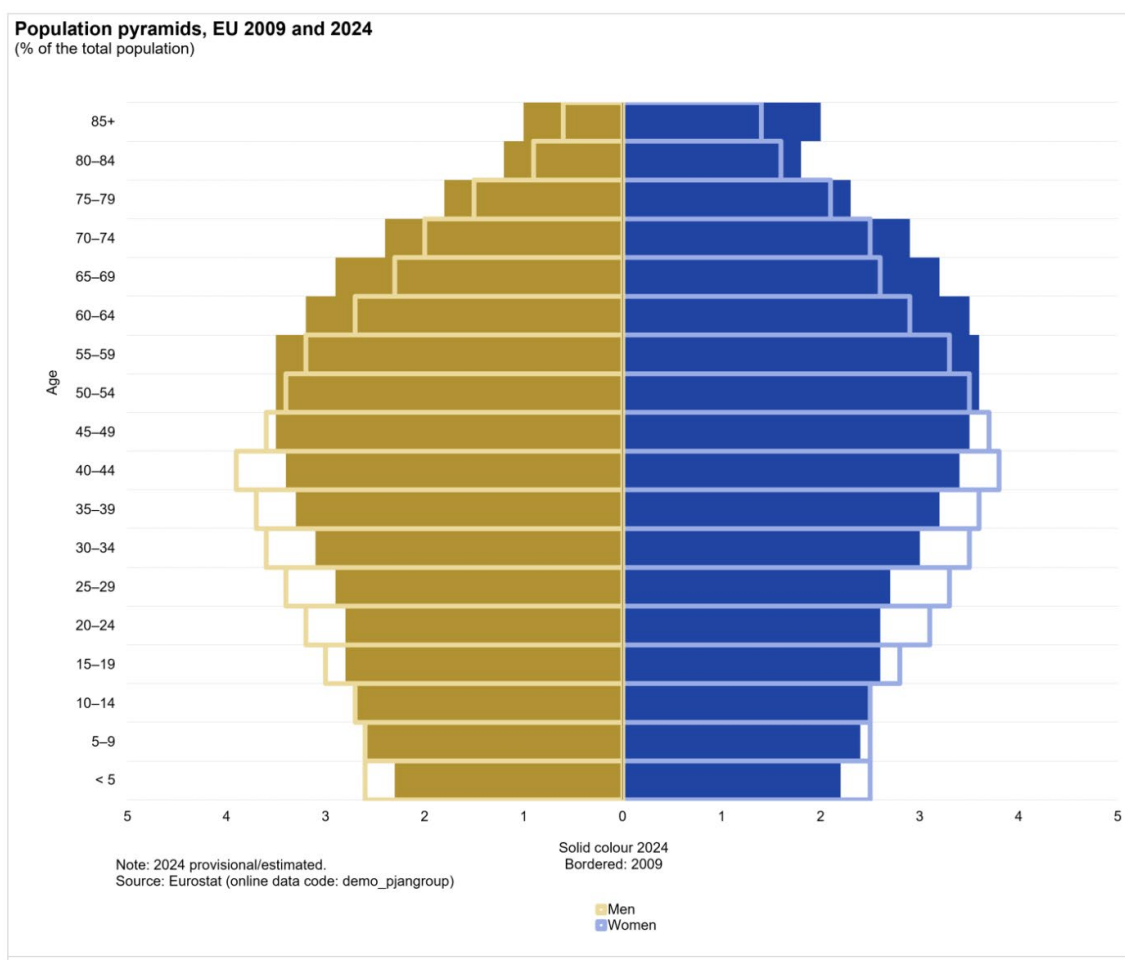


Figure 43: Population pyramid (% of population), EU 2009 and 2024. Source: Eurostat, 2025d

The effect of this change is twofold: on the one hand, there is a reduction in the share of the working population; on the other hand, there is a significant increase in the proportion of people of retirement age. This demographic imbalance will have major implications in several areas, including health and social welfare systems, labor markets, public finance, and pension systems (Eurostat, 2020).

As of January 1, 2024, the population of the European Union was estimated at about 449.3 million. Children (0-14 years) accounted for 14.6% of the population, while the working-age group (15-64 years) made up 63.8% (*Figure 43*). The share of people aged 65 or older was 21.6%, an increase of 2.9% points from 10 years earlier (Eurostat, 2025d).

Analyzing the three countries under study in detail, in 2024 France had the highest share of children (17.0%), while Italy had the lowest share (12.2%). As for the elderly, Italy remained the country with the highest incidence (24.3%), followed by Germany, while France had a lower share (21.4%). Over the past year, the share of the elderly has decreased in only one of the EU member states, while in the others it has increased.

Population age structure by major age groups, 2014, 2023 and 2024
(% of the total population)

	0–14 years old			15–64 years old			65 years old or over		
	2014	2023	2024	2014	2023	2024	2014	2023	2024
EU (*)	15.3	14.8	14.6	66.0	63.8	63.8	18.7	21.3	21.6
Belgium	17.0	16.5	16.3	65.2	63.8	63.8	17.8	19.7	19.9
Bulgaria	13.9	14.2	14.1	66.2	62.3	62.1	19.9	23.5	23.8
Czechia	15.0	16.2	15.9	67.6	63.4	63.6	17.4	20.4	20.5
Denmark	17.2	16.0	15.7	64.5	63.6	63.6	18.2	20.5	20.7
Germany	13.2	14.0	13.9	66.0	63.8	63.6	20.9	22.2	22.4
Estonia	15.8	16.4	16.0	65.8	63.4	63.5	18.4	20.2	20.5
Ireland	21.5	19.3	18.9	65.9	65.5	65.6	12.6	15.2	15.5
Greece	14.6	13.4	13.1	64.9	63.7	63.6	20.5	23.0	23.3
Spain	15.2	13.6	13.2	66.7	66.3	66.4	18.1	20.1	20.4
France (*)	18.6	17.2	17.0	63.4	61.7	61.6	18.0	21.1	21.4
Croatia	14.8	14.3	14.0	66.7	63.0	62.9	18.5	22.7	23.0
Italy	13.9	12.4	12.2	64.6	63.5	63.5	21.5	24.0	24.3
Cyprus	16.3	15.4	15.3	69.9	67.2	67.0	13.9	17.3	17.7
Latvia	14.7	16.0	15.6	66.2	63.1	63.0	19.1	21.0	21.3
Lithuania	14.6	14.9	14.5	67.1	65.0	65.1	18.4	20.0	20.3
Luxembourg	16.8	15.9	15.7	69.1	69.3	69.2	14.1	14.9	15.0
Hungary	14.4	14.5	14.5	68.1	65.0	64.9	17.5	20.5	20.7
Malta	14.5	12.7	12.3	67.8	68.7	69.3	17.6	18.6	18.4
Netherlands	16.9	15.3	15.1	65.7	64.5	64.4	17.3	20.2	20.5
Austria	14.3	14.4	14.4	67.4	66.0	65.8	18.3	19.6	19.8
Poland (*)	15.0	15.4	15.1	70.1	64.7	64.4	14.9	19.9	20.5
Portugal	14.7	12.9	12.8	65.4	63.2	63.1	20.0	23.9	24.1
Romania (*)	15.5	16.1	15.9	68.0	64.2	64.1	16.5	19.7	20.0
Slovenia	14.6	15.0	14.7	67.9	63.6	63.5	17.5	21.4	21.8
Slovakia	15.3	16.1	16.0	71.1	66.1	65.7	13.5	17.9	18.4
Finland	16.4	15.1	14.9	64.2	61.6	61.8	19.4	23.3	23.4
Sweden	17.1	17.4	17.1	63.5	62.2	62.3	19.4	20.4	20.6
Iceland	20.5	18.2	18.3	66.3	66.8	66.2	13.2	15.0	15.6
Liechtenstein	15.2	14.5	14.4	69.2	65.9	65.4	15.5	19.6	20.3
Norway	18.2	16.7	16.4	65.9	64.9	64.9	15.9	18.4	18.7
Switzerland	14.9	15.1	15.0	67.5	65.8	65.7	17.6	19.2	19.3
Montenegro	18.6	17.9	18.2	68.1	65.7	65.1	13.3	16.4	16.7
Moldova	16.0	18.0	17.5	74.0	65.9	65.1	10.0	16.1	17.4
North Macedonia	16.9	16.8	16.8	70.8	65.5	65.5	12.4	17.7	17.7
Georgia	17.1	20.7	19.5	68.9	63.8	64.3	14.0	15.6	16.2
Albania	19.6	16.0	16.0	68.4	67.5	67.5	12.0	16.5	16.5
Serbia	14.3	14.4	14.4	67.6	63.4	63.1	18.0	22.1	22.4
Türkiye	24.6	22.0	21.4	67.7	68.1	68.3	7.7	9.9	10.2
Ukraine	14.8	14.8	14.8	69.9	69.9	69.9	15.3	15.3	15.3

(*) 2024 provisional/estimated.
Source: Eurostat (online data code: demo_pjanind)

eurostat

Figure 44: Population age structure by major age groups, 2014, 2023 and 2024 (% of population). Source: Eurostat, 2025d

Another relevant indicator is the median age of the population, which on January 1, 2024, was 44.7 years for the entire EU (Figure 44). This means that half of the European population is over 44.7 years old, and the other half is less. The differences between countries are marked: Italy has the highest median age (48.7 years), while Ireland has the lowest (39.4 years). The EU median age increased by 2.2 years from 2014 to 2024, an average annual increase of 0.22 years. In Italy, the increase was 4 years, while Germany saw a slight decrease, from 45.6 to 45.5 years (Eurostat, 2025d).

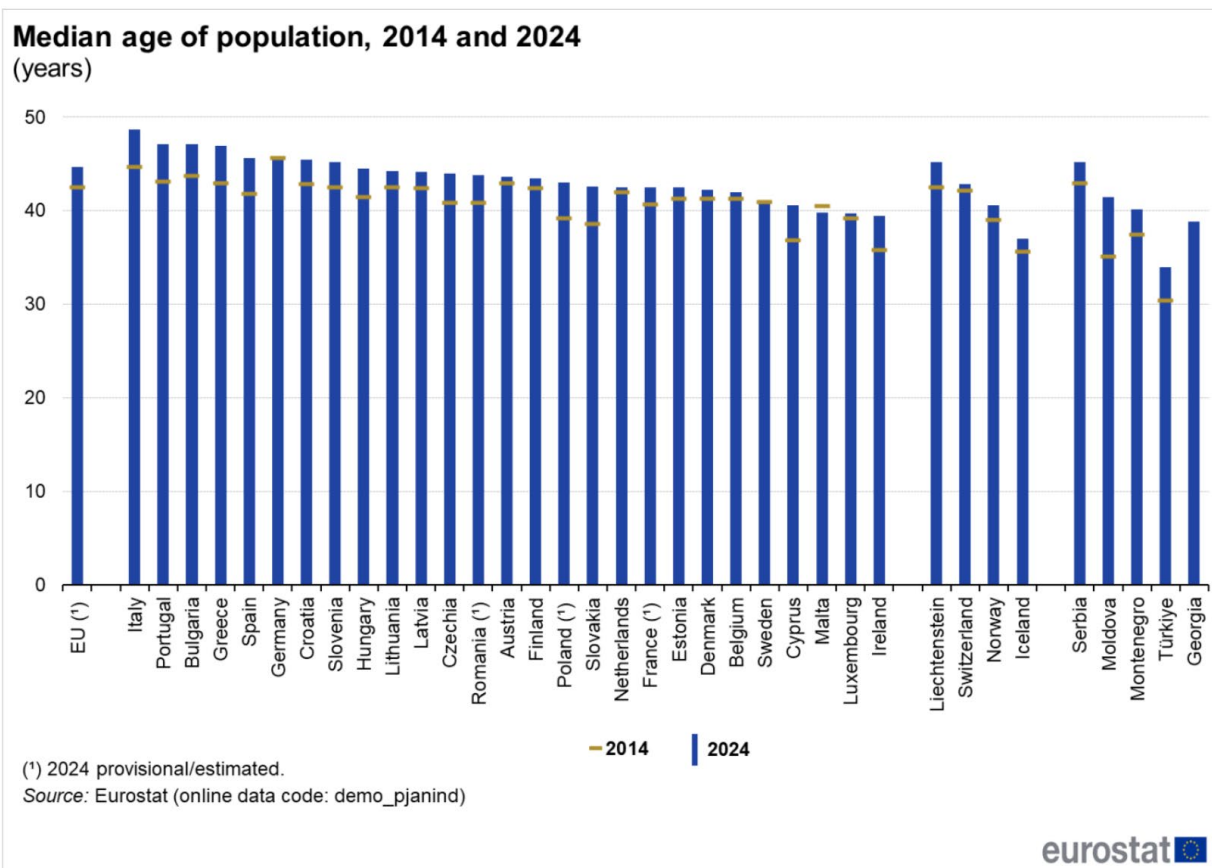


Figure 45: Median age of population, 2014 and 2024 (years). Source: Eurostat, 2025d

- Composition of the Family Unit

In addition to the age structure, changes in household composition further reflect ongoing sociodemographic transformations. In 2023, the EU had about 200 million households. Among them, single-person households without children were the most common (73.4 million), followed by childless couples (48.4 million), other single-person households without children (30.6 million), and couples with children (30.3 million). As for families with children, one-child families are the most prevalent: in 2023, 48.9% of families with children in the EU had one child, followed by 38.2% with two children and 12.9% with three or more children. Italy shows a particularly high share of families with one child and a lower incidence of families with three or more children, while France and Germany show values more in line with the EU average (Figure 45).

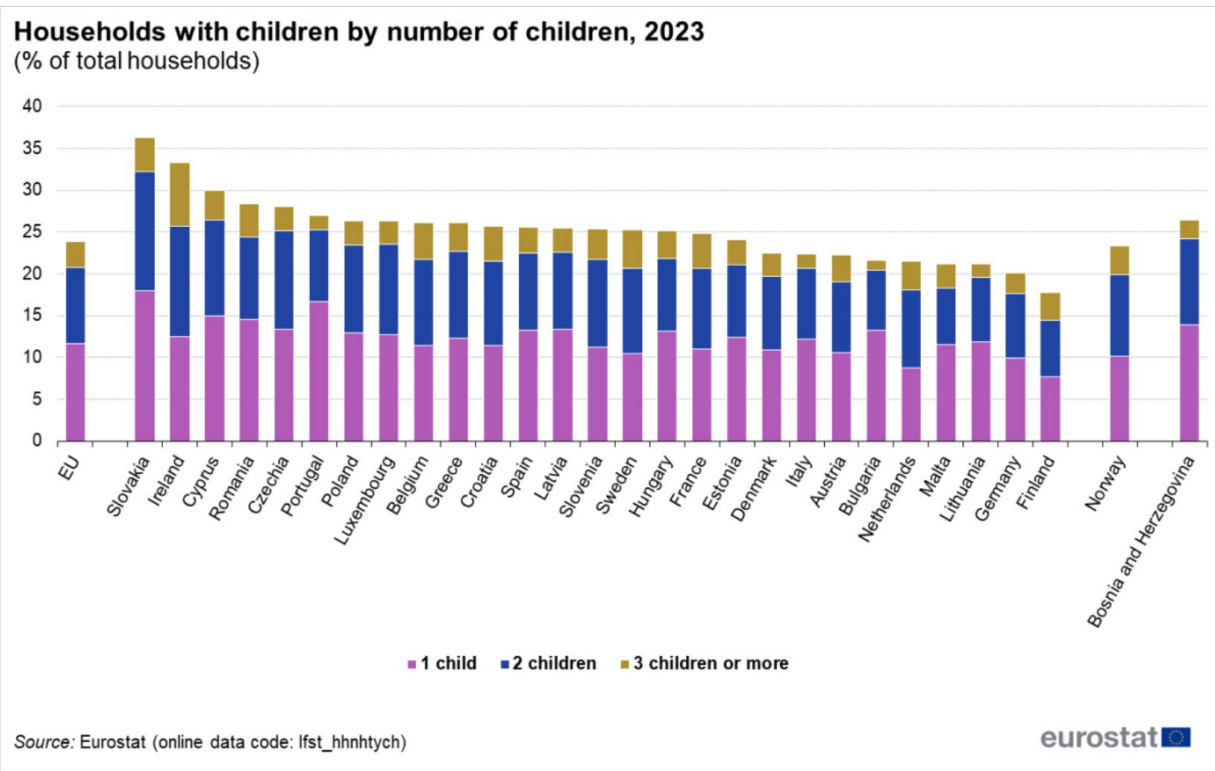


Figure 46: Households with children by number of children, 2023. Source: Eurostat, 2025a

Between 2013 and 2022, the total number of households in the EU increased by 7.0% (Figure 46). In particular, single-person households grew by 21.0%, confirming the trend toward individualization. In contrast, couples with children decreased by 3.7%, and households with multiple adults not forming a couple also decreased, particularly those with children (-6.1%) (Eurostat, 2025a).

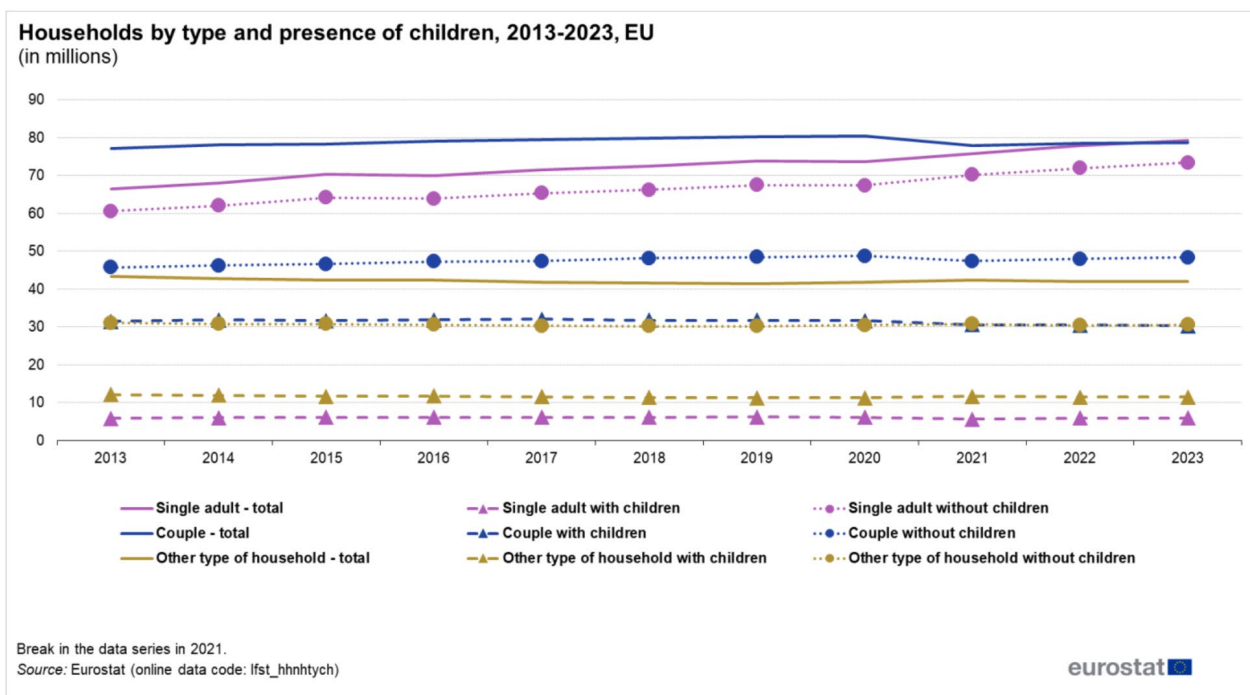


Figure 47: Households by type and presence of children, 2013 - 2023, EU. Source: Eurostat, 2025a

This development is strongly related to age and lifestyle. More than 20% of the adult population lives alone or as a single parent, and this percentage increases with age. For example, while only about 10% of young adults (18-24 years old) live alone, this percentage rises to about 33% for people aged 65 and older. Between 2013 and 2023, the number of single adults increased in all age groups, with a 13% increase for those aged 18-54 and a 23% increase for those older than 54 (Eurostat, 2025a).

Another significant variable is the average age at which young people leave their parental home (*Figure 47*). In 2023, the EU average was 26.3 years, but values vary widely from country to country, from 21.4 years in Finland to 31.8 years in Croatia. In Italy, the average was close to 30 years, among the highest in the EU, largely due to cultural habits, economic uncertainty, and high housing costs. In contrast, France and Germany show lower averages, indicating smoother transitions to residential independence (Eurostat, 2024).

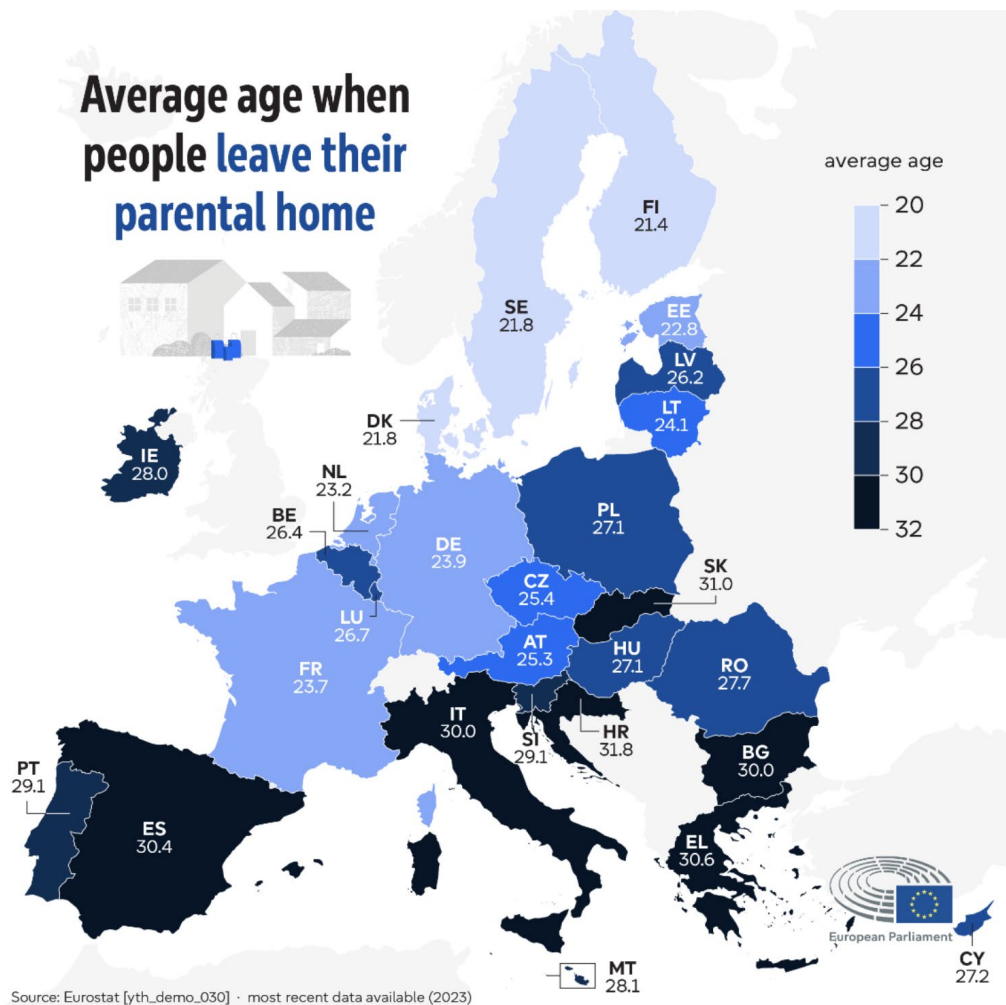


Figure 48: A map of the average age at which people leave their parental home in EU countries. Source: *Rising Housing Costs in the EU, 2024*

2.2.2.9 European Comparison: Key Insights

Analysis of the European data reveals marked heterogeneity between countries, but also some common trends, both from the real estate point of view and about economic, objective, and subjective aspects related to living (size, types, title of enjoyment of the dwelling - ownership or renting). The prevailing pattern of ownership is individual ownership, with a clear majority of households living in owned homes, although renting is more common in Western and Nordic European countries. Housing type varies: detached houses dominate in rural areas, while apartments are more common in urban centers. The European building stock is on average dated, with more than 40% of buildings constructed

before 1970 and with poor energy performance. At the socio-demographic level, Europe faces a rapidly aging population, the spread of smaller households, and an increase in singles. Phenomena such as overcrowding persist in some areas, while in others there is under-occupancy of housing. Finally, purchase and rental prices have risen significantly over the past decade, especially in urban areas, fueling critical issues related to housing affordability.

In conclusion, in the study conducted, the Italian residential sector emerges as a context in which structural characteristics and broader transformation pressures converge, generating implications that contribute to making residential sector more complex, less coordinated, and more difficult to adapt to changing needs. The comparison with other European contexts helps clarify that these issues are not only the result of general housing trends, but are also shaped by specific national conditions and they influence not only the physical quality of the housing stock, but also the organizational capacity through which buildings and services are managed over time and the relations among actors that influence the experience and the quality of dwelling.

For this reason, the main implication of the analysis developed in this chapter is that the residential question cannot be interpreted exclusively in terms of units, age, tenure, energy performance or market trend. On this basis, the following section moves from the structural reading of the residential sector toward a more interpretative perspective, aimed at understanding housing as an evolving system of functions, services, and stakeholder interactions.

This shift in perspective becomes particularly relevant in relation to the condominium context, where fragmentation, interdependence, and collective decision-making are especially visible. In this sense, many of the criticalities observed at the macro level already anticipate the conditions that, at the micro level, make the condominium a particularly significant and problematic residential context.

2.3 Redefining Housing: From Physical Space to Service-Oriented and User-Centric Models

While the previous chapters outlined the context in which the current transformation of the residential sector is taking place, the present section explores how housing can be increasingly interpreted not only as a physical asset, but a complex and dynamic entity embedded within an evolving socio-economic system. The increasing demand for flexibility, personalization, and adaptability has led to the emergence of alternative forms of living capable of addressing users' changing needs.

By shifting the focus from housing stock to housing experience and service-oriented system, this section provides a conceptual bridge between the quantitative analysis of the Italian residential market developed in the previous chapter “2.2 *Residential Sector Evolution: National Trends and European Comparison*” and the subsequent examination of service-oriented and user-centric residential models.

Specifically, the chapter explores how housing is being redefined, in which residential functions are increasingly complemented by a wide range of services and forms of collective organization. Particular attention is given to the emergence of user-centric residential models and to the increasing complexity of managing multiple services, actors, and interactions within contemporary living environments. Within this framework, the concept of Housing as a Service (HaaS) is introduced as a lens through which the ongoing transformation can be interpreted as well as the implications that this model can bring.

This perspective is essential to frame the discussion on new residential concepts and, ultimately, to contextualize the condominium as a potentially fragmented ecosystem in which the organization of services, interactions among actors, and coordination mechanisms play a central role in shaping everyday residential life.

2.3.1 From Housing Stock to Housing Experience and Service-Oriented System

The analysis developed in Chapter “2.2 *Residential Sector Evolution: National Trends and European Comparison*” highlighted how the Italian residential market is characterized by a predominantly ageing building stock, a high rate of homeownership by small private owners, and a limited capacity to adapt to emerging social, demographic, and environmental challenges. As explained above, while these structural features provide a clear quantitative picture of the residential sector, they are not sufficient to fully capture the ongoing transformation in the ways housing is perceived, used, and experienced by residents. In order to understand the implications of these dynamics for contemporary living environments, it is therefore necessary to complement the market-oriented perspective with a qualitative interpretation focused on the experience of dwelling and on housing as part of a broader service-oriented system.

Traditionally, housing has been predominantly conceived as a static physical asset, closely linked to ownership, long-term investment strategies, and the material characteristics of the built environment. Within this paradigm, value was primarily associated with location, size, and construction quality, while the everyday experience of living was largely considered a private matter, external to housing policy and management practices. Services, in this framework, were treated as secondary or complementary elements rather than as integral components of residential value.

However, the socio-economic trends discussed in the previous chapters - such as demographic changes, the diversification of household structures, increased residential mobility, and the growing importance of sustainability - have progressively challenged this asset-based interpretation of housing.

In response to these transformations, housing is increasingly being redefined as an integral component of broader lifestyles rather than as a standalone physical object. The concept of housing experience emphasizes how residents interact with their living environment on a daily basis, considering not only spatial features but also access to services, levels of comfort, perceived safety, opportunities for social interaction, and the ability of the dwelling to adapt to changing needs over time. This shift reflects a growing demand for flexibility, personalization, and support in everyday life, particularly in urban contexts which are usually characterized by social fragmentation and increasing complexity.

Moreover, as suggested by recent literature on servitization, many sectors are moving from product-dominant and transactional business models toward integrated service offerings and customer-orientated business models, where value is generated through ongoing interactions rather than through the mere exchange of physical goods. According to Lappalainen and Federley (2021), servitization involves the integration of products and services into coherent value propositions, where different actors collaborate to co-create value. Applying this perspective to the residential sector implies reinterpreting housing not only as a stock of physical units, but as a platform embedded within a service ecosystem. In this sense, the dwelling can be interpreted as a node within a wider ecosystem of services that extend beyond the boundaries of the individual housing unit. Services related to maintenance, cleaning, logistics, energy management, security, and community activities are increasingly perceived as integral components of the residential experience rather than as optional or ancillary elements. This trend is particularly evident in contexts where traditional forms of housing struggle to respond effectively to the needs of specific user groups, such as elderly residents, young professionals, or mobile populations, whose lifestyles require a higher degree of support and adaptability.

The growing relevance of these service-related dimensions confirms the conceptual transition from housing stock to housing experience. While the former focuses on the quantitative availability and physical condition of residential assets, the latter foregrounds the qualitative aspects of living, including well-being, usability, and social integration. Moreover, within a service ecosystem framework, value is also produced through the interaction between multiple stakeholders who contribute resources and competencies (Lappalainen & Federley, 2021). From this perspective, housing value emerges increasingly from the capacity of residential environments to offer coordinated services and to support residents' daily activities in a coherent and efficient manner. Housing experience, in this perspective, can be considered as the outcome of coordinated services and relational processes instead of the intrinsic quality of the built asset alone.

In conclusion, by adopting this lens, it becomes possible to interpret residential environments not merely as real estate assets, but as service ecosystem capable of integrating tangible and intangible components into a unified user experience and contributing to individual and collective well-being.

2.3.2 User-centric Residential Models and Increasing Governance Complexity

Building on the conceptual transition from housing stock to housing experience and service-oriented system outlined in Section “2.3.1 From Housing Stock to Housing Experience and Service-Oriented System”, this paragraph analyses how such a shift is concretely reflected in emerging residential models. If housing is increasingly interpreted as a service-oriented system, then contemporary housing formats represent practical experiments in reorganizing residential value around users' needs, lifestyles, and daily practices rather than around the mere provision of physical space.

Traditional residential models have been largely standardized, structured around nuclear households and long-term ownership patterns. As discussed in Section “2.1 New Trends and Impact on the Real Estate Sector”, however, demographic ageing, shrinking household sizes, increased mobility, and

changing work patterns are progressively undermining this model. In this context, housing demand is becoming more fragmented and differentiated, generating a need for more flexible and adaptive residential solutions.

The analysis conducted in Section “2.3.1 *From Housing Stock to Housing Experience and Service-Oriented System*” highlights how user-centricity implies a redefinition of value from a provider-driven logic to a co-created experience. Applied to housing, this perspective shifts attention toward how residents actively interact with spaces, services, and other users in shaping their living experience. For these reasons, dwelling can be considered no longer a passive condition, but a dynamic process embedded in social, economic, and relational dimension (Vargo & Lusch, 2008).

User-centric housing models therefore seek to align spatial organization, service provision, and community dynamics with specific user segments, such as students, young professionals, seniors, or mobile workers. These business models, which take different shapes depending on target groups, also imply a reorganization of management structures, service integration mechanisms, and governance arrangements - elements that progressively redefine residential value through coordinated service delivery (Lappalainen & Federley, 2021).

As previously noted, when discussing changing household structures and new forms of urban living in Sections “2.1.2 Demographic Shifts” and “2.1.3 Geopolitical and Economic Backdrop”, co-living and co-housing respond to the increasing fragmentation of traditional family models and to the growing demand for flexibility among young professionals and mobile populations. Co-housing, originally developed in Northern Europe, typically combines private residential units with shared spaces and collective governance mechanisms. Its user-centric nature lies in participatory management structures and in the intentional design of community interaction, where shared facilities and collectively organized arrangements become part of everyday living (PwC & Urban Land Institute, 2024a). By embedding shared spaces and services into the residential offer, co-housing tends to increase organizational complexity compared to standard condominium settings, particularly in terms of decision-making, rules of use, and coordination (Tummers, 2016). This model aims to foster social interaction, mutual support, and participatory governance, and although in Italy it is still limited in scale, co-housing initiatives have been explored as potential responses to social isolation, affordability issues, and ageing populations. Co-living, in contrast, is generally market-driven and professionally managed, often defined as a flexible housing solution that adds a structured “layer of services” to shared living arrangements. It targets mobile urban users who prioritize flexibility, convenience, and community, and it is frequently discussed as part of broader transformations in real estate shaped by technology, new consumer habits, and “as-a-service” logics (JLL, 2017). In co-living, service integration is more explicit: contracts often bundle cleaning, maintenance, utilities, high-speed internet, digital access systems, and community programming into a single fee. Professional operators coordinate these services through centralized management structures, frequently supported by digital platforms that enable communication, bookings of shared spaces, and service requests (Lappalainen & Federley, 2021). Operators are also responsible for organizing community events, supervising maintenance and cleaning, and managing digital access systems and, in some cases, mobility or wellness services, so that the housing unit becomes part of a broader lifestyle product.

Moreover, the demographic ageing discussed in Section “2.1.2 Demographic Shifts” has generated increasing demand for residential solutions capable of combining autonomy with support. Senior housing formats - ranging from assisted living to independent living with service packages - represent a structured response to this transformation. These models place the user at the center by designing environments that accommodate reduced mobility, healthcare needs, and social inclusion. Service integration is not ancillary but foundational: healthcare support, emergency systems, catering,

cleaning, social activities, and security are systematically embedded within the residential offering (Buildbull, 2025). Management is typically professionalized and operates through clearly defined organizational hierarchies, increasingly supported by digital systems for monitoring, access control, and service coordination (Lappalainen & Federley, 2021). The complexity of these models arises from the need to integrate medical, social, and property management functions within a coherent governance framework.

On the other hand, the expansion of international mobility and the diversification of educational pathways - already discussed in Sections “2.1.2 Demographic Shifts” and “2.1.3 Geopolitical and Economic Backdrop” as components of broader socio-economic change - have stimulated the development of purpose-built student housing. Unlike traditional rental housing, student housing is structured around bundled services and community-oriented environments. User centrality is reflected in fully furnished units, flexible lease terms, study areas, social spaces, and organized activities. Service integration includes utilities, maintenance, security, digital access systems, and often platform-based communication tools. Management is highly professionalized, frequently operated by specialized companies or institutional investors, and digital platforms support booking processes, payment systems, communication, and facility management. As in co-living, the student housing model demonstrates how residential environments can function as managed service systems rather than fragmented property assets.

Alongside market-oriented user-centric formats, social housing represents a further and highly relevant residential model. In this case, user centrality is primarily pursued through an explicit social mission: the provision of affordable and adequate dwellings for households that struggle to access the market, often combined with support services and community-oriented functions aimed at social inclusion and neighborhood stability. In European residential investment and policy debates, social and affordable housing are increasingly framed as strategic sub-sectors supported by public measures and public-private partnerships, precisely because they combine long-term demand stability with measurable social outcomes (PwC & Urban Land Institute, 2024a). These initiatives often integrate not only physical space but also forms of coordinated management, tenant support, and shared services (e.g., social concierges, mediation activities, and community spaces), thereby increasing the organizational complexity of the residential offering (Bruno, 2022).

A different trajectory that helps connect the above models with additional emerging formats is the evolution of rental housing, which is progressively moving from fragmented, small-scale private ownership toward more structured, professionalized, and in some cases institutional configurations. Recent European market outlooks describe the private rented sector (PRS) as an increasingly relevant segment, including build-to-rent schemes, and highlight how rental demand is strengthened by affordability pressures and rising barriers to homeownership; in parallel, operators and investors increasingly focus on ESG-compliant assets and on the quality of the tenant experience, reinforcing the shift from “asset ownership” to “service provision” (PwC & Urban Land Institute, 2024a). This evolution makes room for residential solutions that sit at the boundary between housing and hospitality and that are explicitly designed around service integration and operational standardization.

In this perspective, apart-hotels and short-term rental residences - already mentioned as growing “non-traditional” formats within the broader real estate investment landscape - can be interpreted as precursors of serviced residential solutions where the user experience is packaged through furnished units, flexible stays, and integrated services (KROLL, 2024). Serviced apartments, instead, represent a hybrid model between hospitality and long-term residential use, particularly relevant in contexts characterized by temporary work assignments and increasing professional mobility. Here, the user experience is structured around flexibility and convenience: furnished units, short- to medium-term

leases, housekeeping, reception services, and maintenance are integrated into a unified offering. Professional operators manage the entire building as a coordinated system, often relying on digital booking platforms and centralized facility management systems (Lappalainen & Federley, 2021). The residential unit is explicitly positioned as part of a service package, and the boundary between housing and hospitality becomes increasingly blurred, reinforcing the idea of housing as an access-based, service-mediated experience.

Table 3 summarizes the main user-centric residential models discussed in this section, comparing their management configuration and their user-centricity and service integration.

New residential models	Features	Management configuration	User-centricity & service integration	Main reference(s)
Co-housing	Combination of private units and extensive shared spaces, designed to support community, mutual aid and collective activities. Strong emphasis on participatory design and governance.	Hybrid governance: often cooperative or association-based, with residents directly involved in rules, use of shared spaces and organisational choices.	User-centricity expressed through participatory governance, intentional community building and tailored shared services; high organisational complexity.	PwC & Urban Land Institute, (2024a); Tummers (2016).
Co-living	Market-driven, professionally managed shared living model targeting mobile urban users (students, young professionals, digital workers), with a “layer of services” bundled into the rent.	Centralised professional operator coordinating leases, maintenance, cleaning, utilities, community events and digital access; often platform-supported.	Contracts bundle multiple services (utilities, Wi-Fi, cleaning, events); strong focus on convenience and experience, with limited resident control over governance.	JLL (2017); Lappalainen & Federley (2021).
Senior housing	Residential solutions for older adults combining private living units with integrated care, safety and socialisation services.	Professionalised management with clear organisational hierarchies; coordination of medical, social and property-management functions, increasingly supported by digital systems.	User-centric design around accessibility, safety and support; service integration (healthcare, catering, cleaning, social activities) is structural, not ancillary.	Buildbull (2025); Lappalainen & Federley (2021).
Student housing	Housing specifically designed and managed for students, with furnished units, shared study/social spaces and bundled services.	Highly professional management, often by specialised operators or institutional investors; extensive use of digital platforms for booking, payments, communication and facility management.	Strong focus on the student experience (flexible leases, community, shared spaces); services (utilities, security, maintenance, digital tools) integrated into the package.	Lappalainen & Federley (2021); PwC & Urban Land Institute (2024a).
Social / affordable housing	Housing provided at below-market conditions, often targeted at vulnerable or low-income households and combined with support and community services.	Mix of public entities, non-profit organisations and public–private partnerships; coordinated management of spaces, social services and support functions for tenants.	User-centricity expressed through an explicit social mission (access, stability, inclusion) and support services; high organisational complexity in reconciling social, financial and managerial objectives.	Bruno (2022); PwC & Urban Land Institute (2024a).

Serviced apartments	Hybrid format between hospitality and medium-term residential use; furnished units with integrated services (housekeeping, reception, maintenance).	Centralised management by professional operators; the building is treated as a single asset with standardised processes and extensive use of digital platforms for booking and facility management.	User experience built around flexibility and “all-inclusive services” with hotel-like standards; strong integration between space, services and digital processes.	Lappalainen & Federley (2021); KROLL (2024).
Apart-hotels / short-term rental residences	Short-stay formats that combine hotel-type features with residential elements, often located in dense urban areas with high demand.	Hospitality operators or short-stay specialists; highly standardised management, strongly supported by digital platforms for booking and check-in/check-out systems.	Centrality of the stay experience (flexibility, services, location); strong integration with digital infrastructures and revenue-management tools.	KROLL (2024); PwC & Urban Land Institute (2024a).

Table 3. User-centric residential models, management configuration and user-centricity. Source: Own elaboration

It is important to notice that what these user-centric models share is not merely the presence of shared spaces, but the systematic integration of services into the residential offering and the growing importance of organizational capacity in coordinating them. In this way, the dwelling becomes embedded within an organized framework of service delivery, governance mechanisms, and relational infrastructures, where residential value increasingly depends on the ability to align multiple actors, technologies, and procedures (Vargo & Lusch, 2008).

However, although the user-centric models discussed in this section are expanding and attracting growing attention also in the national context, they still represent a relatively small share of the overall Italian stock when compared to the widespread condominium form. Nevertheless, the pressures and logics underpinning these emerging formats - service integration, professional management, and platform-based coordination - are progressively affecting condominium contexts as well, pushing them toward a more service-oriented interpretation of residential living, which are increasingly confronted with new expectations regarding services, digital tools, and shared functions.

The next section will therefore introduce Housing-as-a-Service as an interpretative framework to examine the implications of this shift toward service-oriented housing that will be applied also to the condominium context.

2.3.3 Housing-as-a-Service: Conceptual Framework and Implications

The user-centric residential models discussed in Section “2.3.2 *User-centric residential models and increasing governance complexity*” show how contemporary housing formats increasingly organize value around coordinated services, professional management, and resident experiences. In this context, the notion of Housing-as-a-Service (HaaS) offers a more structured and operational articulation of the experience-oriented paradigm introduced in Section “2.3.1 *From Housing Stock to Housing Experience and Service-Oriented System*”, providing a conceptual lens to interpret both emerging residential products and the gradual transformation of more traditional configurations.

Within this conceptual evolution, Housing-as-a-Service can be defined as a residential model in which accommodation is delivered as a continuously managed and service-integrated offering, where value emerges from coordinated service provision, digital enablement, and user interaction (Mishul Gupta, 2025). This model focuses on offering a comprehensive housing solution that goes beyond the binary distinction between owning and renting a property, providing a flexible, subscription-like experience. Under this scheme, residents pay a recurring fee that includes not only the right to use a unit, but also a

bundle of additional services - such as furniture and appliances, maintenance, utilities, access to common areas, and cleaning or concierge functions - that are coordinated as part of a single residential product (HOMETY, 2024). In this sense, housing becomes an access-based, service-mediated experience that reduces long-term commitments for users and shifts attention to the quality, reliability, and adaptability of service delivery.

Although HaaS is more evident in purpose-built formats such as co-living, student housing, or senior living, some of its underlying logics are increasingly relevant for the condominium context. The growing demand for additional services, greater coordination, and digital channels suggests that condominium environments are also moving - although more slowly and unevenly - towards a more service-oriented interpretation of residential living.

2.4 The Condominium as a Fragmented Micro-Service Ecosystem and Stakeholder Network

The conceptual transition from housing stock to housing experience, together with the spread of user-centric and HaaS models, have suggested that residential value increasingly depends on coordinated services, governance mechanisms, and multi-actor interactions rather than on physical dwelling alone (Vargo & Lusch, 2008). Within this transformation, the condominium represents a particularly relevant context in which service-oriented logics and user-centric expectations are progressively reshaping a traditionally asset-based and fragmented organizational model.

As discussed in Section “2.2.1 *Structure of the Italian Residential Sector*”, the Italian residential sector is characterized by widespread homeownership and a limited presence of institutional actors, conditions that have historically constrained the diffusion of standardized, service-oriented housing solutions. In this context, the condominium remains the dominant housing configuration, making it a key setting for observing the gradual shift from asset-based housing to service-oriented living. Unlike purpose-built models (such as co-living, PBSA, senior living, serviced formats, etc.), which are conceived as integrated service systems, the condominium evolves more incrementally: services develop around a shared physical infrastructure but are not necessarily designed as part of a coherent residential experience (Lappalainen & Federley, 2021).

Although some recent new-build condominiums - particularly in the luxury segment - already incorporate more service-oriented features, such as enhanced amenities and, in some cases, subscription-based services supported by more centralized management, these examples remain limited compared to the broader housing stock, which largely consists of buildings constructed before the 2000's.

From a service-dominant perspective, as explained in section “2.3.1 *From Housing Stock to Housing Experience and Service-Oriented System*”, housing value can be understood as the outcome of interactions and resource integration among multiple actors, rather than as an intrinsic property of the physical asset. Applied to condominiums, this perspective frames the building not simply as a collection of privately owned units, but as a micro-scale ecosystem in which shared services contribute to residents' everyday experience (Bruno, 2022). Even basic condominium services require continuous coordination of tasks, information, and responsibilities over time, implicitly positioning the condominium as a service system, albeit one that remains fragmented and weakly integrated.

Despite these structural limitations, the condominium is not static. As previously noted, Italian condominium living is increasingly influenced by evolving expectations regarding shared functions, additional services, and technology-enabled communication. This is gradually pushing the model toward a hybrid configuration that combines traditional co-ownership governance with more service-oriented logics. While condominiums are unlikely to become fully managed platforms in the short term, the ability to integrate and coordinate services is becoming increasingly central to the quality and sustainability of residential life (Lappalainen & Federley, 2021).

From this perspective, the condominium can be interpreted as a fragmented micro-ecosystem: a localized environment where multiple shared services are delivered around a common physical infrastructure, often through loosely coordinated arrangements and episodic decision-making. At the same time, it brings together a heterogeneous network of stakeholders whose roles, responsibilities, and interests are only partially aligned.

Finally, the condominium can also be seen as a context in which a digital layer is progressively emerging alongside existing organizational structures. Without replacing traditional governance mechanisms,

digital tools increasingly mediate communication, information flows, and service-related interactions. In this sense, the condominium evolves into a residential ecosystem in which coordination challenges are not only physical and organizational, but also increasingly digital and relational. Seen in this way, the condominium becomes a particularly significant case for investigating why greater integration, transparency, and responsiveness have become increasingly relevant within contemporary residential systems and how digital solutions can support these objectives.

The visual scheme below (*Diagram 1*) synthesizes the theoretical background and contextual analysis developed in this chapter. In particular, it shows how exogenous drivers, endogenous features of the Italian residential sector, and emerging user-centric and service-oriented trends converge to reshape residential environments and governance arrangements. By synthesizing these three levels into a single framework, the diagram positions the condominium as a micro-scale residential ecosystem and stakeholder network shaped by global pressures, national specificities, and changing housing experiences, thereby providing the conceptual bridge between the theoretical background and the research framing presented in next chapter.

FROM MACRO TRENDS TO THE CONDOMINIUM AS A RESIDENTIAL ECOSYSTEM

Synthesis of exogenous, endogenous and experiential factors shaping the research framework (Chapters 2.1– 2.2 - 2.3)

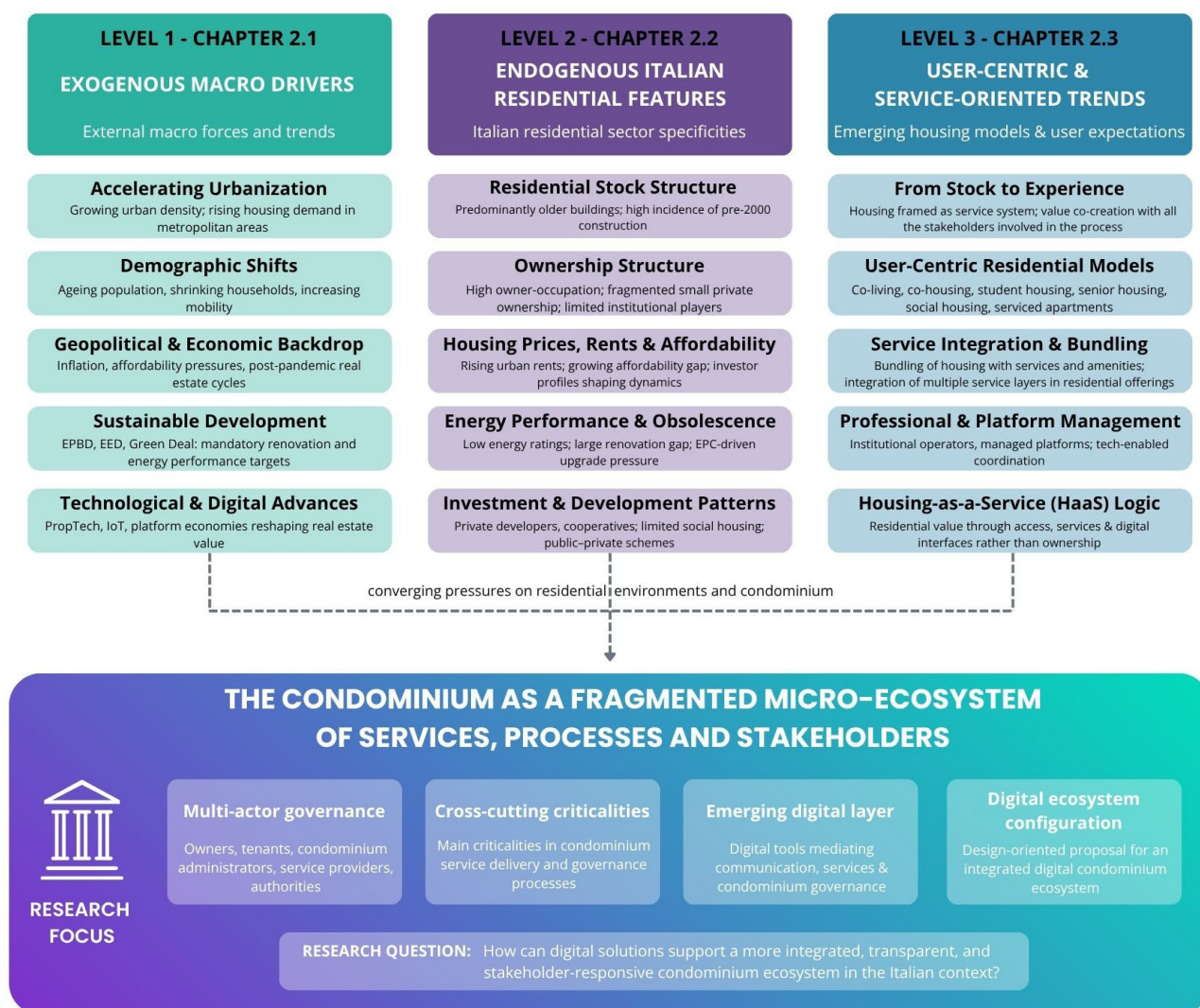


Diagram 1: Visual scheme of exogenous, endogenous, and user-centric factors (Chapters 2.1-2.2-2.3) and their convergence on the research focus on the condominium as a fragmented ecosystem of services, processes, and stakeholders. Source: Own Elaboration.

3. Research Framing and Methodology

3.1 Research Problem and Aim

Building on the theoretical and contextual background developed in the previous chapters, this section reframes the condominium as a research object and clarifies the specific question that guides this research, its aim and the methodological approach used to address it. This framing is fundamental to highlight the several implications for condominium contexts and their evolution into more dynamic and complex environments.

The State of the Art, presented in Chapter “*2. Theoretical Background: Evolution of the Real Estate Sector and New Housing Needs*”, has shown this ongoing transformation of the real estate sector, both internationally and in the Italian context. In particular, Chapter “*2.1 New Trends and Impact on the Real Estate Sector*” has highlighted that the residential real estate sector is undergoing a profound and multidimensional transformation. Historically characterized by stability and predictability, the real estate market operated for decades according to cyclical patterns and well-established business models. However, in recent years, this equilibrium has been disrupted by a convergence of global phenomena - ranging from demographic shifts and urbanization to the green transition, digital innovation, and broader socio-economic shifts - which have reshaped the ways people live and experience residential space.

Within this complex and dynamic framework, housing can no longer be understood merely as a physical asset or as a matter of ownership, but increasingly as a hybrid ecosystem of services, experiences, and relationships, capable of adapting to evolving lifestyles and collective needs. This redefinition of the dwelling space is particularly relevant in the condominium contexts, where the interaction between space, services, users, and governance arrangements makes evident the challenges and opportunities brought by this transition.

The structural analysis of the Italian residential sector developed in Chapter “*2.2 Residential Sector Evolution: National Trends and European Comparison*” has revealed persistent issues such as the ageing housing stock, high rates of individual ownership by small private actors, a limited presence of public and private institutional players, and a limited diffusion of structured and service-oriented residential models. These conditions, combined with cultural and regulatory rigidities, have hindered the widespread adoption of innovative housing models and more integrated forms of residential management and service provision, especially when compared to other European countries such as France and Germany.

At the same time, however, the emergence of new housing needs - such as flexibility, energy efficiency, affordability, and digital integration - has opened up new areas of intervention and innovation. In this evolving scenario, the condominium is increasingly exposed to new expectations related to service quality, transparency, responsiveness, and coordination among actors.

The analysis developed in Chapter “*2.3 Redefining Housing: From Physical Space to Service Ecosystem and Stakeholders Network*” framed this transition through the lens of service-oriented housing and Housing-as-a-Service, highlighting how residential value, especially in the condominium context, increasingly depends on coordination processes, communication dynamics, governance capacity, and stakeholder interaction. Moreover, these considerations suggest that the main challenge is not only managerial in a narrow administrative sense, but also organizational and relational, since it concerns the broader capacity of the condominium system to support coherent interactions and service integration.

Against this backdrop, the aim of this thesis is to investigate the extent to which digitalization can act as an enabling infrastructure for rethinking the condominium ecosystem in the Italian context. More specifically, the research seeks to understand how digital solutions may support more integrated service coordination, more transparent information flows, and more responsive interactions among the stakeholders involved in condominium life and governance. Rather than treating digital technologies as isolated tools, the thesis approaches them as potential organizational and relational enablers within a fragmented residential environment in transition.

3.2 Research Question and Objectives

In light of these considerations, this thesis is guided by the following central research question:

How can digital solutions support a more integrated, transparent, and stakeholder-responsive condominium ecosystem in the Italian context?

This research question reflects the theoretical framework developed in the previous chapters, where the condominium has been interpreted as a fragmented ecosystem and a structurally interdependent environment rather than as a purely administrative or technical setting. At the same time, the explicit focus on the Italian condominium framework responds to the central role that condominiums play in the national residential sector and to the need to analyze digitalization within a specific governance, regulatory and market setting.

Following this perspective, the first objective of the thesis is to identify and systematize the main needs, expectations, and recurring inefficiencies emerging across the key actors involved in condominium life, namely residents, condominium managers, and service providers. This diagnostic phase is intended to build an analytical framework capable of translating a fragmented set of issues into broader categories that can guide the subsequent evaluation of digital solutions.

Building on this problem framing, the second objective is to examine how selected digital solutions currently operating in the condominium and residential field respond to these needs and criticalities through different functional features, service logics, and coordination mechanisms.

The purpose is not simply to describe available technologies, but to assess them in relation to the organizational and relational gaps identified in the condominium ecosystem. Particular attention is therefore given to the ways in which digital tools may contribute to improving traceability, accessibility of information, workflow management, service coordination, and interaction among stakeholders.

The third objective of the research is to compare the identified stakeholder needs with the characteristics of existing digital solutions in order to highlight convergences, limitations, and unresolved gaps. This comparative step is essential for moving from a descriptive analysis of current tools toward a more critical understanding of where the present market already provides effective responses and where further innovation is still needed.

Finally, the thesis aims to use the insights emerging from this comparison to inform a design-oriented reflection on possible directions for innovation in the Italian condominium context. In this way, the intended outcome of the research is not the validation of a single technological model, but the definition of a more structured interpretative and project-oriented framework through which digitalization can be understood as a lever for improving integration, transparency, and stakeholder responsiveness in condominium governance and service delivery.

3.3 Methodological Approach

The methodological approach adopted in this thesis is primarily qualitative, interpretative, and desk-research-based. Rather than relying on primary empirical data collection as its core methodological foundation, the research develops a structured analytical path aimed at linking the theoretical reframing of housing developed in previous chapters with the diagnosis of condominium criticalities and the evaluation of digital solutions in the subsequent sections.

This approach is consistent with the central research question of the thesis, which investigates how digital solutions can support a more integrated, transparent, and stakeholder-responsive condominium ecosystem in the Italian context. In methodological terms, this means that the research does not focus on measuring the adoption of a single technology or testing a predefined causal hypothesis, but on constructing an interpretative framework capable of connecting structural characteristics, stakeholder needs, recurring inefficiencies, and the functional potential of digital solutions.

The research process is articulated into four main methodological steps. First, a theoretical and contextual desk research activity is conducted in order to build the conceptual and sectoral basis of the study. Second, the findings emerging from the analysis of the condominium context are reorganized into an analytical framework of stakeholder needs and cross-cutting criticalities. Third, a comparative case study analysis of selected digital solutions is carried out in order to assess how different platforms and tools address the previously identified needs and gaps. Finally, the results of this comparison are translated into a functional mapping and a design-oriented reflection intended to identify possible directions for innovation in condominium governance and service delivery.

3.3.1 Theoretical and Contextual Desk Research

The first methodological component of the thesis is based on a desk research approach aimed at building the theoretical and contextual foundation of the study. This phase involved the collection, selection, and interpretation of a broad range of sources, including academic literature, institutional publications, regulatory documents, market reports, and sector-specific materials relevant to the transformation of housing, the Italian residential context, condominium governance, stakeholder dynamics, and digital innovation in residential services.

The desk research was structured in line with the main topics developed throughout the thesis in order to ensure coherence and continuity across chapters. Within this multilevel structure, the desk research was developed through both a scalar and an analytical progression. On the one hand, it adopts an international and European perspective to frame the broader transformations affecting the residential sector and to contextualize the emergence of new housing models and service-oriented logics. On the other hand, it progressively narrows its focus to the Italian context, where the specific structural features of the residential market make the condominium a particularly relevant field for observing the tensions between traditional governance arrangements and new expectations related to service quality, coordination, transparency, and digital integration.

From a conceptual point of view, this phase is essential to support the theoretical transition from housing as a static physical asset to housing as a service-oriented and relational ecosystem. In this sense, the desk research provides the interpretative basis for adopting Housing-as-a-Service and user-centric perspectives as analytical lenses through which the condominium can be reframed not simply as a legal or physical entity, but as a fragmented micro-ecosystem shaped by stakeholder interdependencies, coordination needs, and service integration challenges.

The source selection process was guided by thematic relevance, coherence with the thesis structure, and the need to integrate both theoretical and practice-oriented perspectives. The literature review therefore incorporated different types of sources:

- Scientific literature, including peer-reviewed journal articles, academic books, and research contributions retrieved through academic databases and search engines such as Scopus, Google Scholar, and ResearchGate;
- White literature, including institutional publications, statistical reports, policy papers, and regulatory documents issued by national and European bodies such as ISTAT, Eurostat, ENEA, the European Commission, and other public institutions;
- Grey literature, including reports by industry associations, professional organizations, think tanks, working papers, sector-specific books, and selected materials derived from webinars, conferences, and events involving private actors and market operators.

This broad and integrated source base made it possible to combine theoretical developments with more practice-oriented insights and to reflect both the structural evolution of the residential sector and the characteristics of the condominium context. In methodological terms, the desk research integrated both quantitative and qualitative inputs. Quantitative evidence was mainly drawn from statistical databases, institutional datasets, and sector reports in order to frame market structures, demographic trends, housing stock characteristics, and broader residential dynamics. Qualitative insights were instead derived from academic literature, policy documents, expert reports, and sector analyses, which were particularly useful in interpreting the transformation of housing, the reconfiguration of stakeholder roles, and the growing relevance of service integration and digital enablement.

Although this review was not conducted according to a fully systematic literature review protocol, the source selection followed a structured and consistent logic based on relevance to the research question, alignment with the analytical objectives of the thesis, and capacity to contribute to the interpretative framework being constructed. Priority was given to recent and up-to-date sources published in English and Italian in order to capture the most relevant developments in the field. In addition, part of the research process relied on backward reference tracking, namely the exploration of the bibliographies of selected documents in order to identify further relevant sources and progressively refine the conceptual base of the study.

Overall, this theoretical and contextual desk research provided the necessary foundation for the subsequent methodological steps of the thesis. More specifically, it enabled the research to move from the reconstruction of the broader transformation of housing and the Italian residential context to the analytical framing of condominium stakeholder needs and criticalities, and subsequently to the comparative assessment of digital solutions and the identification of possible design-oriented directions for innovation.

3.3.2 Analytical Framing of Stakeholder Needs and Criticalities

The second methodological step consists of the analytical framing of stakeholder needs, expectations, challenges, and opportunities within the condominium context. This phase builds upon the desk research evidence collected and discussed in Chapter “4. *The Italian Condominium context: Physical Structure and Stakeholder Needs*”, where the condominium is examined as a structurally interdependent socio-technical environment involving residents, owners, condominium managers, and service providers.

Rather than remaining at a descriptive level, this step aims to reorganize a heterogeneous body of evidence into a more structured analytical framework capable of capturing both actor-specific issues

and cross-cutting governance dimensions. In particular, the analysis focuses on those recurring challenges that emerge not only within individual stakeholder groups, but also at the intersection between actors, services, and information flows, such as fragmented communication channels, information asymmetries, limited transparency, low traceability, coordination delays, and the increasing complexity of managing multi-actor service provision.

Methodologically, this phase combines interpretative synthesis and visual comparison. Starting from the evidence derived from desk research, the main challenges and opportunities associated with the condominium system and with each stakeholder group were progressively classified and reorganized into comparative diagrams and summary tables. These outputs were used to highlight recurring patterns, points of divergence, and possible areas of convergence among the different actors involved in condominium life and management.

Particular attention was then devoted to the identification of shared and overlapping criticalities. To support this objective, the results of the previous analytical reorganization were further synthesized through a Venn Diagram aimed at visualizing the main individual and shared challenges among key condominium stakeholders. This representation made it possible to distinguish between actor-specific issues and systemic governance problems, showing how many of the most relevant criticalities emerge at the level of stakeholder interaction rather than within isolated actors.

The output of this phase is therefore an analytical framework of needs, challenges, opportunities, and criticalities organized around the main stakeholder groups and the transversal issues affecting the condominium as a whole. This analysis does not aim to provide an exhaustive taxonomy of all possible condominium problems; rather, it identifies the most recurrent and analytically relevant dimensions for the purposes of the research.

This step is methodologically significant because it creates the bridge between contextual diagnosis and solution assessment. By translating the findings of Chapter “4. *The Italian Condominium context: Physical Structure and Stakeholder Needs*” into a structured problem-framing framework, the thesis avoids a purely narrative discussion of condominium inefficiencies and instead develops a set of interpretative categories that can inform the analysis conducted in Chapter “5. *Digitalization as a driver of change in the condominium context*”. In this sense, the dimensions identified constitute the basis both for framing the key structural gaps of the condominium ecosystem and for defining the criteria through which existing digital solutions can be comparatively assessed in relation to actual stakeholder needs and governance challenges.

3.3.3 Comparative Analysis of Digital Solutions

The third methodological component of the thesis consists of a comparative analysis of digital solutions operating in the condominium and residential management field. The objective of this phase is to identify and examine a focused set of solutions whose functions, target users, and service logic appear particularly relevant to the research question and to the criticalities emerging from the analytical framing developed in the previous step.

The identification of the solutions is based on the Italian PropTech Network (IPN) database and related monitoring activities, which provide an organised overview of PropTech companies operating in the Italian market and was accessed in its 2025 configuration. The Italian PropTech Network, developed within the Real Estate Center of Politecnico di Milano, is a national hub that maps and aggregates startups, scaleups and other digital players contributing to a synergic exchange of knowledge and innovation in the Italian real estate sector (Italian PropTech Network, 2026). Using the IPN database as a starting point, it was possible to have a structured and regularly updated mapping of the Italian PropTech landscape, which reduces the risk of relying on subjective or opportunistic case selection, and

to focus on digital solutions specifically targeting real estate processes, ensuring a high level of alignment between the companies included in the database and the scope of this thesis.

From this initial pool, a multi-step filtering procedure was implemented, combining cluster-based criteria with keyword searches and qualitative assessment of relevance.

First, a cluster-level selection was carried out in order to narrow the focus to solution types that are more directly connected to service delivery, management, and user interaction in residential contexts. Solutions classified under the REAL ESTATE FINTECH cluster were excluded, as they primarily address financial services and investment rather than everyday condominium life. Conversely, solutions belonging to the CONTECH, PROFESSIONAL SERVICES, SHARING ECONOMY, and SMART REAL ESTATE clusters were retained, resulting in a subset of solutions (total of 324 solutions).

Second, a more granular selection was performed at sub-cluster level. Solutions associated with *“building site & project management”*, *“business processes & marketing”*, *“coliving & accommodation”*, *“contract/deals/agreement”*, *“design & consulting”*, *“hospitality management”*, *“immersive visualization & experience”*, *“smart sustainable building”*, *“space as a service”*, *“structural monitoring and virtual built environment”* were excluded, as they relate either to upstream processes, hospitality formats, or building-centric technologies that only indirectly affect condominium governance. The analysis instead concentrated on the following sub-clusters: *“community life”*; *“data insights, location intelligence & advisory”*; *“integrated management & operations”*; *“property & asset management”* and *“supplier marketplace”*. This step led to a reduced set of 129 solutions.

Third, in order to isolate platforms more closely aligned with condominium dynamics, a targeted keyword search was performed within the “Description” field of the database. The search focused on Italian terms explicitly referring to condominium stakeholders and settings, namely *“condominio/i”*, *“residente/i”*, *“inquilino/i”*, *“amministratore/i”*, and *“fornitore/i”*. This operation yielded 21 non-duplicate solutions that explicitly reference condominium environments, residents, tenants, administrators, or suppliers in their description.

Fourth, this shortlist was further refined through an in-depth desk research combining analysis of company websites, product documentation, social media channels, sector reports, and references from the PropTech literature, complemented by the author’s prior experience in the field. The aim of this step was to identify solutions that appeared particularly relevant to the research question in terms of functional coverage, maturity, and potential impact on the condominium ecosystem. This process resulted in a final selection of nine platforms drawn from the IPN database.

In addition to these nine solutions identified through the Italian PropTech Network database, one further platform was purposefully included. During the screening of the CONTECH – SUPPLIER MARKETPLACE sub-cluster it emerged that, despite the relevance of supplier marketplaces for coordinating construction and maintenance services, no solution explicitly mentioned condominium contexts in its database description when using the same Italian keywords. To address this gap, an additional web-based search was carried out, leading to the identification of a recently established platform explicitly designed to connect condominium administrators with qualified suppliers. Although not present in the 2025 database, this solution was therefore purposefully added to the case study set as a paradigmatic example of a supplier marketplace tailored to condominium ecosystems.

The following diagram (*Diagram 2*) represents the entire process, showing how the initial set of solutions was progressively narrowed down through cluster and sub-cluster selection, targeted keyword search, and desk research to obtain the final sample used in the comparative analysis.

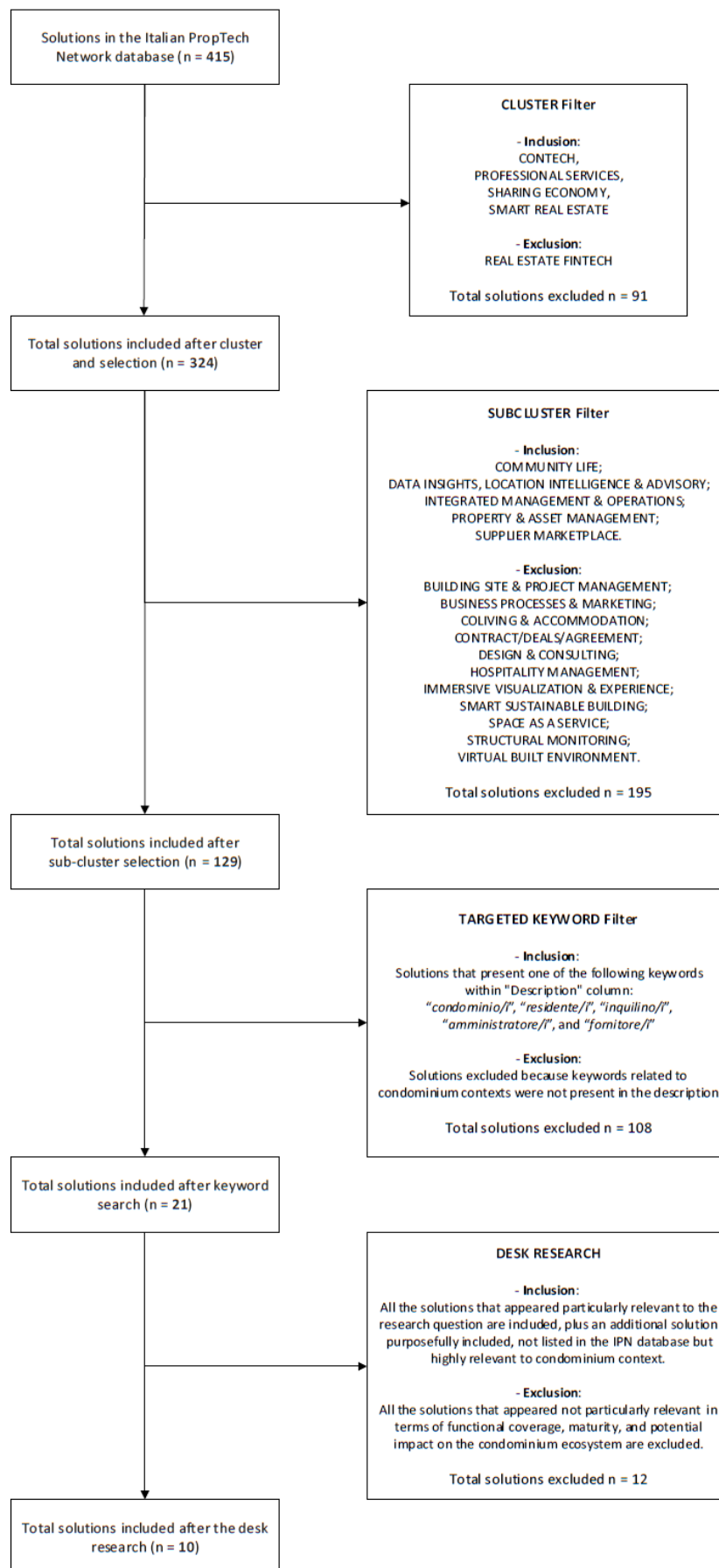


Diagram 2: PRISMA diagram of the searched and included solutions. Source: Own Elaboration

It is important to notice that the selection does not aim to cover the entire PropTech landscape, but rather to isolate those solutions most closely related to condominium management, residential services, property management processes, or digital functions transferable to the condominium context. The screening process is therefore guided by the relevance of the solutions in relation to the main analytical dimensions emerging from Chapter “4. *The Italian Condominium context: Physical Structure and Stakeholder Needs*”, as well as by the availability of sufficiently clear and accessible information on the platforms’ functionalities through public company materials, websites, and other available sources.

Rather than adopting a market-performance perspective, this phase follows a functional and comparative logic. The purpose is not to assess adoption rates, economic success, or firm competitiveness, but to compare the solution logics embedded in the selected tools and to understand which stakeholder needs, governance issues, and operational gaps they appear better equipped to address. In this sense, digital solutions are analyzed not as isolated technological artefacts, but as organizational and service devices that may support different degrees of integration, traceability, responsiveness, information sharing, and coordination across the condominium system.

Once the sample had been defined, the comparative analysis was developed through three main analytical layers. First, each solution was qualitatively analyzed in relation to six analytical criteria derived from the needs and recurring problems identified in Chapter “4. *The Italian Condominium context: Physical Structure and Stakeholder Needs*”. This first layer resulted in a qualitative comparative grid describing how, and to what extent, each platform addresses the six criteria through its main functions and service logic.

Second, the analysis was extended to two complementary dimensions aimed at better capturing the ecosystem configuration of the selected solutions: the main stakeholder groups addressed and the digital channels activated. More specifically, the comparison considered whether and how each platform directly involves residents, owners or tenants, condominium managers, service providers, and other relevant actors, as well as which digital infrastructures are mobilized, including mobile applications, web portals, dashboards, notification systems, ticketing tools, marketplaces, physical interfaces, IoT integrations, and APIs. This made it possible to move beyond a purely functional reading and to assess the breadth of the actor network and of the interaction architecture enabled by each solution.

Third, in order to support a more systematic comparison across cases, the qualitative evidence collected for each solution was translated into a semi-quantitative rating system based on a 0-1-2 scale. The score does not measure business success or technological maturity; rather, it indicates the extent to which each solution functionally addresses the six analytical criteria, distinguishing between absent or negligible coverage, partial or indirect coverage, and more robust and integrated coverage. The resulting scores were then synthesized in comparative tables and visual outputs showing average criterion coverage, the distribution of coverage levels across criteria, total functional scores by solution, stakeholder reach, digital channel activation, and the broader ecosystem orientation of the selected cases.

For each solution selected, information was triangulated using multiple public sources, including official company websites, product documentation, LinkedIn pages, sector reports and, where available, direct exchanges with company representatives, in order to reconstruct not only declared functionalities but also the underlying service logic and target configuration. This triangulation strategy was adopted in order to reduce reliance on self-promotional claims alone and to reconstruct not only the declared functionalities of each platform, but also its target configuration, service logic, and position within the condominium ecosystem. As explained before, this desk-research strategy is

consistent with the qualitative and interpretative nature of the thesis and with its focus on functional coverage rather than on firm performance or market share.

Methodologically, this phase serves as the bridge between problem framing and solution assessment. On the one hand, it translates the criticalities emerging from the condominium context into a structured set of analytical dimensions through which digital solutions can be compared. On the other hand, it makes it possible to identify convergences, functional gaps, and mismatches between the needs of a fragmented residential ecosystem and the current configuration of the PropTech offer. In this way, the comparative analysis provides the empirical and interpretative basis for the final design-oriented reflection.

3.3.4 Functional Mapping and Design-Oriented Outcome

The fourth step of the methodology consists in translating the results of the comparative analysis into a functional mapping and a design-oriented outcome. This phase represents the synthesis of the research process and is intended to connect the diagnostic perspective developed in Chapter “4. *The Italian Condominium context: Physical Structure and Stakeholder Needs*” and the analysis of the current landscape conducted in Chapter “5. *Digitalization as a driver of change in the condominium context*” with the solution-oriented perspective developed in Chapter “6. *Discussion and conceptual proposal for an integrated digital condominium ecosystem*”.

More specifically, the functional mapping aims to relate the main categories of stakeholder needs and condominium criticalities to the functions offered by the selected digital solutions. In this way, the thesis identifies areas of alignment, partially covered needs, and unresolved gaps. This makes it possible to distinguish between functionalities that already respond effectively to recurring problems and areas where the market still appears fragmented, underdeveloped, or insufficiently responsive to the complexity of condominium governance.

The design-oriented outcome does not consist in the technical development of a digital platform, nor in the validation of a single business model. Rather, it consists in the formulation of a structured interpretative and project-oriented framework capable of informing future innovation trajectories in the Italian condominium context. In other words, the goal is to derive from the analysis a set of functional priorities, possible strategic directions, and innovation opportunities through which digitalization can be understood as an enabling lever in the condominium ecosystem.

This final step is coherent with the broader positioning of the thesis, which does not aim to demonstrate that digitalization automatically solves condominium inefficiencies, but rather to clarify under which conditions and through which functional mechanisms digital solutions may contribute to improving governance, communication and service coordination in a fragmented residential ecosystem.

4. The Italian Condominium Context: Physical Structure and Stakeholder Needs

This chapter explores the Italian condominium as a complex socio-technical system shaped by the interactions among multiple stakeholders, each characterized by distinct roles, expectations, and constraints. Moving beyond a purely legal or technical interpretation of condominium context, the chapter adopts a relational and governance-oriented perspective on Italian multi-owner residential buildings, focusing on how residents, condominium managers, and service providers collectively influence the quality, efficiency, and sustainability of residential living.

The analysis is structured around four key dimensions: the condominium as an organizational and social entity, the needs and expectations of condominium residents, the evolving professional role of the condominium manager, and the operational ecosystem of service providers. For each dimension, the chapter examines structural characteristics, the main relational dynamics among stakeholders, recurring inefficiencies, and emerging pressures related to life and service quality, cost control, regulatory complexity, and communication flows.

Particular attention is devoted to identifying the main challenges and opportunities faced by each actor, highlighting both actor-specific issues (summarized in tables at the end of each sub-chapter) and cross-cutting criticalities (represented by a Venn diagram at the end of the chapter) that affect the condominium system as a whole. Themes such as information asymmetry, fragmentation of services, increasing expectations for transparency and responsiveness, and the growing complexity of maintenance and regulatory compliance emerge as central elements of analysis.

By systematically mapping these dynamics, the chapter lays the analytical groundwork for understanding why traditional condominium settings struggle to respond effectively to contemporary residential needs. This diagnostic perspective provides the necessary foundation for Chapter “5. *Digitalization as a driver of change in the condominium context*”, which will investigate how digitalization and PropTech solutions can act as enabling tools to address the identified challenges, enhance coordination among stakeholders, and support a more efficient, transparent, and participatory model of condominium governance.

4.1 The Condominium in the Italian Context: Features and Evolution

The condominium represents one of the most widespread and distinctive housing forms within the Italian real estate landscape, playing a central role not only in the urban fabric but also in the country’s social and economic dynamics. With more than 50% of the Italian population living in condominiums, this model constitutes a structural element of the residential market while also embodying a context of considerable legal and managerial complexity (Consiglio Nazionale del Notariato, 2025).

Analyzing the condominium requires a multidimensional approach: on the one hand, it is essential to clarify its legal definition and the Italian regulatory framework that governs its functioning; on the other, it is necessary to examine its quantitative significance and qualitative features, such as average size, construction period, and energy performance levels. Alongside these aspects lies the social dimension, where the condominium is not only a living space but also a microcosm of relationships, cooperation, and conflict.

In recent years, the concept of the condominium has been evolving: digitalization, new models of co-living, and growing attention to energy sustainability are driving the emergence of innovative housing solutions that integrate additional services and shared spaces. These transformations, together with

the challenges posed by an aging building stock and the need for more efficient management, make the condominium a particularly relevant field of investigation, where criticalities and opportunities are deeply intertwined.

The aim of this chapter is therefore to provide a comprehensive overview of the condominium in Italy, moving from its legal framework to its quantitative and qualitative characteristics, and then to its evolution towards innovative models. This analysis highlights the main challenges and emerging opportunities, offering a solid basis for understanding the condominium's role within the broader context of the real estate sector and its ongoing digital transformation.

4.1.1 Definition and Regulatory Framework

4.1.1.1 Legal definition and essential requirements

The term condominium derives from the Latin *condominium* and literally means "joint ownership." The etymology (from *con* - + *dominium*) in fact refers to "sharing the domain," or the right of ownership exercised jointly by multiple parties (Treccani).

One of the distinguishing features of condominiums compared to other forms of ownership is the coexistence of individual spaces (exclusively owned real estate units) and common spaces shared by the various condominium owners. By extension, the term is often used to refer not only to the legal entity, but also to the building itself and the services associated with it.

In this sense, two perspectives can be identified:

- a building, referring to the physical structure and services of the building;
- a legal one, which concerns the *condominium institution* as regulated by our law.

It should be noted that the Civil Code does not provide an express definition of "condominium." The reference provision is Article 1117 of the Civil Code, which lists the common areas of the building, implicitly clarifying that in a condominium, individual properties are accompanied by assets and spaces for collective use (Studio Legale Di Sanza).

As reported by the National Association of Condominium and Real Estate Administrators (ANACI) and the National Council of Notaries (ANACI & Consiglio Nazionale del Notariato, 2023a), a condominium is established whenever several real estate units (or several buildings) have some parts in common, which may be:

- a. parts necessary for the very existence of the building (soil, foundations, load-bearing walls, pillars, beams, roofs, stairs, entrance doors, vestibules, courtyards, facades, etc.);
- b. instrumental parts for a better use of the condominium and the services offered (areas intended for parking, concierge, laundry, drying rooms, attics, etc.);
- c. works and systems that serve as common use and enjoyment (elevators, wells, sewers, gas distribution systems, electricity, heating and air conditioning, radio and television reception and information flow systems up to the point of branching off to individually owned premises, etc.).

As mentioned previously, a condominium is a particular form of joint ownership in which individual condominium owners coexist with joint ownership of the common condominium areas. Therefore, two "elements" are necessary for a "condominium" to exist:

- the existence of “common areas” serving multiple real estate units or multiple buildings or multiple condominiums;
- the existence of multiple owners, i.e., owners of individual real estate units or buildings.

The condominium, therefore, is nothing other than a particular form of joint ownership, characterized by the coexistence of common parts and parts of exclusive ownership, linked to each other by a relationship of functional and instrumental accessoryness: in this sense, the common goods must serve the enjoyment of the individual parts of the building and be necessary for its existence, as they are intended for the use and enjoyment of all the joint owners (Studio Legale Di Sanza).

According to what was reported by ANACI and the National Council of Notaries (ANACI & Consiglio Nazionale del Notariato), the regulation applies to various situations:

- Vertical condominium: this is the “classic” type of condominium, i.e. the case of vertically developed buildings with overlapping units;
- horizontal condominium: this is the case of multiple buildings (e.g. single-family homes) that share a series of works and/or areas separate from the individual buildings but intended to serve them;
- Supercondominium: this is the case of multiple condominium buildings or multiple single condominium buildings with a shared series of works, systems, and/or areas separate from the individual buildings but intended to serve them and the individual units that comprise them;
- Partial condominium: when within the same building, some common areas or services belong only to certain real estate units, with different thousandths distributions depending on the common asset or service (Article 1123, paragraph 3, of the Civil Code); therefore, only the owners of these units will be required to make decisions regarding these common areas or services and bear the related costs.

The condominium rules apply to all these cases, which are configured regardless of the completion of any formal act, such as the approval of a regulation and its validity, but by the sole fact of the existence of a building divided into distinct properties (at least two) that share common goods and/or services, permanently intended for the use and enjoyment of the entire building or part of it (Studio Legale Di Sanza).

In the national context, condominiums do not possess an autonomous legal personality, which instead remains the responsibility of the individual condominium owners (“*Condòmini*”) ⁷. Their creation occurs ipso iure et facto, that is, automatically and without the need for a formal deed, when a single-ownership building is transferred to multiple parties. The condominium is therefore configured as a “legal institution” ⁸ and, at the same time, as a management entity acting in the common interest of the participants (A.R.A.I.).

Management is entrusted to two main bodies:

- the administrator, who represents the institution externally and carries out decisions;

⁷“*Condòmini*” are the owners of the property. If there are two (or more) co-owners of the property, such as a spouse, they are considered a single condominium owner; if multiple real estate units are owned by a single person, they are also considered a single condominium owner .

⁸By *legal institution* we mean “A set of principles and norms that regulate a given social phenomenon (and also the phenomenon itself insofar as it is regulated by such norms); a phenomenon that is not identified with a person, physical or legal, nor with a plurality of persons, but rather with a relationship or a series of legal relationships between various subjects”.

- the condominium assembly, which constitutes the decision-making body and establishes the operating rules through majority resolutions. Voting can be based on the number of attendees or on the so-called thousandths of ownership, which are shares proportional to the cadastral value of the individual units. The thousandths, reported in the thousandths table, do not create new rights but rather arithmetically represent existing ones.

It is important to emphasize that the condominium assembly is the primary decision-making body for the management of common areas and for financial and strategic decisions affecting the building. It can be convened in an ordinary session, with an agenda partly established by law (Article 1135 of the Civil Code), or in an extraordinary session to discuss specific issues at the request of the administrator or the condominium owners. The owners of the property units participate with voting rights, directly or by proxy, and the failure to convene even by a single entitled party results in the annulment of the decisions adopted (Gallucci, 2019a). Its main functions include the approval of the budget and final accounts, the definition and allocation of expenses, decisions on extraordinary maintenance interventions, the adoption of innovations, and the possible appointment or dismissal of the administrator. The assembly therefore represents the institutional forum where the needs, expectations, and priorities of the condominium's various residents are discussed.

Another fundamental instrument is the condominium regulations, similar to a bylaw. They govern the use of common areas and cohabitation between condominium owners; they are mandatory in buildings with more than ten residents and can be approved by the assembly (assembly regulations) or prepared by the builder and filed with a notary (contractual regulations) (A.R.A.I.).

Application issues are not lacking. In some cases, the term "condominium without condominium" (*"edificio in condominio senza condominio"*) is used to describe situations in which, despite there being multiple owners (and thus a de facto condominium), the legal requirements, such as registration in the condominium registry or the appointment of an administrator, are not fulfilled. The latter is mandatory only for condominiums with more than eight owners, but its absence leaves the condominium without formal representation, with tax implications. This creates a true paradox: the condominium exists de facto, but not de jure (Sabin, 2019).

A condominium is not limited to the legal definition of multiple exclusive properties coexisting within a single building, but also takes the form of a physical and functional organism, composed of private real estate units and the spaces and services connected to them.

Alongside individual properties, common spaces are an essential element: they serve primarily an instrumental function, enabling the use and full enjoyment of exclusive areas (think stairways, elevators, or utilities). At the same time, they serve a relational function, providing places for interaction between condominium members, such as courtyards, hallways, and internal gardens. Added to these are any accessory spaces, such as garages, green spaces, or recreational areas, which expand the possibilities for use and contribute to the quality of life in the condominium. In this dual dimension, the condominium is therefore presented not simply as a collection of real estate units, but as an organized microcosm of shared spaces, relationships, and services.

In short, a condominium can be understood not only as a collection of private real estate units within a building, but also as a complex system of common spaces and services that ensure its functionality and foster relationships among residents. The dual nature of condominiums - material and social - highlights how the quality of living depends not only on exclusive ownership, but also on the management and organization of shared areas, which are increasingly strategic in condominium life. This integrated vision introduces the need for a clear and structured regulatory framework capable of regulating the

coexistence of individual and collective rights, ensuring a balance between private property, shared use, and new housing needs.

4.1.1.2 Reference legislation and condominium reform (Law 220/2012)

The condominium, as a legal institution and form of shared living, is governed by a complex regulatory framework based on the Civil Code (Articles 1117–1139 of the Civil Code) and its implementing provisions (Articles 61–72 of the Civil Code implementing provisions). These general rules are complemented by specific provisions that significantly impact condominium life, such as those regarding the safety of systems, the elimination of architectural barriers, and the energy efficiency of buildings.

For a long time, this legislation remained essentially unchanged from its original 1942 incarnation, proving increasingly inadequate in the face of the profound social, economic, and technological changes affecting the housing sector. New forms of cohabitation, growing litigation among condominium owners, the need for management transparency, and the emergence of issues related to energy and sustainability have made reform inevitable.

Law No. 220 of 11 December 2012 ("*Modifiche alla disciplina del condominio negli edifici*"), which came into force in June 2013, represented the most significant regulatory update in this area, introducing significant innovations: from the strengthening of the role and responsibilities of the administrator to the expansion of the powers of the assembly, from more specific regulations on common systems and technological innovations to greater transparency in accounting and expenditure management.

While the reform improved several practical aspects of condominium life, it did not resolve all the critical issues, leaving open scope for intervention that the legislator has partially filled with subsequent measures, such as those related to building bonuses and the regulation of so-called supercondominiums. In this sense, the 2012 reform can be seen as a key step in the modernization of condominium law, but not as a definitive end point.

The latest update presents an updated text pursuant to Law No. 220 of 11 December 2012 with the changes introduced by Legislative Decree No. 145 of 23/12/2013 (converted into Law No. 9 of 21 February 2014) and by Legislative Decree No. 149/2022 (the so-called *Riforma Cartabia*).

Although condominiums present numerous legal and interpretative implications, this thesis has chosen to address only the fundamental and most relevant aspects to outline the relevant regulatory framework. Therefore, this discussion does not claim to be legally exhaustive, nor does it intend to delve into the technical intricacies of condominium law, a discipline that would require specific legal expertise. The more limited but effective objective is to provide a concise and clear overview of the definitions and constituent elements that govern condominium life, thus paving the way for regulatory analysis and subsequent reflections on the evolution of condominium models.

Basic regulatory framework

The regulation of condominiums finds its main foundation in the Italian Civil Code, which came into force in 1942. In particular, Book III, Title VII, dedicated to co-ownership, contains rules that also apply to condominiums, which can be considered a particular form of co-ownership in which individual properties (the real estate units of each condominium owner) and common properties (the indivisible parts of the building) coexist (Cusano, 2024).

Articles 1117–1139 of the Italian Civil Code specifically regulate condominium ownership in buildings. For example, Article 1117 of the Italian Civil Code identifies the common areas of the building (such as the roof, stairs, facades, and courtyards), while subsequent provisions regulate the functioning of the condominium assembly, the duties and responsibilities of the administrator, and the criteria for allocating expenses. These provisions are complemented by Articles 61–72 of the Implementing Provisions of the Italian Civil Code, which integrate and specify further practical aspects of condominium management. Furthermore, certain provisions on general joint ownership (Articles 1100–1116 of the Italian Civil Code) and those relating to mandate (Articles 1703–1730 of the Italian Civil Code) also apply to condominiums. A significant example is Article 1117 of the Italian Civil Code, 1102 of the Civil Code, which allows each condominium owner to use the common assets for personal purposes, provided that their intended use is not altered and that the rights of others are not limited (ANACI).

This regulatory framework has served as the legal basis for condominium life for over seventy years, defining the rights and duties of condominium owners, as well as the methods of use and management of common areas. However, having been conceived in a historical context very different from today's, it has not always responded to the needs of contemporary condominium living, characterized by greater social, technological, and economic complexity.

Condominium regulations can be traced back to two dimensions:

- The static part, which concerns the ownership and use of common areas. It establishes the rights and obligations of the condominium owners as they exist at the time of purchase of the real estate units, creating a balanced situation that can only be changed by unanimous agreement of all participants.
- The dynamic part, which concerns the management of common areas. This is where the condominium bodies (assembly and administrator) intervene, regulating condominium life through resolutions and deeds. It is important to emphasize that these deeds cannot affect the fundamental rights enshrined in the static part.

Alongside these provisions, there are also special regulations that have emerged over time, arising from the need to regulate areas not covered by the original code, but which directly impact condominium management and building safety. Among these are the provisions regarding system safety, such as Ministerial Decree 37/2008, which regulates the installation and maintenance of technological systems, as well as the regulations for the elimination of architectural barriers, introduced by Law 13/1989, and the provisions on the energy efficiency of buildings, from Law 10/1991 to the more recent Legislative Decree 192/2005 and subsequent amendments, the result of a series of legislative measures geared towards environmental sustainability and implementing European directives on the energy performance of buildings (APE - Energy Performance Indicators, minimum requirements, and energy saving incentives).

The presence of such special rules underscores the need to integrate simple civil law regulations with broader technical and social dimensions, which ensure safe, accessible, and energy-efficient buildings.

Context of the reform

The 1942 Civil Code, while an important landmark, has, over the decades, revealed numerous limitations and inadequacies in addressing the modern needs of condominiums. First, the growing complexity of building structures and the multiplicity of interests involved have necessitated a more comprehensive and flexible framework. Contemporary condominium buildings, often consisting of hundreds of units, present challenges that far exceed those imagined in the post-World War II era. Thus,

the need for a regulatory update has arisen to adapt existing regulations to the technological, architectural, and social changes that have occurred.

At the same time, condominium life has become more conflictual, with an increase in disputes and tensions among condominium members, partly due to management that is not always transparent or balanced. This situation has generated strong social pressure for regulatory interventions capable of introducing more rigorous standards of transparency, accountability, and participation. Furthermore, new forms of housing and collective management have emerged, including so-called "*supercondomini*," which require comprehensive and updated rules to ensure harmonious coexistence. In short, it can be said that the 2012 reform stems from a combination of technical, social, and cultural factors that have highlighted the obsolescence of the previous legislation.

Main innovations of Law 220/2012

As previously explained, Law No. 220 of 2012, commonly referred to as the "*Riforma del Condominio*," represents the most significant legislative intervention in this area since the 1942 Civil Code. After more than seventy years of substantial legislative stagnation, the reform introduced a series of innovations aimed at modernizing condominium regulations, adapting them to the social, economic, and technological transformations of contemporary society.

One of the key aspects of the law concerns the role of the condominium administrator, recognized as a key element in condominium life. The reform introduced more stringent requirements for their position: in addition to enjoying full civil rights and not having serious criminal convictions, the administrator must possess specific professional and educational qualifications, including a high school diploma and completion of an initial training course, with mandatory annual refresher courses (Article 71-bis of the implementing provisions of the Civil Code). This regulatory choice responds to the need to ensure management is entrusted to competent and responsible individuals, reducing the risks associated with improvisation and lack of transparency (Redazione BL Servizi, 2025).

At the same time, the law strengthened the role of the condominium assembly, expanding its decision-making powers and introducing new rules for convening and deliberating. The goal was to encourage broader and more informed participation among condominium owners and, at the same time, to make decision-making processes clearer and faster, reducing the scope for conflicting interpretations.

Another important chapter of the reform concerns shared facilities. The law includes specific rules for the installation and management of facilities intended for collective use, such as centralized antennas, parking lots, and especially renewable energy infrastructure (e.g., photovoltaic panels). In this way, the legislator intended to encourage the spread of technological and sustainable solutions, in line with European directives on energy efficiency and environmental protection (Redazione BL Servizi, 2025).

The reform also revised the rules governing condominium fees and thousandths tables, essential tools for the fair distribution of costs among condominium owners. Greater clarity has been established in the drafting and updating criteria, thus reducing disputes and ensuring more balanced management of financial resources.

Finally, one of the most innovative aspects introduced by Law 220/2012 concerns the promotion of management transparency within condominiums. The reform mandated the use of a current account in the condominium's name, through which all incoming and outgoing transactions must be recorded, thus ensuring the traceability of transactions. Furthermore, specific mandatory registers must be

maintained: the accounting register, the register of meeting minutes, and the condominium registry, essential tools for ensuring orderly and verifiable archiving of documentation (Redazione BL Servizi, 2025).

A further innovation is the possibility, approved by the assembly, of activating a condominium portal or website. This is not limited to a proprietary domain, but can also consist of platforms provided by third parties: the goal is to make accounting data, meeting minutes, and any other relevant communications digitally accessible. Essentially, the law grants the assembly the power to choose the adoption of IT tools that promote transparency, information sharing, and rapid communication between the administrator and condominium owners. Once the portal has been approved, it is the administrator's responsibility to activate it, keep it updated, and manage its content. The associated activation and management costs are borne by the condominium owners, divided according to the thousandths criterion (Danea, 2023).

Generally, the condominium portal is organized into two sections: a private section, accessible only by individual condominium members to view documents and personal communications, and a shared section, accessible to all eligible owners, where shared data is uploaded. To support formal communications, the reform also provides the option of activating a mailbox. Certified Electronic Mail (PEC) for each condominium owner, thus making the exchange of official communications more secure and legitimate (Sabin, 2019).

However, the use of these tools requires proper privacy protection and secure management of personal data. For this reason, the operation of condominium portals and digital systems must comply with the guidelines set forth in the European General Data Protection Regulation (EU No. 2016/679, GDPR), for example by clearly distinguishing between data accessible to everyone and data for the exclusive use of individual condominium owners.

Overall, these tools help strengthen condominium owners' control over management; ensure greater financial traceability; establish a relationship of trust and transparency with the administrator; and encourage the digitalization of condominium life.

From this perspective, the legislation does not simply impose obligations, but also encourages the adoption of innovative technological solutions, fostering the development of dedicated software platforms and promoting the transition towards increasingly "smart" condominiums, capable of integrating transparency, efficiency, and management sustainability.

Impact of the reform

Law 220/2012 represented a fundamental step towards the modernization of condominium life, introducing rules more in line with contemporary social and economic reality. The reform contributed to improving the day-to-day management of condominiums, strengthening administrative transparency and increasing the accountability of administrators. It also simplified approval procedures for improvements and encouraged greater attention to energy efficiency and environmental sustainability, aspects that until then had received marginal regulatory attention (Redazione BL Servizi, 2025).

Despite progress, the reform's concrete impact has been limited. Implementation of the new provisions has been uneven across the country, often hampered by practical difficulties and entrenched practices that are difficult to overcome. The very complexity of condominium law, combined with the multiplicity of interests involved, has prevented full uniformity in management and interpretation. Critical issues still persist in sensitive areas, such as the composition and functioning of meetings, the management

of conflicts between condominium owners, and the effective implementation of transparency obligations by administrators (Associazione Culturale Prospettive Mediterranee).

Nonetheless, the 2012 reform marked an important starting point. It spurred a process of progressive legislative updating, geared towards addressing new challenges. Subsequent regulatory interventions followed this path, introducing innovative tools such as building bonuses (particularly the 110% Superbonus) to promote extraordinary maintenance and energy efficiency upgrades of condominium buildings. At the same time, the concept of supercondominiums was legally recognized, designed to more efficiently manage complex real estate projects consisting of multiple buildings and shared services.

These developments confirm that condominiums are now recognized not just as static structures, but as dynamic organisms, capable of adapting to social, economic, and environmental changes. Law 220/2012, while not a definitive reform, has laid the foundation for a path of continuous regulatory evolution.

Ultimately, Law 220/2012 represents a fundamental step in the modernization of Italian condominium life. This reform updated and integrated an outdated regulatory framework, introducing innovative principles in terms of organization, accountability, and transparency - essential elements for more balanced coexistence and more effective building management. However, it cannot be considered a definitive end point: the practical issues and complexity of the subject matter require further refinement of the regulation, which is being achieved through subsequent legislative initiatives and ongoing interpretative development. In this sense, the 2012 reform represents a crucial, yet partial, step in the long journey toward a regulation that fully meets the needs of collective living and management in condominiums.

4.1.2 Number of Condominiums in Italy and Territorial Distribution

According to recent estimates (ANACI & Consiglio Nazionale del Notariato), there are over 1.2 million registered condominiums in Italy, buildings composed of multiple units and distinct legal entities with a single tax code. However, this number is believed to be underestimated and that the number is actually much higher. It is estimated that over 14 million Italian families, equal to approximately 45 million people - that is, three out of four citizens - live in a condominium, confirming the predominant role of this type of housing in the country.⁹

The concentration of condominiums is particularly significant in large cities: Milan, Rome, Turin, and Naples together have approximately 27 million housing units located within condominiums, while in rural areas and small towns, single-family homes still prevail. Furthermore, in some regions of Northern Italy, courtyard dwellings also fall under condominium regulations, contributing to specific forms of shared living (Banca del Piemonte, 2023).

At a regional level, Lombardy stands out for its highest incidence of condominiums, both in terms of the number of buildings (17%) and housing units (18.3%). Lazio follows, with 9.9% of condominium buildings and 11.9% of housing units, and Campania with approximately 8.4%. Emilia-Romagna, Piedmont, and Veneto complete the ranking, regions where a further significant portion of Italian

⁹ A small clarification is in order: searching online will reveal widely differing opinions regarding the actual number of people living in condominiums. This is because ISTAT, the only agency that reports the precise number of residents, families, and dwellings in our country, does not provide precise data on the number of people living in condominiums. Therefore, we used the data provided by ANACI estimates.

condominiums are concentrated. These areas collectively represent more than 30% of buildings and a massive concentration of housing within condominiums (*Figure 48*) (Della Puppa, 2019).

	Condomini	Unità residenziali
Piemonte	7,7	8,9
Valle d'Aosta	0,4	0,3
Lombardia	17,0	18,3
Trentino-Alto Adige	1,9	1,7
Veneto	7,0	5,7
Friuli-Venezia Giulia	2,2	2,1
Liguria	4,4	5,5
Emilia-Romagna	8,5	7,6
Toscana	7,0	5,9
Umbria	1,2	1,0
Marche	2,6	2,1
Lazio	9,9	11,9
Abruzzo	2,0	1,9
Molise	0,4	0,4
Campania	8,4	8,6
Puglia	6,1	6,0
Basilicata	0,8	0,7
Calabria	3,4	2,8
Sicilia	6,9	6,8
Sardegna	2,1	1,9
Italia	100,0	100,0

Figure 49: Distribution of condominiums in Italy by region in % terms. Source: Della Puppa, 2019

In total, approximately 14.5 million buildings are registered in Italy, of which over 1.2 million are condominiums, comprising 27 million housing units. Of these, approximately 14.3 million are used for residential purposes and house the majority of families, while the remainder is used for commercial, office, or other purposes (Della Puppa, 2019).

These data portray a housing context profoundly influenced by the presence of condominiums, especially in metropolitan areas, where cohabitation and shared management play a central role in the daily lives of a large portion of the Italian population.

4.1.3 Structural Characteristics of Condominiums

4.1.3.1 Average size and number of real estate units

According to the 2006 CENSIS – ANACI report (ANACI & Censis Servizi, 2006) regarding the estimate of the number of condominiums and dwellings per building, an Italian condominium has an average of 5-8 housing units, although in densely populated urban areas, buildings with more than 16 units are common. No condominium forms were calculated for rural dwellings or for buildings with fewer than 2 dwellings (*Figure 49*). The assets estimated as non-condominium are therefore represented:

- Single and semi-detached houses;
- From buildings below the minimum condominium legal standard;
- From buildings potentially owned by a single owner, be they natural persons or legal entities.

N. Di abitazioni dell'edificio	N. Edifici ad uso abitativo censimento 2001	CONDOMINI		FAMIGLIE		ABITAZIONI	
		Quota stimata di edifici in condominio	Numero stimato di condomini	N. Di famiglie in abitazioni in edifici ad uso abitativo censimento 2001	Numero stimato di famiglie in condomini	N. Di abitazioni in edifici ad uso abitativo censimento 2001	Numero stimato di abitazioni in condomini
3 o 4	1031757	10%	103.176	2.802.082	280.208	3.478.593	347.859
Da 5 a 8	517100	75%	387.825	2.629.083	1.971.812	3.223.761	2.417.821
Da 9 a 15	275263	90%	247.737	2.605.043	2.344.539	3.117.717	2.805.945
16 e più	207333	95%	196.966	5.021.244	4.770.182	5.985.865	5.686.572
Totale	2031453	-	935.704	13.057.452	9.366.741	15.805.936	11.258.197

Figure 50: Estimated number of condominiums, families and dwellings per number of dwellings in the building. Source: ANACI & Censis Servizi, 2006

Geographically, Northern Italy has a greater concentration of large condominiums, built during the economic boom, while smaller, more recently constructed condominiums are more common in the South. Size is a crucial factor not only from a construction perspective, but also from a management perspective: the greater the number of units, the greater the administrative complexity and the potential for conflict between condominium owners.

4.1.3.2 Construction period and energy performance

Most of Italy's condominiums date back to the 1950s to the 1980s, the years of the construction boom. These buildings represent a significant portion of the condominium population and today present structural, energy, and safety issues, linked both to aging materials and the lack of modern construction criteria (insulation, efficient systems) . In the last twenty years, however, a smaller share of new construction has been recorded, often characterized by higher standards of efficiency and comfort, but numerically limited. However, considering the growing trend of urbanization, as analyzed in the first chapter, and the growing importance of reducing land consumption, the vertical expansion of housing remains the only option for meeting the needs of metropolitan cities. Consequently, it is clear that a growing number of people will live or already live in condominiums, making this housing model increasingly central to Italian urban dynamics.

When analyzing condominiums from an energy perspective, we lack reliable and complete data regarding the number of housing units or the number of condominiums distributed by energy class. However, thanks to the introduction of the *Attestato di Prestazione Energetica* (APE), required by Legislative Decree 192/2005 and made mandatory for sales and rentals, it has been possible to map the energy performance of the Italian building stock in more detail. In this context, condominiums also exhibit a trend consistent with that of the overall residential housing stock.

As analysed in paragraph 2.2.1.3 *Building Age and Energy Performance*, the most recent ENEA data highlight how 74.1% of Italian buildings fall into the least efficient energy classes, i.e. E, F and G, while only 8.1% are attributable to the highest performing classes, from A1 to A4.

This situation reflects the age of residential construction: 82% of condominiums, in fact, were built before the entry into force of Law 10/1991, which introduced the first constraints on the energy efficiency of buildings (Banca del Piemonte, 2023).

In recent years, tax incentives such as the Ecobonus and the 110% Superbonus have provided a significant boost to energy efficiency, primarily in condominiums. Despite this, the uptake of energy efficiency interventions remains limited compared to the vast existing building stock, and the results achieved are currently insufficient to significantly change the overall picture.

For 2025, European and national regulations require further stringent updates to energy efficiency ratings for buildings, with the goal of reducing average energy consumption within the next few years, in line with the EU Green Homes Directive. By 2028, all new public buildings will be required to be zero-emission, a requirement that will be extended to private buildings starting in 2030. Therefore, these provisions will significantly boost the energy transition in the building sector, requiring effective coordination between legislators, businesses, condominium administrators, and citizens to achieve the European Union's climate-neutrality and sustainability goals.

4.1.4 Social and Cultural Aspects of Condominium Life

A condominium is not simply a collection of residential units, but represents a true space for coexistence, where private and common spaces are constantly intertwined. In this context, social relationships develop that can oscillate between cooperation and conflict. The main sources of tension between condominium owners often concern the division of expenses, the use of common areas, disturbing noises, or the presence of pets (ANACI & Censis Servizi, 2009). Alongside these critical issues, however, condominiums are also a place of spontaneous solidarity and mutual support, especially where neighborly relationships are consolidated over time or in neighborhoods characterized by a strong sense of community.

The condominium can therefore be interpreted as a social microcosm, capable of reflecting on a smaller scale the transformations of contemporary Italian society. Among the most evident dynamics, analyzed in the first two chapters of this thesis, are the aging population, the growing presence of foreign families, and the emergence of new forms of housing, such as shared living for students, singles, or co-living models. These changes introduce new management needs, ranging from accessibility for the elderly or those with disabilities to the creation of multifunctional common spaces and the adoption of digital tools for communication and administration.

At the heart of condominium life remains one essential element: coexistence. Physical proximity and the sharing of goods and services lead to frequent interactions, both related to natural socialization and the need to collectively manage spaces and responsibilities. Even when relationships between neighbors are distant, dialogue remains essential, especially when it comes to decisions regarding the management of common property.

Sharing, however, goes beyond the practical use of common spaces. Condominium owners share a broader goal: ensuring individual and collective well-being through the care of individual units and the entire building. In this sense, the condominium can be considered a true organization, understood as a coordinated set of people, resources, and rules aimed at pursuing a common goal. Managing condominium life therefore requires coordination, active participation, and a constant balance between individual and collective interests

4.1.5 Towards the Service Condominium: Common Spaces and Shared Functions

In recent years, the Italian condominium has undergone a profound transformation: from a simple collection of residential units, it is evolving into a true multifunctional residential community. The building is no longer seen merely as a private space, but as an ecosystem integrating shared services, technologies, and common areas designed for the collective well-being and quality of life of residents (Redazione Condominio Caffè, 2025).

This evolution is particularly evident in the growing offering of new condominium services, often accessible through subscription plans. Alongside traditional common areas, condominiums now offer innovative spaces such as co-working spaces, urban gardens, gyms, shared libraries, and multipurpose rooms for events or meetings. These are complemented by personalized services such as shared home care, pet-friendly areas, concierge services, and integrated security systems.

The introduction of these services marks the transition to a new housing model, one that values shared spaces as places for socializing and supporting daily life. Born and consolidated in the luxury segment, this model is rapidly expanding to a more diverse audience, responding to the new expectations of families, singles, students, and multiethnic communities. The home of the future will be smaller but enriched with a superior range of shared services, promoting a new form of living based on the quality of space and social relationships (Voci, 2022).

However, integrating these services inevitably leads to increased management and maintenance costs. The complexity of the systems, the need for specialized personnel, and the ongoing maintenance of common areas significantly impact condominium fees. For an average condominium consisting of thirty apartments, the average cost of ordinary maintenance (which includes cleaning, gardening, management of systems, and common services) is around €20,000, to be divided among the condominium members based on their ownership interest (Edilnet). The amount varies depending on the size and type of building, its construction period, its geographic location, and, above all, the variety of services offered. To contain costs without sacrificing quality, careful management and optimization of service contracts, supported by digital tools for monitoring and planning, are therefore essential.

The so-called "service condominium" model represents a new dimension of contemporary living, enhancing shared spaces as places for socialization, support, and well-being. This approach responds to diverse needs, such as work-life balance, new forms of co-living, and social inclusion. Beyond the social benefits, this evolution also leads to an increase in the economic value of properties. Recent studies estimate that a condominium equipped with innovative and sustainable services can be worth up to 25% more than traditional buildings (Redazione Condominio Caffè, 2025).

Finally, according to the 2025 trends analyzed by Very Fast People (Redazione VeryFastPeople, 2025), modern condominiums are increasingly characterized by an interconnection between sustainability, technological innovation, and personalized services, integrating digital solutions such as automation systems, intelligent energy management, and digital platforms to facilitate communication and participation among condominium members. These elements transform condominiums into dynamic environments, open to change and focused on the quality of life of their residents, with a positive impact on management efficiency and long-term costs. This topic will be explored in greater depth in Chapter "5. *Digitalization as a driver of change in the condominium context*", which will be specifically dedicated to the digital dimension: the technological solutions most widely adopted in condominium management will be analyzed, with a focus on communication platforms, document management software, electronic payment systems, and predictive maintenance applications. As service

condominiums require more professional, forward-thinking, and informed management, capable of balancing spatial quality, technological innovation, and economic sustainability, they can provide an effective and lasting response to the new housing and social needs of contemporary cities. Digital technologies may accelerate this transformation facilitating the transformation of condominium dynamics, simplifying processes, reducing conflict, and redefining relationships between stakeholders, with a growing impact on both efficiency and the quality of daily life.

4.1.6 Opportunities and Challenges in the Condominium Context

In this context, condominium emerges as a multi-actor system in which legislative, organizational, social, and, looking ahead, technological aspects are intertwined. It is characterized by fragmented governance structures and increasing organizational complexity due to its collective nature and the several interests involved. Looking at the condominium as a system make visible some challenges and opportunities, represented in *Diagram 3*.

As explained in the chapter, the coexistence of private units and common parts within a fragmented and evolving regulatory framework generates high legal and managerial complexity, which is further exacerbated in “condominium without condominium” situations where formal registration, representation mechanisms and the role of the administrator remain weak or absent. At the same time, it has become clear that a large share of the building stock is both ageing and energy-inefficient, implying that many condominiums face costly interventions precisely in contexts where decision-making is slow, responsibilities are diffused and socio-economic conditions can limit the capacity to invest. These structural features tend to increase coordination burdens and conflict risks, particularly in larger condominiums, where the number of units, actors and shared services amplifies the difficulty of reaching collective decisions and managing everyday operations.

Yet, this same configuration also opens up specific opportunities. Updated legal frameworks and sectoral regulations provide a clearer basis for standardizing procedures and professionalizing condominium management, supporting a gradual transition from informal arrangements to more structured governance models. National and European incentives for energy efficiency and building retrofits create windows of opportunity to address the ageing stock, reduce consumption and improve comfort and property values. The adoption of advanced organizational forms can enable economies of scale in the management of complex assets and shared services, making it easier to coordinate interventions and negotiate with external providers. Finally, recognizing condominiums as social microcosms rather than merely legal entity highlights their potential to foster cooperation, mutual support and community building, especially when governance arrangements and shared spaces are intentionally leveraged to strengthen relations with neighbors.

In conclusion, the analysis highlights how structural fragmentation, regulatory complexity, and limited coordination mechanisms generate recurring inefficiencies, while at the same time revealing opportunities for more structured approaches to coordination, transparency, and long-term management of residential assets.

4.1 CHALLENGES AND OPPORTUNITIES RELATED TO THE CONDOMINIUM AS A SYSTEM

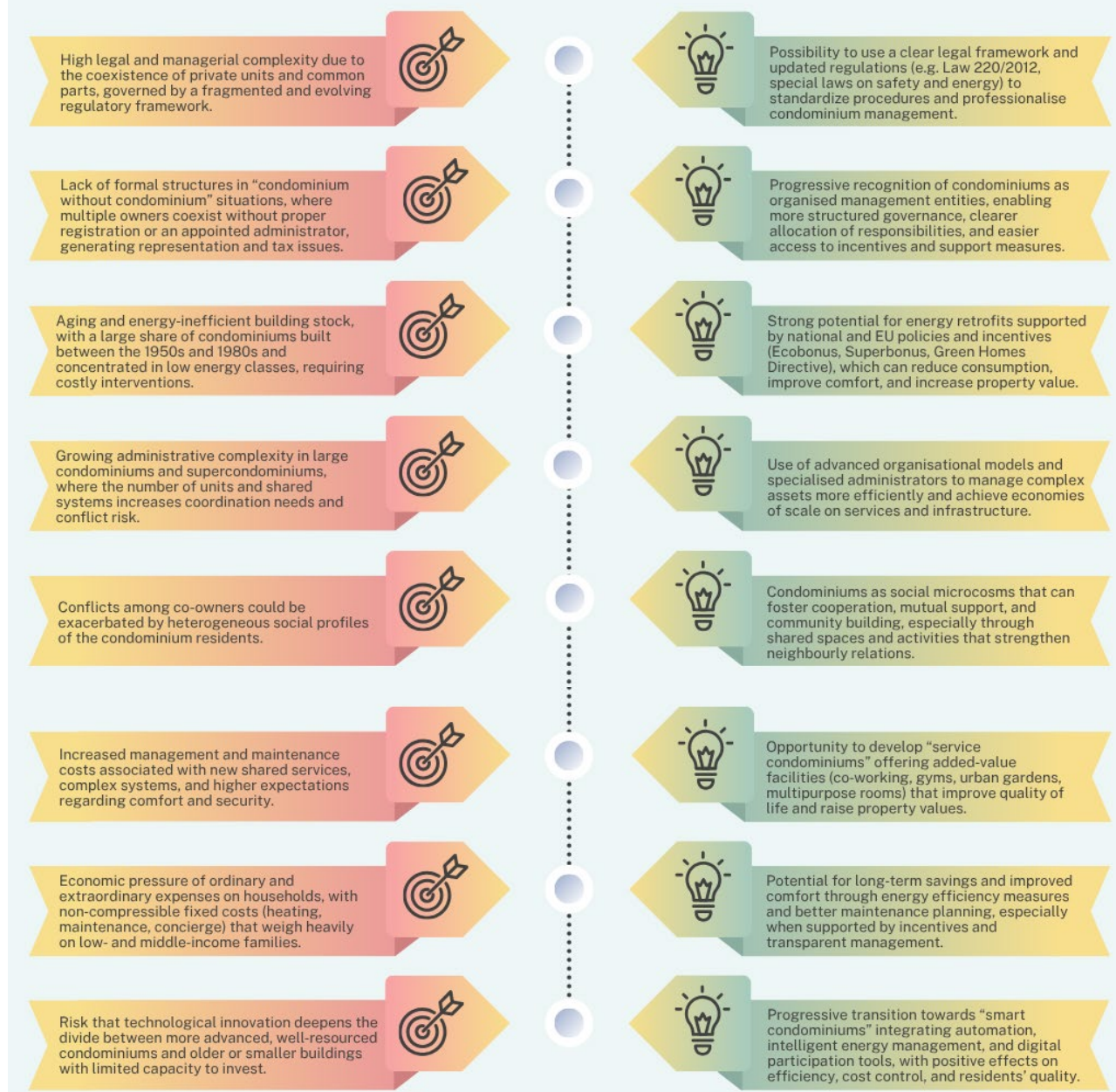


Diagram 3: Main challenges and opportunities related to the condominium as a system. Source: Own Elaboration

As the discussion continues, the analysis will shift to the three main figures that revolve around the condominium: the condominium owners/tenants, who are the direct protagonists of condominium life and bearers of needs, conflicts, and expectations for improved living quality; the condominium administrator, a key player in condominium governance and guarantor of proper management; and the service providers, who represent the operational framework through which maintenance, innovation, and efficiency are achieved.

4.2 Tenants and Owners: Needs, Expectations, Critical Issues

In the previous chapter, the condominium has been presented as a legal and organizational entity, with its structural framework, governance mechanisms, and regulatory references. However, beyond the normative and managerial dimension, the condominium is first and foremost a living environment, inhabited by individuals and households of different ages, ethnicities, and social classes. Within this context, tenants and owners represent the main actors whose experiences and interactions shape the daily functioning of the building community.

This chapter aims to deepen the analysis by shifting the focus from the institutional and legal aspects to the perspective of residents. The objective is to explore their needs, expectations, and critical issues, highlighting social, economic, and managerial dimensions of condominium life. On one side, aspects such as community relations, cooperation, and potential conflicts emerge; on the other, financial burdens, disparities in resources, and challenges related to maintenance and innovation.

By analyzing these elements, the chapter seeks to identify the main opportunities and, above all, the challenges that tenants and owners face in the contemporary residential context. This perspective provides the foundation for understanding how the management of condominiums can evolve to better respond to residents' requirements, paving the way for innovative solutions and improved models of cohabitation.

4.2.1 Residents of the Condominium: Owners and Tenants

As highlighted in previous chapters, a condominium is not just a legal and management entity, but above all a place inhabited by people with different roles and perspectives. Within this context, it is essential to distinguish between owners (co-owners) and tenants (lessors or lessees), two categories that share the same physical space but have partially divergent interests, rights, and duties.

A condominium owner is the owner of a real estate unit, or someone who holds a real right of enjoyment over the property. Ownership of a property or portion of a building that confers a real right is not required. Therefore, the category of condominium owners also includes owners of shops, cellars, garages, or rooftop terraces (Bresciani, 2023). A tenant - also known as a "*conduttore*" or "*locatario*" - is the person who lives in the condominium, thus being a "*de facto*" resident, but without owning the residential unit. They occupy the property by virtue of a rental agreement with the owner (the "*locatore*," who is the "*giuridico*", *de iure*, condominium owner) or by virtue of a loan for use or usufruct. Consequently, the tenant is not a full-fledged condominium owner, and this entails significant differences in terms of rights and duties, since he only has a limited and temporary right to the property (Bresciani, 2023).

This distinction is reflected primarily in participation in condominium life. Condominium members have the right to actively participate in joint decisions: they can attend and vote in meetings, challenge resolutions in court, inspect condominium documents held by the administrator, request the convening of extraordinary meetings, and dispose of common areas, in compliance with the bylaws. Tenants, while required to comply with the bylaws and resolutions, have more limited rights. They are required to pay the owner any additional costs required by law (e.g., ordinary maintenance costs) and are free to inspect all relevant condominium documents (Articles 1129-1130-bis of the Civil Code). However, while they may in some cases participate in condominium meetings as observers or representatives of specific interests (e.g., regarding common services), they generally do not have the right to vote unless explicitly delegated by the owner or the matter in question is specifically provided for by law. The first two paragraphs of Article 1129-1130-bis of the Civil Code provide for this. Article 10 of Law No. 392/1978 establishes that the tenant has the right to vote on resolutions regarding the costs and management of

heating and air conditioning services. They may also intervene - but without the right to vote - in decisions regarding modifications to other common services (Gallucci, 2019b).

In addition to rights, duties must also be considered. The owner is directly responsible for paying condominium fees, both ordinary and extraordinary. The tenant, however, contributes only to ordinary administrative expenses (cleaning, lighting, heating, and routine maintenance), since extraordinary expenses remain the responsibility of the owner, unless otherwise contractually agreed. Furthermore, the tenant, living in a condominium, is required to comply with the condominium rules like all other residents (Bresciani, 2023). In the event of violations by the tenant, the responsibility also falls on the owner of the property, by virtue of the joint liability between the landlord and the tenant. This means that the administrator can take action against both the tenant and the owner to enforce the common rules. For example, if the tenant defaults, the administrator can seek recourse directly against the owner, who in turn can take action against the tenant as provided for in the rental agreement. Similarly, if the tenant commits infringements of the condominium regulations, the owner has the duty to intervene – even through legal action – to ensure compliance with the rules and protect the other condominium owners (Bresciani, 2023).

These differences are also reflected in time horizons and economic priorities. As discussed in previous chapters regarding ownership and rentals, homeowners tend to think long-term, as housing represents not only a consumer good but also an asset to be preserved and enhanced. Their economic priorities therefore focus on protecting and increasing property value, structural maintenance, and energy efficiency; investments that enhance the quality of life and the property's potential return. Tenants, on the other hand, are often characterized by greater housing mobility and a shorter time horizon, tied to the length of their lease. Their priorities focus on immediate costs and the quality of daily services (such as routine maintenance, running costs, and living comfort) rather than long-term interventions.

Another factor that profoundly impacts condominium life is demographics, namely the composition and diversity of residents. As discussed in previous chapters - particularly in the section dedicated to the evolution of family units and new housing models - condominium contexts also reflect ongoing societal changes, presenting an increasingly heterogeneous population. Families with children, young students, seniors, singles, and multiethnic families now coexist within the same building, shaping the condominium as a complex and constantly evolving space for coexistence (Fabbri & Bracci, 2021).

This social plurality can represent a valuable resource: the coexistence of people of different ages, cultural backgrounds, and life experiences offers opportunities for cultural and social enrichment, fostering relationships of solidarity and mutual exchange. This diversity can therefore represent a factor of social enrichment, fostering cultural exchanges and intergenerational solidarity. For example, the presence of older people can promote forms of mutual support with families, while young people can introduce innovative practices in the management of common spaces. However, this same heterogeneity can also become a source of conflict and tension, generated by differences in lifestyles, daily habits, and schedules, which are often difficult to reconcile (Fabbri & Bracci, 2021).

In contemporary urban contexts, condominiums are increasingly becoming spaces for intergenerational and intercultural coexistence. In this scenario, it is essential that the condominium management system be capable of mediating between different, sometimes even conflicting, needs and expectations, adopting intercultural mediation and communication strategies that promote mutual respect and facilitate balanced and peaceful coexistence (Fabbri & Bracci, 2021).

The distinction between owners and tenants and the growing socio-demographic diversity of residents thus outline a complex context within which the daily dynamics of condominium life unfold. These elements form the necessary basis for analyzing the key dimensions of condominium life: social,

economic, and managerial. This analysis will allow us to identify residents' needs, expectations, and critical issues in order to more deeply understand the opportunities and challenges associated with shared management of living space.

4.2.2 Social Dimension of Condominium Life

The social dimension of condominium life is crucial to understanding the dynamics that characterize multi-ownership residential buildings. As mentioned in the introduction to the relevant chapter, a condominium is not merely a physical structure or a legal-administrative entity, but also - and above all - a social microcosm in which people of different ages, origins, lifestyles, and expectations share common spaces and rules of coexistence. This uniqueness makes the condominium a place where human relationships are intertwined, giving rise to both cooperation and solidarity as well as conflict and tension.

4.2.2.1 Relations between residents: cooperation and conflicts

Cohabitation between individuals and families inevitably requires establishing forms of daily interaction, from the simplest, such as sharing common spaces like lobbies, elevators, courtyards, or parking lots, to the more complex, such as participation in condominium meetings and collective decision-making. When attitudes of respect and collaboration prevail, residents tend to cooperate in the maintenance of common spaces, support collective initiatives (such as shared maintenance or energy efficiency projects), and constructively resolve any issues. This approach fosters a climate of mutual trust, fostering a sense of belonging and improving the quality of life. From this perspective, condominiums can be interpreted as a unified model that considers all stakeholders involved in condominium life.

One of the fundamental tools for ensuring this balance is the condominium regulations, which constitute the cornerstone of coexistence. They do not merely regulate the administrative aspects of management, but clearly define the rights and duties of each resident (whether owner or tenant), establishing the rules that allow for living in an organized and respectful community (CERISS & Comune di Reggio Emilia, 2008). Through precise rules, the regulations aim to prevent conflicts and arguments, providing shared criteria for addressing the daily issues of shared life. All condominium members are required to know and respect them, even if they disagree with some of their contents. Italian law recognizes their importance, making them mandatory when there are more than ten condominium members (Civil Code, art. 1138), and the provisions contained therein have full legal force.

As reported in the “Vademecum della buona convivenza in condominio” (CERISS & Comune di Reggio Emilia, 2008), the regulation can take two main forms:

- Contract or agreement (*contrattuale o pattizio*), usually drafted by the builder or the first owner of the entire building and accepted by each condominium owner at the time of purchase. It contains clauses that may be mandatory and can only be modified with the unanimous consent of all parties.
- Assembly regulation (*assembleare*), prepared by the administrator or one of the condominium owners and approved by the assembly with a majority representing at least half the value of the building (*500 millesimi*). This type of regulation is more flexible and can be amended with the same majority required for its approval.

Ultimately, condominium regulations are not simply formalities, but the foundation of coexistence: a tool that allows people with different habits and needs to cohabit in the same space with mutual respect and common interest.

Despite these tools, condominiums are also a context where conflicts related to divergent interests can arise. According to the most recent data, approximately 400,000 condominium disputes end up in court in Italy each year, equal to approximately 10% of all civil cases (ANAMMI, 2023). Analyzing various sources (ANACI Bologna, 2009; ANAMMI, 2023; INMEDIAR, 2019), the most frequent causes of disputes concern:

- Disturbing noises coming from other apartments (televisions at excessive volume, high heels, chairs being moved).
- Unpleasant odors, generally related to cooking activities.
- Improper use of common areas (incorrectly parked cars, materials stored in entrance halls, condominium terraces used as storage rooms).
- Pets (dogs that soil or bark, cats that meow at night).
- Management of services by the administrator (lack of transparency, insufficient cleaning of common areas, inadequate maintenance, central heating hours).

These conflicts reflect not only practical differences, but also differences in values, culture, or generation, which can make mediation more difficult. Often, the root of the dispute lies in small issues that could be resolved with common sense, listening, and mutual respect, with obvious benefits for the quality of life of all residents.

Furthermore, in condominium contexts, not all owners or tenants are able to regularly meet common costs: condominium arrears, increasingly widespread especially in periods of economic crisis, negatively impact the financial management of the building and can compromise the provision of essential services (ANACI & Consiglio Nazionale del Notariato, 2023b).

Indeed, delinquency is not just a financial issue; it also has significant social and organizational implications. As highlighted by Hector Simon-Moreno (Simón-Moreno, 2024), it is a phenomenon often linked to economic fragility and family vulnerability, which are intertwined with rising housing costs and growing urban inequalities. Beyond the direct economic damage to the condominium, the presence of delinquent condominium members can generate tensions among residents, undermine mutual trust, and increase legal disputes, with additional costs borne by the condominium community. Furthermore, the administrator must balance two conflicting objectives: on the one hand, ensuring coverage of common expenses and the continuity of services; on the other, seeking transitional solutions and repayment plans that do not further aggravate the conditions of the most vulnerable members.

Therefore, the ability of the administrator and the assembly to play a mediation role becomes essential to prevent and manage such situations (INMEDIAR, 2019).

4.2.2.2 Social cohesion and sense of community

Alongside potential conflicts, condominium life also offers opportunities for social cohesion. As Denise Bruno highlights in her research on housing welfare (Bruno, 2022), physical proximity and the sharing of common rules can foster a sense of community, a sense of belonging based on relationships of mutual understanding, trust, and support. In many cases, especially in small buildings or historically consolidated residential contexts, informal support networks develop between neighbors (for example, in caring for the elderly, watching over children, or managing minor emergencies), which enhance the condominium's social capital.

A concrete practical example, consistent with the vision of condominiums as welfare, is the initiative of a suburban building that has established a "shared shopping" service: a group of condominium members collectively purchase everyday items (such as groceries or cleaning supplies), benefiting from

wholesale discounts and distributing the goods according to a schedule. This type of project not only lowers costs, but also strengthens interpersonal relationships and a sense of solidarity. Another example could be a shared babysitting service, organized among the families in the building, in which parents alternate childcare according to a shared schedule.

Another concrete example is represented by the “social concierges” that have emerged in some Italian cities such as Milan and Turin, where condominiums and neighborhoods organize themselves to offer shared services, such as elderly care or childcare, creating common spaces and promoting collective activities (Comune di Milano, 2025). In several historic neighborhoods of Bologna, for example, residents have developed self-help groups that deal with minor domestic emergencies or mutual monitoring in the event of prolonged absences, thus strengthening trust and bonds between residents (Geromel, 2022). A further case of cohesion is that of the urban co-housing experiences documented in social regeneration projects, such as in Turin in the Sharing Torino project, where residential proximity favors the creation of supportive communities that sustain themselves through shared activities (Sharing Torino, 2025). In these contexts, residents not only respect common rules, but actively collaborate in the management of spaces, organizing parties, markets, and workshops that strengthen relational capital.

Starting from this framework, Fabbri and Bracci's sociological research (Fabbri & Bracci, 2021) analyzed everyday intercultural practices in multiethnic apartment buildings in cities like Milan and Rome, where cultural difference sometimes acts as a constraint, but more often as a resource for building inclusion processes. In these contexts, small everyday gestures (such as exchanging traditional dishes between neighbors of different cultures or organizing multicultural events in the condominium courtyard) become opportunities for mutual recognition and overcoming social barriers, fostering processes of social inclusion.

Bruno (2022) highlights how, in contexts where social and housing functions are intertwined, the condominium can become a local welfare structure: thanks to mutualism practices, internal microservices and inclusion paths, the building can also respond to the social needs of its inhabitants, transforming the simple “multiple dwelling” into a supportive community.

4.2.2.3 Solitary coexistence and collective security

However, physical proximity alone does not guarantee the establishment of deep social relationships. Contemporary condominium life often reflects social isolation, where individuals live in close contact with others without developing meaningful relationships, limiting themselves to functional or superficial connections (Bruno, 2022). This phenomenon is encouraged by factors such as residential mobility, individualism, misaligned work schedules, and the prevalent use of digital communication channels to interact with other residents or to report problems to the administrator (without direct interaction).

In public housing contexts, this lack of interaction contributes to weakening residents' collective capacity to manage common issues, such as the maintenance and safety of shared spaces, thus undermining not only the quality of coexistence but also their sense of responsibility for their living environment (Bruno, 2022). In such situations, the lack of a cohesive community can increase the perception of insecurity, fueling phenomena such as vandalism, degradation of common spaces, and poor social control, which would otherwise be mitigated by strong and collaborative neighborhood networks.

Similar situations are also found in new buildings, where, despite the quality of the apartments and services, residents report limited opportunities for socialization and a widespread tendency to communicate only through digital channels or with the building manager, avoiding direct interaction.

Indeed, communication often relies on the growing use of technologies, which, while facilitating and speeding up management, also reduce opportunities for physical encounters, reinforcing a model of "solitary coexistence."

This isolation, in addition to limiting social bonds, weakens the sense of community and the desire to care for common spaces, complicating the shared management of fundamental issues such as maintenance, security, and environmental education. Security, in particular, cannot be entrusted solely to technological systems (cameras, digital intercoms, sensors), but requires the active contribution of residents: the natural surveillance provided by the presence and collaboration of neighbors remains an irreplaceable element in preventing conflicts and risky situations.

The challenge, as Bruno (2022) highlights, therefore consists in reactivating solid community relationships, integrating technological potential with housing and social practices that foster participation, a sense of belonging and shared responsibility, so as to strengthen not only the quality of coexistence, but also collective security.

The social dimension of condominiums is therefore characterized by a delicate balance between cooperation and conflict, cohesion and isolation, homogeneity and demographic diversity. Understanding these dynamics is essential to developing management models that go beyond simply solving technical or administrative problems, but also enhance social capital, promote dialogue among residents, and support harmonious coexistence. From this perspective, condominium management is not simply a matter of operational efficiency, but a true tool for building community.

4.2.3 Economic Dimension of the Condominium Life

Beyond the social dimension, the economic dimension of condominium life is also a key factor in understanding the management dynamics and quality of living in multi-ownership residential buildings. While condominiums are often perceived as social microcosms, they also constitute a microeconomy in which residents (owners and tenants) contribute to covering fixed and variable costs, planning shared investments, and managing collective resources. Therefore, condominium economic decisions do not simply impact ordinary expenses but also influence individuals' ability to support innovations and energy efficiency measures.

4.2.3.1 *Structure and incidence of condominium expenses*

Condominium expenses are one of the most significant aspects of condominium life, as they directly impact residents' budgets and reflect the needs related to the management, maintenance, and enhancement of the building. These expenses are divided into two broad categories: ordinary expenses and extraordinary expenses. According to the distinction reported by Unione Professionisti (2024), ordinary expenses include recurring activities necessary for the daily functioning of the condominium, such as cleaning stairwells, lighting common areas, routine elevator maintenance, and managing shared heating. Extraordinary expenses, on the other hand, concern infrequent and larger-scale interventions, such as roof replacements, facade renovations, or the replacement of structural systems (Unione Professionisti, 2024). The latter generally require prior approval from the condominium assembly, with a qualified majority representing at least 50% of the building's value (Article 1136, paragraph 2, Civil Code).

A further distinction concerns divisible and indivisible expenses. The former are divided based on the use or enjoyment of common areas, as in the case of heating, while the latter are divided equally among

all condominium owners, regardless of actual use, such as roof maintenance (Unione Professionisti, 2024).

The distribution of expenses is regulated by the Civil Code (Article 1123) and the condominium regulations. Typically, this is based on the ownership interest, which assigns each condominium owner a share proportional to the surface area and value of their property compared to the overall building. However, the regulations or the assembly may establish different criteria, adapting them to the specific needs of the building (Unione Professionisti, 2024). The expenses necessary for the maintenance and enjoyment of common areas, the provision of services, and any innovations approved by the majority are therefore borne by the condominium owners in proportion to the value of their property, unless otherwise agreed. If some common areas serve the condominium owners to a different extent (as is the case with the central heating system), the distribution is based on the potential use of each participant (ANACI & Consiglio Nazionale del Notariato, 2023a).

As mentioned previously, condominium fees are broken down into a variety of items, ranging from essential services to maintenance, administrative, and personnel costs, including insurance and green space maintenance. Their impact varies depending on the building's characteristics, the number of units, the presence of centralized systems, and the additional services offered.

To better understand the weight of the different expense items, it is useful to analyze a concrete example of the distribution of operating or usage costs relating to a medium-large sized condominium (D'Auria, 2025) (Figure 50).

I costi di esercizio o d'uso

Un esempio

CONDOMINIO ABITAZIONI ED UFFICI SUPERFICIE LORDA 5.100 MQ		
VOCI DI COSTO	COSTI (€)	%
Portierato	21.794	18,28
Illuminazione	2.737	2,30
Acqua potabile	3.667	3,08
Tasse ed imposte	362	0,30
Manutenzione ordinaria	15.029	12,61
Amministrazione	2.841	2,38
Assicurazioni	4.390	3,68
Riscaldamento	57.482	48,22
Giardino	3.305	2,77
Ascensori	7.592	6,37
TOTALE	119.198	100,00
Tabella dei costi parametrici		
Costo al mq	23,40	mq 5.100,00

Due corpi di fabbrica di otto piani fuori terra, seminterrato adibito a box auto.
Vi sono 47 appartamenti e 48 box, 2 scale e 4 ascensori.

Figure 51: Operating or usage costs for a medium-large sized condominium. Source: D'Auria, n.d.

For a building with a gross floor area of 5,100 m², the total annual budget amounts to approximately €119,198, or €23.40/m².

By far the most significant item is heating, which alone accounts for nearly half of the total cost (48.22%, or €57,482). This data confirms that energy consumption, especially in large buildings or those with centralized systems, is the main cost factor for condominiums.

Following significantly behind are concierge costs (18.28%, €21,794), which reflect the costs of security and reception staff, and ordinary maintenance (12.61%, €15,029), essential to ensuring the functionality and decor of common areas. Elevator costs (6.37%, €7,592), insurance (3.68%, €4,390), and administration (2.38%, €2,841) account for a smaller but still significant share of the total, demonstrating the wide range of costs involved in the building's day-to-day management.

Other items, such as lighting (2.30%, €2,737), garden (2.77%, €3,305), and drinking water (3.08%, €3,667), while representing smaller percentages, contribute to ensuring comfort and quality of life in the condominium. Finally, taxes and fees (0.30%, €362) are a residual impact, almost negligible compared to the total.

This distribution highlights how living in a condominium entails a series of structural expenses for each household, which, when added to ordinary household expenses, can significantly impact the annual budget. The presence of non-compressible fixed costs - such as heating, routine maintenance, and concierge services - limits individual residents' savings, especially in large buildings or those with centralized heating systems. In particular, the share allocated to heating confirms the need for targeted energy efficiency policies, such as insulation, replacement of obsolete systems, and the use of renewable energy sources, which can translate into significant cost reductions and lasting environmental benefits. However, while these interventions aim to reduce consumption and increase the property's asset value, they require initial investments that cannot always be easily afforded by all residents.

At the same time, families must consider that condominium management also requires resources for services that improve quality of life - such as concierge services, gardening, or maintenance of common areas - but which entails recurring and unavoidable costs. For low- to medium-income households, these expenses can represent a significant portion of the household budget, sometimes creating difficulties in meeting both condominium and personal expenses (mortgage, rent, utilities). Proper allocation of expenses, management transparency, and shared planning of extraordinary maintenance therefore become essential tools to ensure economic sustainability and prevent tensions between condominium owners.

4.2.3.2 Economic disparities and energy sustainability

The analysis of the structure and incidence of condominium expenses highlights not only the complexity of their distribution based on the thousandths of ownership (art. 1123 of the Civil Code), but also the concrete difficulties linked to the different economic availability of residents (Unione Professionisti, 2024).

These economic disparities emerge even more clearly when the assembly is called upon to approve major, extraordinary interventions, such as the renovation of centralized systems, the replacement of fixtures, the installation of electric vehicle charging stations, or the thermal insulation of the building. In such cases, the divide between those with the necessary resources and those unable to afford the investment becomes a decisive factor not only for the technical and economic feasibility of the works, but also for social cohesion within the condominium community (Sampieri, 2011).

The challenges are exacerbated in condominiums characterized by high social heterogeneity, where medium- to high-income households coexist with rent-controlled tenants and families from public housing programs. In such contexts, the need to balance energy sustainability objectives and real spending power can slow or even halt redevelopment projects that, if implemented, would guarantee a dual benefit: reduced operating costs and enhanced property value (Sampieri, 2011).

To avoid decision-making deadlocks and tensions among residents, mediation tools, such as the introduction of deferred payment plans and the use of public incentives that reduce the direct economic impact on families, became essential. In this context, an active role for the administrator is essential to foster dialogue, ensure management transparency, and identify shared solutions (ANACI & Consiglio Nazionale del Notariato, 2023a).

Furthermore, in recent years, the growing focus on energy efficiency and environmental sustainability has led to the introduction of new expenditures for technological upgrades and retrofitting (Bruno, 2022). Public policies have proven crucial in making these interventions economically accessible. As explained in section “2.2.1.3 *Building Age and Energy Performance*”, in Italy, measures such as *Superbonus 110%*, *Ecobonus*, *Bonus Casa* and *Bonus Facciate* have significantly incentivized the initiation of energy and structural retrofitting.

These interventions, in addition to improving the energy performance of buildings, generate long-term economic benefits for residents. According to the guide “Tips for communicating and disseminating the benefits of energy efficiency interventions and reducing consumption” (ENEA & REACT Group, 2025), it is essential to identify potential savings both in overall terms (percentage reduction in consumption) and at the level of individual housing units, which can vary based on size and exposure.

As illustrated in *Figure 51*, energy efficiency interventions vary in terms of investment levels and long-term economic returns. Some low-cost measures, such as regular boiler maintenance or domestic hot water temperature control, result in small but immediate savings (around 5%, equivalent to €48–120 per year), making them particularly accessible even to families with limited resources. An intermediate step is represented by devices such as chronothermostats or thermostatic valves on radiators, which with a medium-low investment improve heat management, achieving savings of up to 20% (€80–320 per year). More significant interventions, such as replacing the heating system with a more efficient one, can generate savings of between 20% and 40% (€300–600 per year), but require medium-high installation costs. Finally, the most impactful structural interventions (such as improving thermal insulation or replacing window frames) require significant investments but guarantee considerable long-term benefits, with savings of up to 40% (equal to approximately €640 per year).

	Risparmio annuo (%)	Costo	Risparmio annuo (euro)
Fare la manutenzione della caldaia periodicamente	5%	Basso	120
Controllare la temperatura dell'acqua calda sanitaria	5%	Basso	48
Installare un cronotermostato	5%	Basso-medio	80
Installare delle valvole termostatiche sui radiatori	20%	Medio	320
Installare un nuovo impianto di riscaldamento più efficiente	20-40%	Medio-alto	300-600
Migliorare l'isolamento termico	40%	Alto	640
Sostituire gli infissi	15-20%	Alto	240-320

*I dati contenuti nelle tabelle sono calcolati ipotizzando una spesa per il riscaldamento di circa 1.600 euro annui

Figure 52: Possible interventions and their impact. Source: ENEA & REACT Group, n.d.

This analysis highlights how the priority of interventions depends on the residents' initial financial resources and investment capacity. While low-cost solutions offer immediate results, structural solutions achieve the greatest and most long-lasting savings, positively impacting not only household spending but also the property's asset value and the condominium's overall environmental sustainability.

Therefore, thanks to substantial tax deductions, many condominiums have been able to undertake projects that, without incentives, would have been difficult to sustain, with positive effects also on the construction sector. However, actual access to these incentives has been uneven. Regulatory constraints, tight deadlines, bureaucratic complexity, and the need to advance payments; even if they are subsequently deductible, they have posed significant obstacles, especially for condominiums with less organizational capacity or less informed residents. These difficulties have effectively favored buildings with wealthier owners, experienced managers, or better-organized condominium structures, thus accentuating pre-existing disparities.

From a socioeconomic perspective, this trend raises several questions. On the one hand, the bonuses have acted as catalysts for innovation and redevelopment, accelerating the adoption of low-impact solutions and improving the efficiency of the building stock. On the other, they have highlighted the need for more inclusive policies, capable of ensuring access even for low- and middle-income families and small condominiums. Tools such as revolving funds, subsidized loans, public guarantees, or forms of co-financing could represent a necessary evolution to prevent energy and digital transitions from becoming a privilege reserved for a select few.

Looking ahead, the issue is not just about economic sustainability, but also about social cohesion and the right to housing. The ability to implement interventions to improve energy performance and safety without leaving the most vulnerable behind will be crucial to ensuring more efficient buildings, more balanced communities, and real progress towards sustainable and inclusive cities.

Ultimately, condominium living requires finding a dynamic balance between service quality, cost control, and investment capacity - a balance that can be fostered by transparent and efficient management, public policy support, and increased resident awareness of maintenance and energy choices that impact collective well-being.

4.2.4 Managerial and Relational Dimension of Condominium Life

Condominium life is based on a set of management needs shared by tenants and owners, which form the basis for the proper functioning of the building's governance. Among these, the most relevant are the availability of integrated and efficient condominium services, timely emergency response, and the ability to receive clear and rapid responses to requests. The ability to meet these needs is a key factor in the quality of life and resident satisfaction (Rolfe et al., 2020).

Residents expect management that ensures livability of common areas, efficient services, and balanced neighborly relations, elements that contribute to creating a comfortable and safe living environment (Rolfe et al., 2020). For owners, these aspects also take on economic significance: attentive management of scheduled maintenance, cleanliness, and accessibility helps preserve and increase the value of the property (Muczyński, 2023). The quality of condominium management therefore not only protects the physical integrity of the building, but also becomes a genuine economic factor, capable of impacting the return on investment and the building's reputation in the real market.

Communication is a key concern among residents. Residents want to interact with the property manager or management company in a transparent, accessible, and two-way manner, allowing them to report issues, monitor resolution, and receive timely updates. According to MRI Software (MRI Software, 2024), clear communication and rapid response are two of the primary expectations in residential property management today: tenants expect to be able to easily contact the manager, receive personalized responses, and experience attention to their needs, including through the use of digital tools. A lack of ongoing communication or slow responses generate frustration and distrust, undermining the perception of the property manager's reliability.

A second critical area concerns maintenance and technical management of interventions. Tenants expect requests to be addressed efficiently, with clear response times and a distinction between emergencies and routine interventions. Proactive management, based on periodic checks and preventative maintenance, not only reduces future costs but also strengthens residents' trust and preserves the property's value. Adopting predictive maintenance approaches, such as through sensors or monitoring software, can anticipate breakdowns and improve service continuity, demonstrating how digitalization has become an integral part of modern management.

The perceived quality of services provided by condominium service providers is also a key factor in the overall evaluation of the living experience. Residents tend to judge the effectiveness of management not only based on the administrator's decisions, but also on the reliability, punctuality, and professionalism of the companies responsible for maintenance, cleaning, security, and other common services. Timely work, with high quality standards, and clear communication regarding schedules and operating procedures contribute to strengthening trust in the entire management system. Conversely, delays, poor service delivery, or a lack of transparency in the execution of work generate dissatisfaction and negatively impact the perception of the overall quality of condominium governance.

At the same time, security is an essential element of residential satisfaction. MRI Software (2024) highlights how the perception of security profoundly impacts the living experience: residents feel valued and are more likely to stay when they perceive that their well-being and safety are management priorities. According to Rolfe et al. (2020), a safe and well-maintained environment contributes not only to daily comfort, but also to the physical and psychological well-being of residents. Concrete measures include the adoption of controlled access systems (badges, PINs, apps), video surveillance in common

areas, adequate lighting, and emergency maintenance available 24/7. Security, therefore, is not just a technical issue, but also a relational lever, as it strengthens trust in the administrator and the sense of community among residents.

Another crucial aspect is transparency in financial and administrative management. Clear and simplified access to budgets, documents, and assembly decisions is perceived as essential for building trust and ensuring fairness in relationships between condominium owners (MRI Software, 2024). Digital platforms that allow real-time access to expenses, scheduled interventions, and payment statuses effectively address this need, reducing uncertainty and increasing the perception of control and participation. Residents also demonstrate a growing need for immediate and comprehensible access to information, aimed at reducing bureaucracy and simplifying daily management. This concerns not only financial aspects, but also the scheduling of interventions, the use of common spaces, and the traceability of reports. The introduction of "smart" monitoring and communication systems raises perceived quality standards, promoting more efficient and transparent management (MRI Software, 2024).

Finally, building a sense of community emerges as a key strategy for improving satisfaction and reducing turnover. Initiatives such as organizing joint activities, enhancing shared spaces, or fostering neighborly relationships help strengthen social bonds and create a collaborative climate. From this perspective, management is not limited to a set of administrative tasks, but is a social and participatory process, in which efficiency, communication, and cohesion contribute to collective well-being.

4.2.5 Opportunities and Challenges for Tenants and Owners

Understanding residents' needs and expectations is crucial to ensuring tenant and owner satisfaction and to building a condominium model capable of evolving with the demands of contemporary society. Integrating operational efficiency, transparency, security, and communication into condominium governance not only improves the quality of daily life, but also strengthens mutual trust between residents and the administrator, laying the foundation for cohesively addressing future challenges.

The analysis conducted in the chapter has shown that divergent rights and time horizons between owners and tenants, together with socio-demographic heterogeneity, generate misaligned priorities and recurrent tensions around the use of common spaces, expense allocation and everyday cohabitation. These dynamics can escalate into conflicts and arrears, particularly where communication is fragmented and residents perceive distance from decision-making processes and limited transparency on costs and services. From an economic point of view, fixed costs for maintenance, heating, and shared services place a significant burden on households, particularly those with lower incomes. This disparity can delay or prevent necessary interventions, despite their long-term benefits. At the same time, the progressive digitalization of condominium life creates a risk of new divides for less digitally skilled residents, especially for older people, and adds concerns regarding data protection and cybersecurity.

On the other hand, these challenges are mirrored by significant opportunities. When appropriately mediated, the complementary roles of owners and tenants allow the integration of long-term investment perspectives with attention to everyday service quality. Moreover, socio-demographic diversity can be leveraged as a resource for cultural exchange and mutual support, particularly where community-oriented practices and "welfare-in-condominium" initiatives, such as babysitting networks or co-housing arrangements, are intentionally promoted. Finally, the adoption of digital platforms, transparent access to documents and budgets, shared information channels and data-driven

monitoring of services create concrete opportunities for residents to participate more actively, reduce information asymmetries, build trust in management and contribute to a more accountable and inclusive condominium governance model.

Diagram 4 summarizes the key challenges and opportunities affecting residents and condominium owners within the condominium context, highlighting economic, social and relational dimensions.

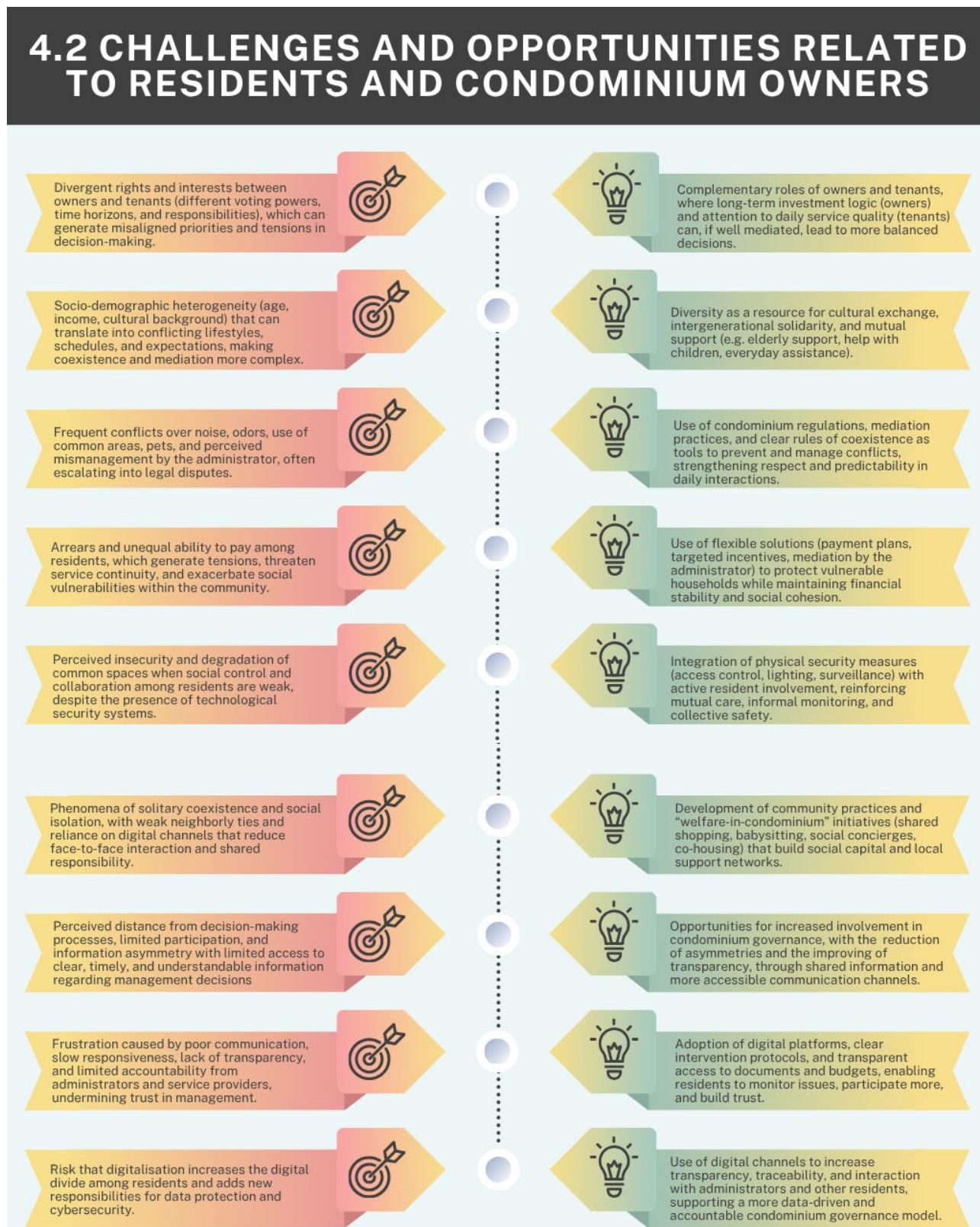


Diagram 4: Main challenges and opportunities of condominium residents. Source: Own Elaboration

4.3 The role of the Condominium Manager: Tasks, Limitations and New Pressures

The condominium manager plays a pivotal role in the governance of multi-owned residential buildings, operating at the intersection of administrative, legal, technical, and social dimensions of condominium life. Acting as the primary intermediary between property owners, residents, and service providers, the manager is responsible for ensuring the day-to-day functionality of shared assets while safeguarding the collective interests of the condominium community. Over time, this role has become increasingly complex due to regulatory changes, rising technical requirements, and evolving social expectations regarding transparency, sustainability, and responsiveness.

This section analyzes the professional profile of the condominium manager by examining both its institutional foundations and the new pressures currently reshaping the profession. It first outlines the legal and regulatory framework governing the role under Italian law, focusing on appointment procedures, formal requirements, and core responsibilities. It then explores the multidisciplinary competences increasingly required of condominium managers, highlighting their positioning between traditional administrative functions and broader property, building, and facility management practices. The chapter subsequently examines the organizational structure of the sector in Italy, comparing prevailing professional models and situating them within a broader European context. The discussion then moves on to the main implications of these professional models and concludes with an analysis of emerging trends and the possible professional evolution of the role. Finally, the chapter discusses the manager's relationships with key stakeholders, including residents and service providers, as a crucial element for effective coordination and trust-building within the condominium community. In this way, it was possible to analyze the critical challenges affecting the profession today, particularly in relation to stakeholder relationships, market fragmentation, and digital transformation, thereby setting the stage for the chapter on the digitalization of condominium management.

4.3.1 Institutional Role and Core Responsibilities

Within the Italian legal system, the condominium manager represents a central institutional figure in the functioning of residential communities. While the role is defined by a precise set of legal obligations, its practical implementation is increasingly shaped by operational constraints, managerial tools, and the growing technical, regulatory, and social complexity of contemporary buildings and their residents. This section examines the current regulatory framework, the legal requirements governing the profession, the manager's core duties and responsibilities, and, ultimately, the evolving role of the condominium manager as a governance actor within the residential community.

4.3.1.1 *Framework: legal and professional requirements*

The legal discipline governing condominium managers is primarily rooted in the Italian Civil Code, specifically Articles 1129–1138, which define the procedures for appointment, the scope of authority, and the duties associated with the role. A major turning point occurred with the enactment of Law No. 220 of December 11, 2012, which introduced significant reforms aimed at strengthening transparency, professional accountability, and the protection of condominium owners. Following this reform, the condominium manager can no longer be considered a purely discretionary or informal appointment but must instead comply with specific legal, professional, and ethical requirements.

One of the most relevant changes introduced by Article 1129 of the Civil Code concerns the obligation to appoint a condominium manager in buildings composed of more than eight units, replacing the previous threshold of four. This adjustment reflects the increasing complexity of condominium

management and encourages the delegation of responsibilities to more qualified professionals (*Temi Dell'Attività Parlamentare Legge 220/2012 - Riforma Del Condominio*, 2010).

The reform also introduced a set of formal disclosure obligations intended to enhance transparency and traceability. At the time of appointment or renewal, the manager must provide condominium owners with detailed information, including personal and professional data, contact details and registered office (in the case of companies or associated firms), the location where condominium records are stored, and the details of a dedicated condominium bank account (Article 1129, paragraph 7). The introduction of a separate condominium account represents a crucial safeguard, ensuring the separation between the manager's personal assets and condominium funds and reducing the risk of conflicts of interest or financial mismanagement.

Another key innovation concerns the revocation of the condominium manager, which may be decided by the condominium assembly at any time, even without just cause, or ordered by a judicial authority in cases of serious irregularities (Article 1129, paragraphs 11-12). The law explicitly lists behaviors that justify judicial revocation, such as failure to open the condominium bank account, failure to convene the annual assembly for the approval of the financial statement, non-delivery of accounting documentation, or non-compliance with assembly resolutions (*Temi Dell'Attività Parlamentare Legge 220/2012 - Riforma Del Condominio*, 2010).

From an administrative transparency perspective, the reform reinforced the obligation to maintain and update four fundamental registers (Article 1130):

1. the condominium registry, containing data on owners, tenants, and technical characteristics of the units;
2. the assembly minutes register;
3. the register of appointment and revocation of the manager;
4. the accounting register, which records all financial transactions chronologically and must be preserved for at least ten years.

These tools promote a more managerial and document-based approach to condominium governance, helping to reduce informational asymmetries and sources of conflict.

The reform further clarified the distinction between professional and non-professional managers. Article 71-bis of the implementing provisions of the Civil Code establishes minimum educational, moral, and professional requirements for appointment. Specifically, candidates must hold at least a secondary school diploma, unless they were already serving as condominium managers prior to the reform under continuous appointment ("Requisiti dell'amministratore di condominio," 2024). Mandatory initial training courses are required, covering legal, technical, and accounting topics, along with periodic refresher courses to ensure continuous professional development ("Gestione condominio," 2024; "Requisiti dell'amministratore di condominio," 2024).

In addition to educational requirements, moral and ethical standards are imposed, excluding individuals with convictions for crimes against property or public administration, or those subject to restrictive measures (Article 71-bis disp. att. c.c.). These provisions aim to ensure the reliability and integrity of professionals entrusted with managing collective financial resources and social relationships.

Despite these regulatory advancements, a major weakness of the current framework remains the absence of a mandatory national register or professional body for condominium managers. Several legislative proposals have suggested the creation of a certified register managed by public institutions, but none have been fully implemented. As a result, the sector remains territorially fragmented and open

to uneven professional standards, with potential negative impacts on service quality and trust (“Riforma del Condominio in Italia,” 2025).

Overall, Law 220/2012 represents a significant institutional and cultural shift, reinforcing transparency and accountability while laying the groundwork for a more professional and participatory model of condominium governance. Within this framework, the condominium manager increasingly emerges not only as an administrative executor but also as a key governance actor mediating between collective interests, regulatory obligations, and service quality.

4.3.1.2 Core duties and responsibilities

Article 1130 of the Civil Code defines the core duties of the condominium manager, combining executive, coordinative, and operational functions.

These include the implementation of assembly resolutions and compliance with condominium regulations, financial and accounting management through the use of a dedicated bank account, the preparation of annual financial statements and related documentation, and the maintenance of statutory registers (“Gestione condominio,” 2024).

The manager is also responsible for convening condominium assemblies at least once a year for financial approval and whenever extraordinary circumstances arise. Additional duties include overseeing ordinary maintenance of common areas, carrying out urgent interventions to prevent damage or safety risks, and managing shared systems and services (“Parti comuni del condominio,” 2025).

Relations with service providers constitute another critical responsibility, encompassing the selection, contracting, and supervision of suppliers for cleaning, maintenance, gardening, energy provision, and technical services. From a fiscal perspective, the condominium acts as a tax entity through the manager, who is responsible for withholding taxes, filing tax returns, and complying with fiscal obligations (“Gestione condominio,” 2024).

In recent years, condominium managers have also assumed a central role in coordinating energy efficiency and renovation projects, particularly in relation to incentive schemes and regulatory compliance (“Le competenze dell’Amministratore di condominio - INFOBUILD,” 2024).

In addition to these tasks, case law and operational practice have recognized further administrative, technical, and relational functions, which make the role of the administrator increasingly complex. In fact, the administrator acts not only as the manager of common resources, but also as the legal representative of the condominium vis-à-vis third parties, responsible for the safety of the facilities and as a liaison with technicians, public bodies, and banking institutions (Grassi, 2010). These tasks integrate the legislative model with the contemporary operational context, where administrators increasingly have the possibility to use digital tools (for instance management software, condominium portals, communication tracking systems) to perform their duties with greater efficiency and transparency.

The administrator is legally liable for his or her professional conduct, both civilly and criminally. Civil liability may arise from managerial negligence, failure to perform maintenance, or mismanagement of resources, while criminal liability arises in cases of intent or gross negligence, such as failure to comply with safety regulations resulting in damage to persons or property (Molinaro, 2024).

To protect condominiums, the law provides for the possibility, at the request of the assembly, to take out a professional civil liability insurance policy covering acts performed in the exercise of the mandate.

Furthermore, loss of integrity or failure to undergo professional training and refresher courses will result in automatic dismissal from the position. These measures, together with mandatory annual reporting, help to consolidate trust between the administrator and the condominium community.

4.3.1.3 The condominium manager as a governance actor

Regulatory reforms and the growing complexity of condominium living have transformed the professional profile of the condominium manager. As noted by Sabin (2019), the role now requires the integration of accounting, legal, technical, and communicative competences, positioning the manager as both a relational coordinator and an organizational facilitator.

Beyond executing assembly decisions, the manager increasingly operates within a governance framework, mediating conflicts, and promoting shared solutions. In this perspective, the administrator is no longer just an executor, but a coordinator of people, processes, and resources, who helps to strike a balance between individual and collective interests. As Molinaro points out (2024), their role “needs to be reinvented, interpreting the needs of civil society and promoting a new culture of the home.”

With this in mind, the administrator acts on three levels of responsibility:

- Services to building: ensuring that common areas function properly, that systems are safe, and that maintenance is scheduled and preventive.
- Services to people: mediating between individual and collective needs, ensuring transparent accounting, involving condominium owners in strategic decisions (e.g., regarding extraordinary work or energy efficiency).
- Services to the organization: structuring processes, communications, records, and digital tools that enable coordinated management accessible to all stakeholders.

Although this governance function is not explicitly codified in legislation, it emerges as an operational necessity in increasingly complex residential contexts. The condominium can be understood as a micro-social system, whose stability depends on transparent rules, effective coordination, and participatory practices. In this sense, the administrator provides the institutional framework within which the dynamics of the residents develop, ensuring compliance with shared rules, regulatory compliance, and a balance between individual expectations and collective interests.

Furthermore, it should be noted that the 2012 reform, in addition to tightening the regulatory framework, introduced a new vision of condominium management as a space for cooperation and shared responsibility.

In this sense, the administrator becomes a facilitator of change (“Requisiti dell’amministratore di condominio,” 2024), capable of promoting sustainable behavior, improving communication between residents, and encouraging the adoption of digital tools for participatory asset management. This perspective paves the way for a collaborative governance model, in which the management of common areas is not limited to a technical-administrative sphere, but is transformed into a social and relational process oriented towards collective well-being.

4.3.2 Competences Required and Professional Profile

The analysis of the condominium administrator’s role cannot be limited to regulatory aspects alone, but must also address the set of competences, skills, and professional configurations that define this figure in practice. In recent years, the progressive complexity of condominium management, combined with regulatory reforms and market transformations, has contributed to reshaping the professional

profile of the administrator, expanding its scope from a primarily administrative function to a multidisciplinary and increasingly managerial role.

This section therefore examines the competences required of contemporary condominium administrators, the hybridization of professional roles within the broader real estate management framework, and the organizational models that characterize the Italian context. Through a structured analysis of skills, professional profiles, and emerging trends, the following paragraphs aim to highlight the ongoing evolution of the profession and its implications for efficiency, governance, and service quality within residential buildings.

4.3.2.1 Multidisciplinary competences and required knowledge

As highlighted above, the 2012 reform represented a turning point in the professionalization of condominium administrators, introducing mandatory training requirements, periodic updates, and an expansion of civil and managerial responsibilities. An analysis of the legislation clearly shows the legislator's desire to outline a more transparent, responsible, and controllable profile for condominium management, geared towards protecting the collective interests of condominium owners and safeguarding the interests of third parties. With this in mind, the role of the administrator is strengthened not only in terms of skills but also in terms of accountability: the administrator becomes fundamental in ensuring efficient, ethical, and verifiable management of the condominium. (Molinaro, 2024)

However, regulatory compliance represents only the starting point of a broader transformation that has progressively shifted the role from a predominantly administrative function to a multidisciplinary and increasingly managerial profession. The management of contemporary condominiums can no longer be limited to merely keeping records, implementing assembly resolutions, or managing accounts. Today, the administrator is called upon to coordinate a complex network of actors, including technicians, service providers, legal and fiscal advisors, and residents. The condominium thus functions as a micro-organization embedded within a wider urban and socio-economic system, an intermediate node between economic, technological, and relational dynamics. In this sense, it can be considered a sort of micro-society with its own rules, decision-making processes, and relationships.

Furthermore, the growing regulatory and technical complexity that characterizes the real estate sector, in areas such as safety, energy efficiency, environmental sustainability, privacy, and taxation, requires administrators to have cross-disciplinary training that is continuously updated. The ability to integrate knowledge from different fields has become essential to ensuring the quality and legality of management. It is no longer just a matter of complying with regulations, but of interpreting and applying them strategically, anticipating the needs of condominiums and developments in the building sector.

In addition to technical expertise, condominium managers must develop social and cultural sensitivity, acting as mediators, facilitators and promoter of cohesion among residents within multicultural and diverse residential communities. As Molinaro (2024) points out, the modern administrator must be able to interpret the needs of civil society and promote a new “culture of living,” in which the home and condominium are not only physical spaces, but also places of relationships, security, and quality of daily life. The work of the administrator determines not only the efficiency of economic and technical management, but also the harmony of social relations and, in a broader sense, the livability of the residential environment.

In addition to solid technical and legal training, therefore, administrators must develop a systemic vision that allows them to evaluate critical issues with an analytical approach, estimate the costs and benefits of management decisions, and advise condominiums in an informed and transparent manner.

Furthermore, this evolution also implies the need for advanced digital tools capable of supporting the management of complex and multidimensional processes. Management software, shared accounting platforms, portals for communication with condominiums, and maintenance monitoring applications are becoming essential tools for ensuring transparency, efficiency, and traceability. As Danea (2024) points out, these tools not only improve the administrator's productivity, but also encourage condominium owners to participate and promote trust in collective management.

The ability to integrate diverse skills through technological tools and management approaches therefore represents the new frontier of the profession. The administrator is no longer just a guardian of rules or an accounting manager, but a true coordinator of resources, relationships, and services, able to interpret the social and technical complexity of the condominium as a dynamic and participatory system.

The professional role must therefore be rethought and reinterpreted: no longer a simple executor of resolutions, but a strategic manager capable of combining technical, managerial, fiscal, legal, and communication skills in an integrated operating model. From this perspective, the condominium becomes a laboratory of governance, where the administrator acts as a manager of the building focused on sustainability, quality of life, and managerial innovation.

The table below (*Table 4*) summarizes the main competence areas required of condominium managers today, divided by subject area.

DOMAIN	DESCRIPTION OF CORE COMPETENCES
<i>Legal and Administrative</i>	Knowledge of the Italian Civil Code (Articles 1129–1138), Law No. 220/2012, condominium regulations, and related legislation (safety, privacy, procurement, building regulations, etc.). Ability to draft contracts, minutes of meetings, and condominium by-laws.
<i>Fiscal and Accounting</i>	Management of the condominium budget and preparation of financial statements; knowledge of tax and fiscal regulations; management of payments and relations with the Italian Revenue Agency; ability to optimize condominium expenses and correctly apply tax deductions and incentives (e.g., Superbonus, Ecobonus).
<i>Technical and Operational</i>	Understanding of building construction principles, building systems, safety, and maintenance; supervision of ordinary and extraordinary works; ability to coordinate maintenance activities; technical evaluation of cost estimates; knowledge of regulations related to safety, fire prevention, energy efficiency, and architectural barriers.
<i>Managerial and Organizational</i>	Ability to plan activities, set priorities, and manage deadlines and resources; coordination among suppliers, contractors, and professionals; implementation of standardized operating procedures; decision-making and problem-solving skills; a systemic view of relationships between people, processes, and resources.
<i>Communication and Relational</i>	Mediation and negotiation skills; management of conflicts and disputes among condominium owners; knowledge of mediation procedures; ability to communicate clearly and transparently; effective conduct of condominium assemblies; promotion of participation and mutual trust.
<i>Digital and Technological</i>	Use of management software for accounting and maintenance, collaborative platforms, digital signatures, and electronic archiving; knowledge of digital communication tools; ability to integrate smart solutions for building management.

<i>Environmental and Sustainability-Oriented</i>	Knowledge of regulations and opportunities related to energy efficiency, sustainability, and waste management; ability to promote sustainable practices, reduce consumption, and raise residents' awareness of environmental issues.
<i>Social and Cultural</i>	Promotion of coexistence and social cohesion; understanding of community and cultural dynamics; inclusive management of multicultural or intergenerational contexts; sensitivity to the needs of vulnerable individuals or persons with disabilities.

Table 4: Main areas of responsibility of a condominium administrator. Source: Own elaboration

4.3.2.2 The Condominium Manager as an Hybrid Professional Figure

As shown in the Table 4, the role of the contemporary administrator lies at the intersection of legal, fiscal, technical, managerial, and interpersonal skills. The multiplicity of skills required is not only a reflection of increasing regulatory complexity, but also a response to a broader transformation of the property management model, in which condominiums are becoming increasingly similar to micro-business organizations.

As explained in the previous chapters, in an increasingly integrated environment, condominium management requires a vision that combines technical and operational aspects with strategic and relational ones. In this context, condominium administrators are becoming more like corporate figures such as facility managers, building managers, and property managers, with whom they share the goal of ensuring continuity, infrastructure safety, and the well-being of residents.

According to research by Gianasso (2016a), in the real estate services sector there is a constant integration and overlap of skills between professions, because the boundaries between strategic management activities (assets and property) and operational activities (buildings and facilities) are no longer strictly separable.

Property management, as defined in the report “I Servizi Immobiliari in Europa e negli Stati Uniti” Gianasso (2016a), is closely linked to asset management and it's a sort of operational arm of it. As a matter of fact, the property manager is responsible for overseeing the profitability of a property or portfolio: they manage contracts, leases, deadlines, and maintenance, aiming to optimize the economic value of the investment.

This function includes building management, which represents the operational level of property management. It encompasses all technical interventions aimed at preserving the value of the property and ensuring continuity of rental income, taking care of the functioning of the structure and systems regardless of their state of use or occupancy. Its objective is to organize and monitor scheduled maintenance, ensuring that the building complies with efficiency, safety, and quality standards over time. In this context, the principal is the property owner, as the activity is geared towards protecting the invested capital. According to Gianasso (2016a), this feature distinguishes building management from facility management, which is primarily aimed at serving the end user.

As a matter of fact, facility management is a form of integrated and multidisciplinary management of all activities related to the optimal functioning of a building with the aim of maintaining its overall performance over time, with the goal of satisfying the needs of the users of the spaces. According to the definition of the International Facility Management Association (IFMA) (*What Is Facility Management?*, 2025), “Facility Management is an organizational function which integrates people, place and process within the built environment with the purpose of improving the quality of life of people and the productivity of the core business.” In this sense, facility management coordinates spaces, facilities,

equipment, and human resources. The facility manager, in fact, does not just organize activities but also has direct responsibility for their outcome, supervising maintenance, procurement, refurbishment, and services to the building, the organization, and the people.

In the context of condominiums, the administrator shares some of these functions with the property and building manager (such as accounting, supplier supervision, and maintenance management), but differs in terms of their collective and fiduciary role: they do not act primarily to maximize profit, but rather to ensure a balance between the interests of residents, the protection of common assets, and the economic sustainability of management. He therefore plays a fiduciary role, closer to the logic of participatory governance than to that of profit. In addition, the administrator may take on typical facility management tasks: supervising service quality, coordinating suppliers according to performance standards, and using digital tools to monitor costs, consumption, and performance. This approach is facilitated by the evolution of the real estate market, which increasingly requires professionals capable of operating on multiple levels: strategic (property), operational (facility), and organizational (building). Although the administrator is not responsible for the asset as a property manager, nor does he or she have the contractual obligation to achieve results typical of a facility manager, today he or she can play a hybrid role: guarantor of condominium governance, facilitator of services, and coordinator of resources.

In summary, the evolution of the professional profile of the condominium administrator highlights a progressive hybridization of skills. He remains a legal and fiduciary reference point for the condominium community, but at the same time incorporates methods and tools specific to real estate management such as a strategic maintenance planning, the use of integrated software, the information flow management, and care for the living experience. This convergence of roles, as explained in the previous chapters, reflects a broader transformation of the sector, in which the boundary between technical, economic, and relational management is tending to dissolve in favor of a systemic approach in which the condominium becomes not only an asset to be administered, but an organism to be managed and enhanced over time.

4.3.3 Professional Landscape and Organizational Models

The professional landscape of condominium administrators in Italy is characterized by marked organizational heterogeneity and an ongoing evolution toward more structured and integrated forms of management. The sector, traditionally fragmented and consisting of a multitude of independent micro-operators, reflects a historical configuration in which the role of administrator has remained predominantly individual and fiduciary. This configuration is closely linked to the peculiarities of the Italian residential context, which, as analyzed in chapter “4.1 *The Condominium in the Italian context: features and evolution*”, is characterized by a high rate of widespread private ownership, with a clear prevalence of small owners over large institutional investors or real estate groups. This ownership structure has historically limited the demand for integrated and standardized management services, favoring instead customized administrative solutions, often entrusted to individual professionals operating on a local scale. Secondly, the Italian building stock is largely outdated and consists of small to medium-sized buildings, often located in established urban areas. Although there has been an increase in new residential complexes in recent years, these remain limited in number and concentrated mainly in urban or suburban contexts, without having a structural impact on the overall demand for advanced property management services. Added to these elements is a regulatory and cultural tradition that has long viewed administrators as essentially administrative liaison figures rather than managerial operators within complex organizations. The combination of these factors have historically limited the demand for integrated and standardized property management services, favoring instead local and customized administrative solutions.

In recent years, however, the increasing complexity of building management, changes in the regulatory framework, and growing demand for transparency, efficiency, and integrated services are gradually changing the balance of the sector, paving the way for more structured and professionalized organizational models.

In this context, it is therefore essential to analyze the structure and organization of the sector in Italy in order to highlight the quantitative and qualitative characteristics that define its physiognomy, and then compare them with the prevailing models in other European contexts. This analysis aims to understand how different organizational configurations (from individual professionals to structured management companies) influence the quality, efficiency, and innovative capacity of condominium administration services. The analysis concludes with an examination of emerging trends and transformation processes that, in the future, could lead to greater integration of services, outlining new governance models for the residential sector.

4.3.3.1 Quantitative Overview of the Italian Sector Composition

As previously mentioned, the professional landscape of condominium administrators in Italy presents itself as a broad but profoundly heterogeneous system, characterized by a high degree of fragmentation and a progressive process of professionalization that is not yet fully accomplished.

According to the Tax Registry data reported in the 2nd report published by CENSIS–ANACI (ANACI & Censis Servizi, 2006), the number of administrators signing the 770 form (indicative of condominiums with medium-high complexity) increased from 35,684 in 2002 to 40,925 in 2003, with an average of approximately eight condominiums managed per administrator. This growth of over 5,000 professionals suggests a gradual transition from an activity performed on an occasional or voluntary basis to a more stable and recognized profession (*Figure 52 & Figure 53*).

Numero di condomini gestiti	N. di amministratori	%	N. d'immobili gestiti	%	Numero medio di condomini per amministratore
da 1 a 3	25.641	63%	33.485	10%	1,3
da 4 a 6	3.639	9%	17.702	5%	4,9
da 7 a 10	2.992	7%	25.086	8%	8,4
da 11 a 20	3.805	9%	56.635	17%	14,9
da 21 a 50	3.815	9%	119.845	36%	31,4
Oltre 50	1.033	3%	75.735	23%	73,3
<i>Tot più di 6</i>	<i>11.645</i>	<i>7%</i>	<i>277.301</i>	<i>21%</i>	<i>32</i>
TOTALE 2003	40.925	100%	328.488	100%	8

Figure 53: Condominiums and administrators by number of buildings managed. Source: ANACI & Censis Servizi, 2006

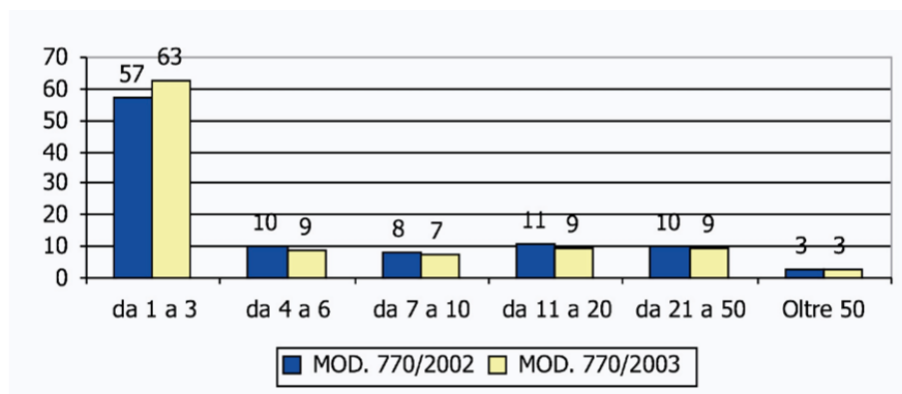


Figure 54: Administrators distribution by number of buildings managed (%). Source: ANACI & Censis Servizi, 2006

Based on these estimates, it is estimated that in 2003, approximately 41,000 administrators managed a total of 328,000 condominiums, while a significant number (up to 5,000 professionals) were responsible for a single building. The large gap compared to the total number of condominiums surveyed (between 740,000 and 930,000) highlights a "grey" area populated by informal administrators, often condominium owners themselves working on a voluntary basis or in local micro-structures (ANACI & Censis Servizi, 2006).

According to the 4th report by published CENSIS-ANACI (ANACI & Censis Servizi, 2010) based on a questionnaire administered in 2009 to 1,150 ANACI members, each condominium administrator manages an average of 39.5 condominiums. The distribution by age group shows that 40% of administrators have a client portfolio of 20 condominiums or fewer, while 8% manage more than 100 condominiums (Figure 54).

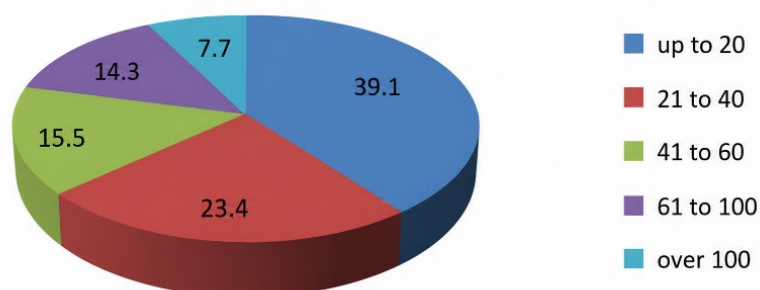


Figure 55: Numbers of condominiums managed. Source: ANACI & Censis Servizi, 2010

It should be noted that the survey participants are presumably professional administrators dedicated exclusively to this activity. Furthermore, the sample specifically excludes administrators with a number of condominiums managed equal to or fewer than 6, thus focusing on those who manage more than 6 condominiums.

Subsequent data from the Ministry of Economy and Finance, reported in the thesis written by Grassi (Grassi, 2010), confirm the persistence of this polarization: of approximately 320,000 active administrators, 265,000 manage a single building (in many cases the one in which they reside), 34,000 manage two to six condominiums as a secondary occupation, while only 21,000 dedicate themselves professionally to condominium management full-time.

According to more recent estimates, reported by the specialized press and industry associations, there are approximately 325,000 administrators active nationwide, of which fewer than 25,000 are fully-fledged professionals, managing an average of a significant but extremely fragmented condominium portfolio (Banca del Piemonte, 2023). Other reports indicate approximately 60,000 administrators, of which 25,000 are truly professionals, who manage approximately 60% of the Italian condominium portfolio (*I Condomini in Italia Tra Numeri e Norme | Blog*, 2014). Similarly, the article in La Stampa (Zanotti, 2022) reports a consistent figure: approximately 250,000 administrators, of which only 50,000 operate as fully-fledged professionals, who share a few dozen condominiums, while more structured firms can number as many as a few hundred, often in the most complex urban centers.

Overall, the emerging picture is of a highly fragmented sector, where the majority of administrators practice individually or semi-professionally, and a more structured minority manages a large portion of the national condominium assets. This structure has significant organizational and management consequences: uneven workloads, limited investment in digital tools, poor process standardization, and difficulty in achieving unified representation of the profession.

From a territorial perspective, the concentration of the profession is highest in the large metropolitan areas of Northern Italy, where population density and the complexity of the real estate assets require more advanced technical and organizational skills (Grassi, 2010). According to the 2nd CENSIS- ANACI report (ANACI & Censis Servizi, 2006), in the northern regions, the ratio of managed condominiums to the number of administrators is on average higher, indicating a more structured and organized professional structure. In contrast, in Central and Southern Italy, a "do-it-yourself" model still prevails, with a higher incidence of non-professional administrators or small family firms (*Figure 55 & Figure 56*).

Regione	N. di amministratori		N. di condomini		N. di condomini per amministratore
	n.	%	N.	%	
Abruzzo	861	2,1	6.050	1,8	7,0
Basilicata	215	0,5	1.066	0,3	5,0
Calabria	780	1,9	3.086	0,9	4,0
Campania	4.482	11	13.486	4,1	3,0
Emilia Romagna	2.285	5,6	33.050	10,1	14,5
Friuli Venezia Giulia	663	1,6	8.852	2,7	13,4
Lazio	6.105	14,9	33.463	10,2	5,5
Liguria	2.413	5,9	25.650	7,8	10,6
Lombardia	6.366	15,6	68.944	21	10,8
Marche	641	1,6	7.342	2,2	11,5
Molise	147	0,4	723	0,2	4,9
Piemonte	3.529	8,6	36.321	11,1	10,3
Puglia	2.830	6,9	17.153	5,2	6,1
Sardegna	847	2,1	4.840	1,5	5,7
Sicilia	3.377	8,3	13.704	4,2	4,1
Toscana	2.087	5,1	24.129	7,3	11,6
Trentino A.A.	706	1,7	5.310	1,6	7,5
Umbria	478	1,2	3.105	0,9	6,5
Valle d'Aosta	149	0,4	1.371	0,4	9,2
Veneto	1.964	4,8	20.843	6,3	10,6
TOTALE	40.925	100	328.488	100	8,0

Figure 56: Results of 770 Models at a regional scale. Source: ANACI & Censis Servizi, 2006.

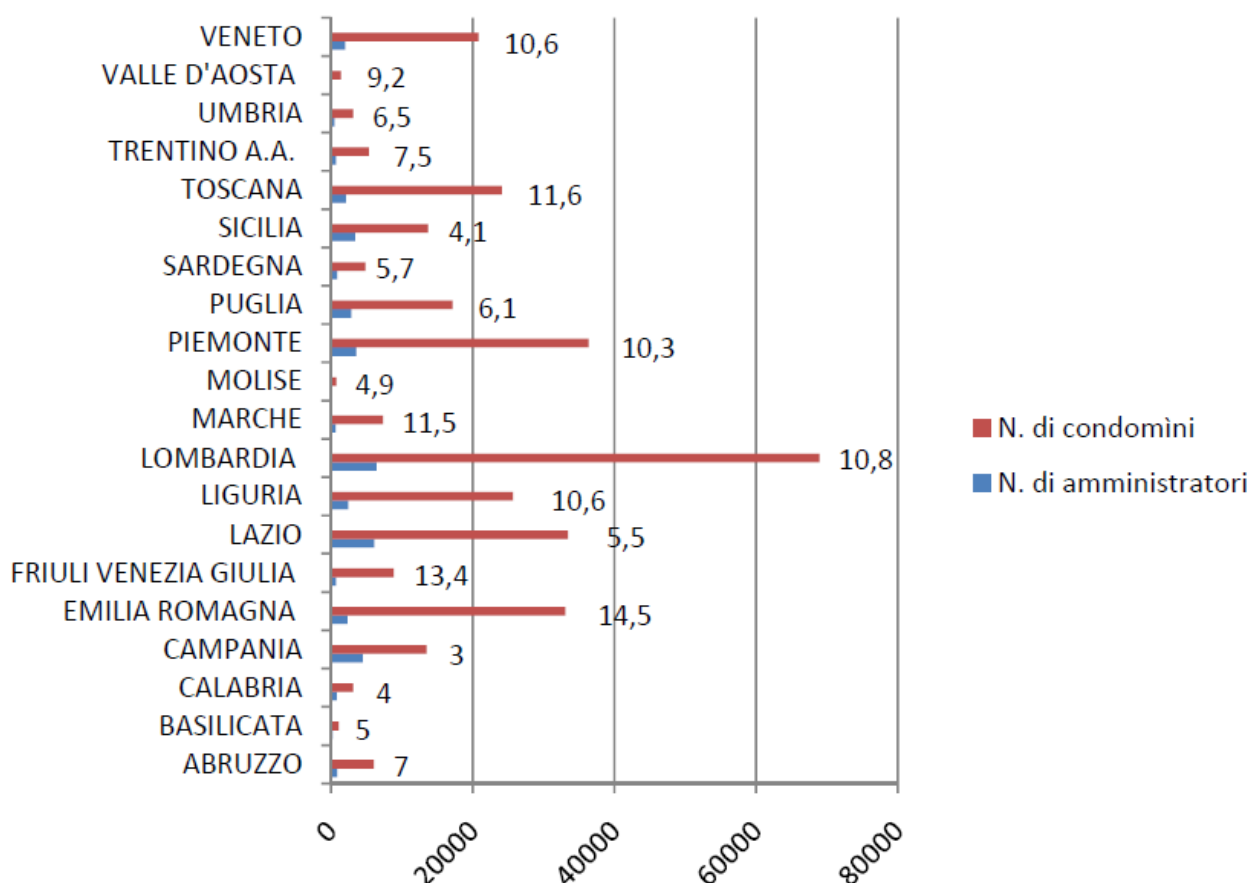


Figure 57: Graphical representation of the Results of 770 Models at a regional scale. Source: ANACI & Censis Servizi, 2006.

This territorial heterogeneity also reflects the different speed with which different areas of the country have implemented the management and regulatory innovations introduced in recent years, confirming a profession that evolves asymmetrically and is strongly influenced by the local socioeconomic context (Figure 57).

	N. di amministratori		N. di condomini		N. di condomini per amministratore	Rapporto % N° di amministratori e % N° condomini
	N.	%	N.	%		
NORD	15.662	38	174.691	53	76	7/10
CENTRO	12.732	31	100.462	30	58	1
ISOLE SUD	12.531	31	53.335	16	28	19/10
TOTALE	40.925	100	328.488	100	8	1

Figure 58: Results of 770 Models by geographical area. Source: ANACI & Censis Servizi, 2006.

A further factor in the fragmentation of the sector is the lack of a single professional register for condominium administrators. To date, in Italy, there is no professional association or official register regulating access to the profession, which is considered "unregulated" under current legislation (Ministerial Decree 140/2014). Practicing the profession is subject only to meeting initial training requirements and annual refresher courses.

In this context of freedom and lack of binding standards, numerous trade associations have emerged, which play an essential role in ensuring training, representation, and technical support for professionals in the sector. However, membership coverage remains very limited: ANACI (National Association of Condominium and Real Estate Administrators), the largest organization in the sector, has approximately 7,000 – 8,000 members, a modest number compared to the hundreds of thousands of professionals in the sector.

The main active associations include, in addition to ANACI, entities such as ANAMMI, UNAI, BMItalia, ALAC, ASS.I.A.C., APAC, ABICONF, and many others, often born from private initiatives or local associations (Redazione ESTIA SpA, 2022). These organizations offer services such as:

- training and refresher courses;
- legal, tax, technical, and accounting consultancy;
- access to or purchase of software;
- publication of specific journals;
- conferences or professional networking opportunities.

This plurality, while stimulating competition and training offerings, also contributes to the disintegration of the profession's unified representation, slowing the progress of comprehensive reforms and the definition of shared quality standards. In the absence of a register or centralized regulation, the profession continues to evolve within a framework of voluntary self-regulation, where the quality of services offered depends heavily on the individual commitment of individual professionals or their membership networks.

In summary, the quantitative and qualitative composition of the condominium management sector in Italy reflects a broad but fragile structure, based on a prevalence of micro-activities, a low level of professional aggregation, and strong territorial heterogeneity.

These factors impact not only the quality and continuity of services, but also management practices, the standardization of services offered, and the adoption of digital tools. This paves the way, as Garesio suggests in the article (Zanotti, 2022), for a progressive evolution toward more structured and multi-service organizational models, similar to those found in other European countries.

4.3.3.2 Characteristics and Implications of Prevalent Organizational Models in Italy

The range of organizational models characterizing the condominium administrator profession in Italy, which, as explained in the previous chapter, is characterized by strong heterogeneity and fragmentation, reflects both the historical structure of the sector and the regulatory complexities that have influenced its evolution nationally. This complexity manifests itself through the coexistence of very different entities, which can be classified into three main operational configurations: freelancers and small family firms, associated or condominium management companies, and, to a lesser extent, large-scale operators. Each of these models is characterized by different internal organizational models, management approaches, levels of digitalization, and service quality, with direct implications for the efficiency and sustainability of the entire management system.

Freelance Administrators e Small Family Firms

As highlighted in the previous section, the most widespread model in Italy is represented by freelancers or small family firms, often organized individually and with a limited portfolio of condominiums. This configuration is fundamentally based on a direct and personal relationship with condominium owners, in which the administrator assumes a central and almost exclusive role in operational and administrative decisions. This model ensures a close relationship that fosters direct knowledge of

residents' specific needs and a thorough attention to internal dynamics. However, it has significant limitations: first and foremost, the prevalence of reactive management rather than strategic planning of real estate assets, often due to limited resources, both human and technological. The low adoption of advanced digital tools is accompanied by difficulties in accessing ongoing training and professional development, which are essential for effectively responding to increasing regulations and administrative complexity (Grassi, 2010).

According to the study "Real Estate Services in Europe and the United States" (Gianasso, 2016a), this category of operators constitutes the majority of the Italian real estate services market for the residential sector, which suffers from high profit margins and a low level of capitalization. Indeed, the fragmentation of the sector and the lack of consolidated professional networks create a competitive environment based primarily on price, rather than service quality or innovation.

This situation is further exacerbated by fiscal and bureaucratic pressure, which often weighs heavily on these microstructures, reducing the possibility of investing in technology or qualified personnel. This situation leads to operational inefficiencies, poor process standardization, and vulnerability in addressing the new challenges posed by digitalization and environmental sustainability (Bucelli, 2018). The report "Real Estate Services in Europe and the United States" (Gianasso, 2016a) also highlights how Italy, compared to other European countries, shows a lower propensity to create "real estate service companies" in the strict sense, which, in the condominium context, could be interpreted as a lack of integrated condominium management with scheduled maintenance, energy management, and document management functions.

Associated companies and condominium management companies

A second model, growing but still a minority compared to the previous one, is represented by condominium management companies or associated firms. These organizations are characterized by greater internal specialization, with a clear division of administrative, accounting, technical, and communication functions. The adoption of integrated management software and structured operating procedures promotes more efficient and standardized management of information flows, improving the quality of services provided and the ability to promptly respond to regulatory and compliance requirements (Grassi, 2010).

According to the SCENARI IMMOBILIARI research (Gianasso, 2016a), these models represent a first step towards the "advanced real estate services company," an economic entity that goes beyond mere administration but provides a coordinated set of services related to the building's life cycle. However, the expansion of these entities still faces cultural and structural limitations: the lack of economies of scale, the low density of managed condominiums, and limited collaboration between professionals are hindering the sector's growth.

Furthermore, management companies tend to invest more in training and ongoing development, promoting a work culture more focused on quality and transparency towards condominium owners.

Despite this, their expansion often faces cultural obstacles, a still-fragmented market, and regulations that allow little room for economies of scale. The result is a slowdown in the assimilation of more modern organizational models and a difficulty in implementing advanced digitalization and management automation tools (Gianasso, 2016a).

Large-scale Operators and Hybrid Multi-Service Models

In complex urban contexts and large, multi-site developments, large-scale management companies are emerging that offer an innovative and integrated vision of condominium management. These operators, often organized as multi-service companies or franchises, integrate traditional management with

additional services such as facility management, building management, energy management, scheduled maintenance, and advanced digital support for residents. As emphasized by Garesio (Zanotti, 2022), CEO of Estia Spa, these companies represent a potential evolution of the traditional administrator role, moving toward a "multi-service spa" capable of offering coordinated, digitalized, and proactive management.

However, according to the SCENARI IMMOBILIARI report "Real Estate Services in Europe and the United States" (Gianasso, 2016a), an analysis of volumes and employment shows that Italy is competitive in some sectors related to real estate services, such as Facility Management and Property Management, but only in the commercial sector, and lags behind other countries in residential Property Management. Furthermore, despite recent improvements, there is still a significant gap compared to competing countries in terms of professionalization and market internationalization, with the professional management of residential assets representing the greatest shortcoming in the Italian market.

According to the data collected, France and Germany show a greater presence of structured companies, with a more marked balance between micro, small, and medium-sized enterprises, and especially with significantly larger groups managing integrated real estate portfolios. These countries have numerous multidimensional models and consolidated practices, such as "gestion immobilière intégrée" in France, which represents a comprehensive and digitalized form of management, while in Germany, Hausverwaltungen (house management companies) operate according to standardized models with high levels of automation and quality control.

The United Kingdom stands out for its more mature market, where the average company size is double the European average, and residential management is part of integrated and clearly professional property management models, including block management companies and property managers. These entities must meet very stringent regulatory and ethical requirements, thus ensuring strong professionalism and an advanced managerial approach.

A comparison with Europe highlights a substantially different nature of the Italian market, where the role of the administrator remains largely individual, without any significant organizational structures or integrated property management models having yet been consolidated. This situation limits the potential for technological development and the ability to implement efficient strategies on a larger scale, penalizing the competitiveness and overall quality of the service offered to condominiums (Bucelli, 2018; Grassi, 2010).

4.3.3.3 Management and Operational Implications of the Various Professional Models

The fragmentation and diversity of organizational models that characterize the Italian condominium administrator market generate significant implications at the management, operational, and strategic levels. In individual models or small family firms, decisions are often concentrated in the administrator, who maintains direct control over every operational aspect. While this approach ensures speed and a personal relationship with the condominium owners, it also reduces the capacity for strategic planning, process standardization, and operational resilience in the event of unforeseen circumstances. Communication tends to remain informal and unstructured, negatively impacting information traceability and administrative transparency. Furthermore, there is limited interoperability between operators and stakeholders and heavy workloads for individual administrators. Conversely, more structured entities (such as associated companies or multi-service models) adopt shared procedures, differentiated roles, and integrated digital platforms, which enable more efficient management, smoother communication with residents and suppliers, and greater interoperability with external stakeholders (Gattolin, 2023).

Organizational scale is also a determining factor in terms of digitalization: only medium- to large-sized operators have the resources necessary to implement integrated condominium management systems, CRM tools, accounting and tax management software, collaborative platforms, and energy monitoring software. According to Garesio (Zanotti, 2022), this evolution reflects an emerging market trend, in which "managing a condominium is like managing a company," with models increasingly focused on performance, transparency, and the strategic use of data. However, the capacity for technological investment remains strongly tied to the organization's size, deepening the gap between individual professionals and structured companies (Gattolin, 2023).

This fragmentation also leads to a reduction in economies of scale and bargaining power with suppliers. Administrators managing a limited number of condominiums have less room for negotiation and face higher costs for services and maintenance, while multi-service companies can benefit from discounts and favorable conditions thanks to the concentration of demand and the use of shared platforms, with savings ranging from 15% to 50% (Zanotti, 2022). Consequently, many condominiums managed by micro-operators, typically local, find themselves at a competitive disadvantage, with limited access to qualified suppliers and advanced digital tools.

Another critical issue concerns training and generational turnover. The sector has a high average age and a low rate of internal innovation, with training programs often left to individual initiative and not supported by a national accreditation system. As Grassi (2010) observes, the transition from an individual professional approach to a structured business model has not yet fully occurred, partly due to the lack of collaborative networks and a mandatory professional register that guarantees minimum standards of competence and updating. This lack limits the diffusion of managerial and digital skills, hindering the transition to more modern and integrated condominium management.

From a service quality perspective, organizational differences translate into uneven levels of operational continuity, transparency, and trust among condominium owners. In individual micro-offices, the relationship with users tends to be personalized but not very scalable, while in structured companies, process standardization and digitalization ensure greater management transparency, service continuity, and data security. Resident trust, a crucial element in condominium management, is therefore closely related to the level of professionalization, interoperability, and the ability to ensure clear and traceable communication between the administrator, suppliers, and condominium owners.

In this scenario, digitalization presents both a challenge and a crucial opportunity for the sector, capable of improving operational resilience and the quality of communication, but also of redefining the very role of the administrator as a managerial figure and service coordinator. The evolution towards more professionalized, integrated, and technologically advanced models therefore appears inevitable to ensure the efficiency and sustainability of the system, fostering a balance between service customization and the adoption of modern management standards, in line with the consolidated experiences of the most advanced European markets.

4.3.3.4 Emerging trends and professional evolution

As explained in the previous paragraphs, in recent years the condominium management sector in Italy has been undergoing a phase of structural transition that reflects both the socioeconomic transformations of the real estate sector and the digitalization and professionalization processes underway in the broader context of building services. While the market remains highly fragmented, characterized by the prevalence of freelancers and small, family-run firms, there is a progressive trend toward more integrated, cooperative, and specialized forms of organization.

One of the most significant developments is the emergence of association networks, consortia, and franchising systems, which aim to overcome the traditional management isolation of the individual administrator. These networks, promoted by both trade associations and private initiatives, enable the sharing of technological tools, standardized procedures, and consulting services, offering training and operational support that fosters professional qualification (Grassi, 2010). This process responds to the growing technical, regulatory, and relational complexity of condominium management, requiring skills ranging from real estate law to energy efficiency to digital communication with users. According to Grassi (2010)., the growing market concentration and the resulting professionalization of the role will lead, even in Italy, to a progressive expansion of associated firms and companies managing larger property portfolios, introducing managerial approaches and investing in integrated management software.

Furthermore, the trend toward outsourcing specialized functions, such as accounting, technical maintenance, claims management, or the implementation of digital communication platforms, is gaining ground. This process, already consolidated in other segments of facility and property management, allows management firms to focus on higher value-added activities and improve overall efficiency. The SCENARI IMMOBILIARI report (Gianasso, 2016a) highlights how the adoption of hybrid organizational models and collaboration with external service providers are an increasingly widespread strategy. This solution has already been partially adopted in some contexts, particularly in urban contexts and large condominiums, where the demand for technical and administrative skills is higher.

At the same time, however, we are witnessing a shift toward multi-service models, in which condominium management becomes part of a broader integrated property management offering. As Garesio, CEO of Estia, emphasized in an interview with La Stampa (Zanotti, 2022), "the condominium administrator will become a multi-service company that also handles bills." This approach reflects the desire to create structured operators capable of coordinating a range of services, from energy management to predictive maintenance to assistance for the resident community. The evolution toward these models, which are closer to those already established in the relevant European markets, represents a potential turning point for the competitiveness and sustainability of the sector.

In summary, the emerging picture outlines a progressive transformation of the professional profile of the condominium administrator, increasingly oriented towards collaboration, technological innovation, and integrated management of services. Developing skills, adopting more structured organizational models, and fostering interprofessional collaboration are key levers for creating a more efficient and transparent management system geared toward improving the quality of life in condominiums.

4.3.4 Professional Identity and Relationship with Residents and Service Providers

As explained in the previous chapter, the evolution of the residential real estate and condominium services market is redefining the professional profile of the administrator, who can no longer be limited to administrative and accounting functions but must assume a much broader managerial and relational role. Indeed, they must combine their professional identity with the role of mediator between competing interests: on the one hand, the condominium residents, with their needs and legitimate expectations of transparency, participation, and speed; on the other, service providers (maintenance personnel, technicians, contractors, etc.) who require clarity, planning, and stable contracts.

One of the main critical issues facing the administrator on a daily basis concerns managing relationships with residents, who nowadays demand prompt response to their requests and transparency in condominium management. As highlighted by the CENSIS-ANACI report (ANACI & Censis Servizi, 2010), condominium owners' top priority is the administrator's ability to "respond

promptly and promptly," followed by a reasonable fee, prompt implementation of assembly resolutions, and, only lastly, a guarantee for the funds managed on behalf of the condominium owners (*Figure 58*).

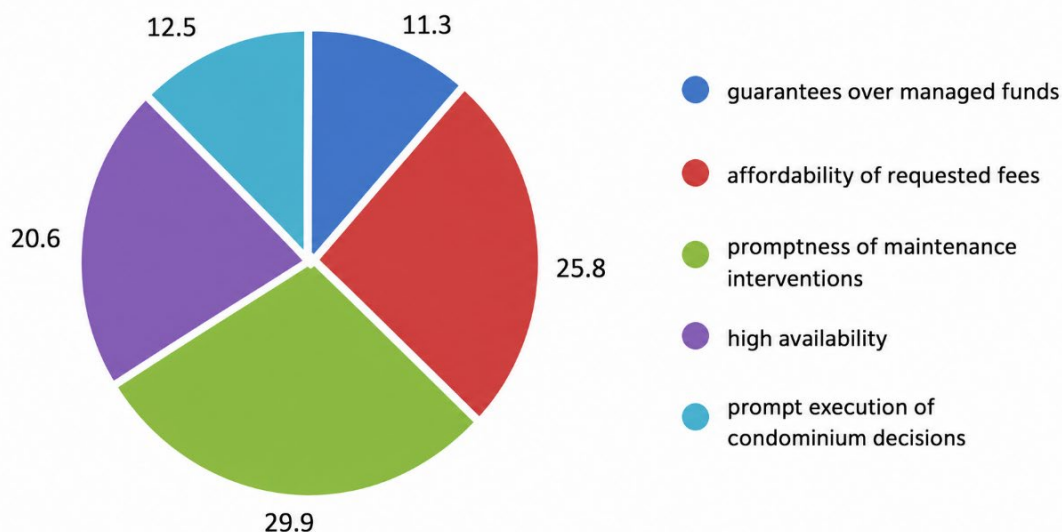


Figure 59: Main requests from condominium owners (ANACI & Censis Servizi, 2010). Source: ANACI & Censis Servizi, 2010

Therefore, the administrator is increasingly required to ensure rapid response times, listen to individual needs, and resolve minor daily conflicts. In many cases, the pressure of urgent requests, combined with the requirement to operate within budgetary constraints, can limit the administrator's ability to develop structured and shared responses, making it difficult for residents to understand the technical or financial rationale behind certain decisions. At the same time, expectations regarding transparency and participation have grown: condominium owners demand clear reporting, easily accessible documentation, and participation in the decision-making process.

In fact, while in the past the administrator was always subject to mistrust and conflict with condominium members, their role is now increasingly being compared to that of community manager, as a good administrator is also expected to facilitate the day-to-day management of the building, supporting residents and promoting cohesion through shared initiatives. As highlighted by studies such as that of ASSOIMMOBILIARE (Confindustria Assoimmobiliare, 2025), the ability to facilitate participatory decision-making processes and enhance the community dimension of the condominium is now a key factor in the quality of service. Therefore, a modern condominium administrator, in addition to having multidisciplinary skills, must possess interpersonal, social mediation, and conflict management skills, which nowadays are as important as their technical and administrative ones. Relationships with residents remain a critical issue in condominium management: information asymmetry, perceived lack of transparency, and communication difficulties, which fuel mistrust and misunderstanding, are the main obstacles that must be overcome to ensure higher quality service delivery.

The growing complexity of relationships with condominium owners is compounded by the need to effectively manage service providers. Administrators cannot fully delegate supervision of construction work, but must systematically plan, monitor, and evaluate various types of interventions. This requires expertise ranging from technical assessment to negotiation skills, all the way to the establishment of transparent governance to avoid overlapping responsibilities and conflicts of interest. In many cases, they find themselves having to balance the condominium owners' need to contain costs with the need to ensure quality services. This "double-bind relationship" certainly represents one of the greatest

challenges: the administrator must be the guarantor of the condominium owners, but also a credible interlocutor for businesses, adopting structured contracts, employing, for example, SLAs or shared benchmarking procedures. The ability to implement monitoring systems based on KPIs, user feedback, and satisfaction surveys becomes a fundamental practice for ensuring high standards (Grassi, 2010).

Another critical issue stems from the fragmentation of the condominium supply market: unlike the tertiary sector, where multi-service companies operate, in the residential context, services are often outsourced to multiple different operators. This situation places a significant management and administrative burden on the administrator, who must coordinate multiple entities, manage differing tax burdens, and address a general lack of shared procedural standards (Grassi, 2010). This results in a lack of ability to optimize the services offered, and paradoxically, the situation is even more complex in new condominiums, as the presence of new technologies, spaces, and services within them requires even more careful management and monitoring.

In this scenario, the administrator is increasingly involved in activities to promote the value of the property, especially in light of European directives, particularly those relating to energy efficiency. Therefore, they must also be able to coordinate complex interventions, support residents in making energy efficiency decisions, and identify sustainable and financially advantageous solutions. From this perspective, it's no longer just a matter of planning and monitoring the building's routine maintenance, but of preserving the building's assets over time. As Caruso, president of ANACI Milano, emphasized, the role of the administrator has shifted "from simply managing systems and services" to "promoting the building's overall value" (Venunzio, 2025).

It's worth noting that significant support can come from digitalization processes: condominium portals, ticketing systems, consumption dashboards, and digital archives can improve operational efficiency and transparency, facilitate communication, and reduce the distance between the administrator and residents. However, these tools require technological expertise, time dedicated to managing information flows, and particular attention to data security. Furthermore, while these channels foster and facilitate dialogue, they also introduce the risk of a "digital divide" between those who use the tools and those who are excluded from their use, especially among elderly residents (Venunzio, 2025).

In summary, the quality of the relationship with residents and suppliers today represents one of the most crucial elements of the administrator's professionalism. The ability to communicate clearly, coordinate technical interventions, mediate conflicts, and foster innovation not only impacts management effectiveness but also defines the perceived value of the service. In a changing context, cooperation with condominium owners and supplier governance therefore become strategic levers for building a more efficient, sustainable, and community-oriented condominium system.

4.3.5 Opportunities and Challenges for Condominium Manager

The role of the condominium manager appears increasingly shaped by the need to balance administrative, technical, and relational responsibilities within a context of growing regulatory complexity. They have to guarantee rapid responses, continuous availability, transparency and participation, while at the same time orchestrating complex networks of suppliers and services in a fragmented market, reconciling cost containment with service quality and managing heterogeneous contracts. These responsibilities are further compounded by the need to plan and implement energy retrofits and sustainability projects under tight regulatory, financial and organizational constraints, often amid conflicts of interest and unequal investment capacities among residents. Training gaps, an ageing professional population, and the absence of a mandatory national register and unified professional standards risk reinforcing uneven service quality and slowing down the adoption of more innovative, data-driven and service-oriented management practices.

At the same time, these challenges open concrete opportunities to reposition the administrator as a hybrid governance and management professional, closer to property, building and facility managers, supported by stronger institutional recognition and progressive professionalization through training and trade associations. The emergence of associated firms, consortia, franchising networks and multi-service companies offers the possibility to achieve economies of scale, share specialized functions and invest in technology, standardized processes and structured supplier governance models based on SLAs, KPIs and feedback systems. Finally, the diffusion of digital management platforms, portals, ticketing systems and monitoring dashboards can automate routine tasks, enhance transparency and communication with residents, and strengthen the administrator's strategic role in promoting energy efficiency, safeguarding property value and improving the overall quality of condominium life.

Diagram 5 summarizes the key challenges and opportunities related to the evolving role of condominium managers, highlighting both operational and relational dimensions.

4.3 CHALLENGES AND OPPORTUNITIES RELATED TO CONDOMINIUM MANAGERS

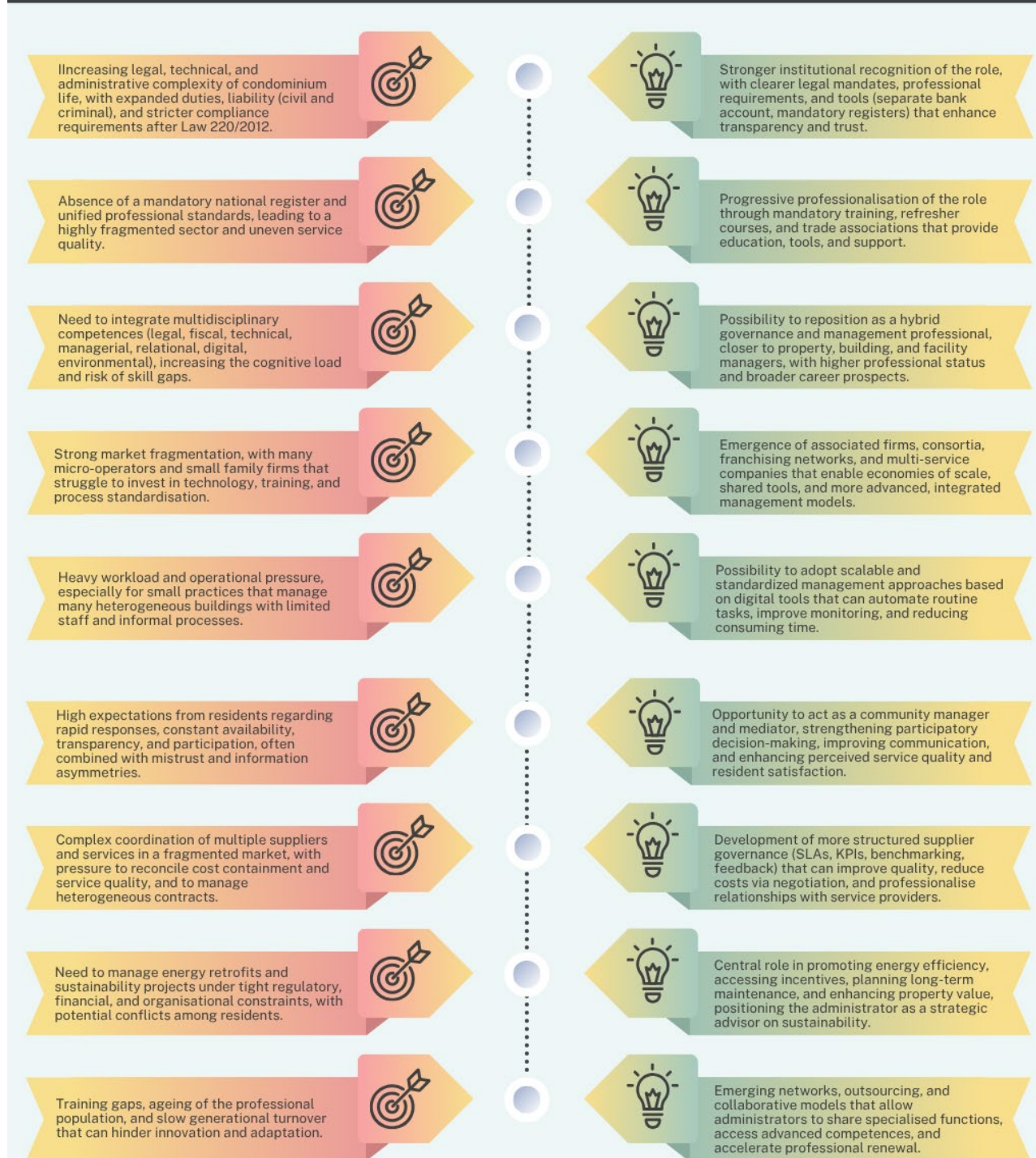


Diagram 5: Main challenges and opportunities of condominium managers. Source: Own Elaboration

4.4 Service Providers of Condominium Services: Operational Management and Recurring Inefficiencies

The efficient functioning of a condominium increasingly depends on a wide and diversified ecosystem of external service providers. These actors, ranging from maintenance companies and cleaning firms to specialized technicians, utility suppliers, and emerging digital service platforms, play a fundamental role in supporting the daily operations, safety, and long-term value of residential buildings. While traditionally considered as independent contractors operating under the direction of the property or condominium manager, their role has expanded over time as condominium buildings have become more technologically complex, more energy-efficient, and more service-oriented.

This chapter analyses the main characteristics of condominium service providers, focusing on their functions, organizational models, and the type of services they deliver. Particular attention is dedicated to the specificities of the Italian context, where the market structure of service provision remains highly fragmented and dominated by local small and medium-sized enterprises, compared with more integrated and professionalized models observable in several European countries. Finally, the chapter also examines the interaction between service providers, condominium managers, and residents, highlighting coordination mechanisms and contractual relationships.

The chapter identifies the main challenges that service providers face, as well as the opportunities emerging from technological innovation and the growing demand for integrated and higher-quality residential services. Together, these elements provide a comprehensive overview of the current landscape of condominium service provision and its evolving role within the broader residential real estate ecosystem.

4.4.1 Definition and Types of Service Providers in the Residential Sector

Service providers in the condominium context can be defined as external organizations or professionals responsible for delivering operational, technical, and support services that ensure the functioning, safety, and livability of residential buildings. Unlike property managers or condominium administrators, whose role is primarily managerial and coordinative, service providers carry out the practical execution of activities in order to support the everyday functioning of shared spaces, utilities, and building systems, as well as services directly benefiting residents. In the Italian residential sector, these actors are typically freelancers, independent contractors or small and medium-sized enterprises operating under service agreements regulated by condominium assemblies and executed through the administrator (Grassi, 2010).

Based on a review of academic literature, sectoral reports, and professional guidelines on residential services, facility management, and condominium governance, this study adopts an analytical classification of residential service providers aimed at capturing the main operational and organizational functions within condominium environments. To better delineate their scope and functions, residential service providers can be grouped into four broad categories that mirror the operational and governance needs of condominium environments.

A first group includes providers responsible for maintenance of the building fabric, whose activities safeguard the physical integrity, efficiency, and overall condition of the property. This category encompasses a wide range of services, from the maintenance of technical systems, such as electrical and hydraulic installations, HVAC systems, fire safety equipment, lifts, CCTV, and access control, to more structural or building-related works, including masonry repairs, façade restoration, painting, waterproofing, and sewer or waste pipe cleaning. It also comprises maintenance of shared amenities,

like swimming pools, gyms, playgrounds, and other recreational areas, as well as general upkeep tasks such as gardening, landscaping, cleaning services, waste management and pest control. Collectively, these providers help ensure regulatory compliance, extend the durability of the asset, and reduce long-term deterioration risks.

A second group is composed of those who supply consumable goods and utilities necessary for the everyday functioning of both the building and individual units. This includes the provision of water, electricity, heating fuels or district heating connections, and telecommunications services. As digital technologies have become more pervasive, the role of these providers has evolved, with IoT-based monitoring systems, energy-monitoring platforms, access-control systems and PropTech solutions that facilitate interactions between residents, administrators, and service providers and increase the life quality of the final users.

The third category relates to providers delivering personal or community services, which focus on supporting residents directly and enhancing comfort, safety, and community life. Typical examples include concierge and reception services, physical or digital security and surveillance, and parcel management or access control solutions.

Finally, a fourth group includes providers offering professional, technical, and regulatory services, whose activities support the condominium in complying with legal, administrative, and fiscal requirements. This category comprises energy and safety certifiers, technical, legal, fiscal, and financial consultants, insurance companies, as well as auditors and other compliance specialists. These actors often interact closely with condominium managers, and their role becomes especially significant in complex or mixed-tenure buildings where regulatory compliance demands specialized expertise.

To further interpret the diversity of residential service providers, the “*pyramid of facility management supply*”, proposed in the facility management literature (Andrea Ciaramella & Oliviero Tronconi, 2006), has been adapted to the Italian condominium context. While originally developed for commercial and corporate facilities, the model is here used as an interpretative framework to classify providers according to the scope and complexity of the services they deliver. Importantly, this segmentation does not imply a hierarchy of quality: high-performing and underperforming firms can be found at every level of the pyramid. Rather, its purpose is to clarify the different organizational logics that shape how providers operate within residential buildings.

At the base of the pyramid are *partial suppliers*: small or highly specialized firms that deliver one or a limited set of services such as plumbing, gardening, minor repairs, or routine cleaning. These providers typically work with a strong operational focus, intervening on specific issues without managing broader processes or cross-service coordination. Their role is crucial in condominiums, where maintenance needs are frequent and fragmented.

The middle tier consists of *sector-based suppliers*, organizations that manage an entire service domain through vertical integration. In the residential sector, this may include energy management companies overseeing fuel procurement, boiler maintenance, energy monitoring, and system operation, or security firms providing both personnel and digital surveillance solutions. These companies usually possess substantial technical know-how and operate at medium to large scale. However, their expertise remains concentrated in a single field, and they generally lack the organizational capacity to manage a wider portfolio of heterogeneous services.

At the top of the pyramid are the *large integrated operators*, comparable to Total Facility Management providers in the commercial sector. These firms are able to coordinate a broad set of services, often through a mix of in-house resources and subcontracting, while relying on advanced information

systems and structured organizational processes. Although not yet widespread in the residential market, their presence is growing, particularly in large housing estates and professionally managed portfolios. These operators can act as strategic partners for administrators, offering flexible service packages and adapting the service mix to evolving resident needs, similar to Global Service arrangements in the FM domain.

Table 5 summaries this adaptation, mapping the three levels of the FM supply pyramid onto typical residential service configurations.

FM supply pyramid level	Adapted category in condominiums	Typical services in condominium context	Typical provider profile
Base – Partial suppliers	Single-service or highly specialized contractors	Plumbing, gardening, routine cleaning, minor repairs, specific plant maintenance	Freelancers, micro-enterprises, small local firms
Middle – Sector-based suppliers	Domain-specific operators managing an entire service area	Energy management (fuel procurement, boiler operation, energy monitoring), security (guards and CCTV), telecommunications and connectivity	Medium to large specialized companies with strong technical know-how
Top – Large integrated operators	Integrated residential service providers coordinating multiple services	Multi-service packages for large housing estates, social housing portfolios, co-living or senior housing schemes (maintenance, hospitality, soft services, digital platforms)	Large FM or Global Service operators acting as strategic partners for administrators

Table 5: Adaptation of “pyramid of facility management supply” to the Italian condominium service ecosystem.. Source: Own Elaboration

This three-tier classification provides a clearer understanding of the diversity within the residential service ecosystem and highlights the varying levels of integration, coordination capacity, and technological maturity that characterize the providers operating in condominium management. The emerging residential models tend to require sector-based or integrated providers capable of provide multiple services rather than relying solely on partial suppliers. This trend also affect the condominium context, with the evolution towards a more integrated and service-centric models of services provision.

It is important to notice tant, over the past decade, the role of service providers has expanded significantly due to changes in housing models and residents’ expectations. Contemporary residential formats, such as co-living, senior housing, student housing, and social housing, rely on a more structured and continuous provision of services, often requiring integrated and multi-disciplinary service packages rather than isolated interventions (PwC & Urban Land Institute, 2024b). In co-living and student residences, for instance, service providers can contribute to value creation by supporting hospitality-oriented models, communal amenities, and high digital connectivity. In senior housing, providers can deliver not only building maintenance but also safety monitoring, accessibility-related adaptations, and welfare-oriented services, aligning with broader trends in inclusive and assistive living environments. In social housing, service providers often collaborate with social managers to support community well-being, maintenance efficiency, and affordability of services.

This evolution reflects a broader shift from a fragmented, task-based approach, historically dominant in the Italian context, to a more integrated, service-centric model aligned with European trends in facility and property management. Although Italy still remains characterized by a prevalence of micro-enterprises and low levels of service integration, the growing complexity of residential buildings and the increasing adoption of digital technologies are progressively redefining the role of service providers, positioning them as essential actors in the long-term sustainability, efficiency, and social value of condominium environments.

4.4.2 The Italian Peculiarities Compared to the European Context in the Provision of Condominium Services

As described in the previous chapters, the Italian residential services landscape displays several structural and operational peculiarities that differentiate it from the more standardized and institutionally consolidated models found across Europe. These differences originate from historical, regulatory, and market-specific factors that have shaped a highly fragmented ecosystem, characterized by micro-enterprises, reliance on personal networks, and limited integration of digital and facility management (FM) practices (Grassi, 2010).

One of the most distinctive traits of the Italian system is its extreme fragmentation. Most service providers operating in condominium environments, whether technical, soft-service, or utility-related, are small or very small firms, often local or family-run businesses with a narrow service portfolio. According to sectoral analyses (Gianasso, 2016b), this structure leads to high informality in contracting and coordination, limited economies of scale, low investment capacity, and reactive rather than preventive service models, resulting in variability in quality and weak standardization. This situation contrasts sharply with many European markets, where larger and more structured multi-service companies dominate, supported by higher professionalization and service consolidation.

Furthermore, while integrated FM has become a consolidated model in commercial, corporate, and public buildings across Europe, its adoption in the Italian residential sector remains marginal. As noted by Grassi (2010), condominium governance is still largely based on single-service contracts, short-term engagements, and reliance on pre-existing networks of trusted local contractors. By contrast, countries such as Germany, France, and the UK increasingly employ integrated or semi-integrated FM models for large rental portfolios, social housing, and cooperative housing associations (Gianasso, 2016b). These models ensure greater operational efficiency, transparency, and unified performance monitoring (elements still largely absent in Italy).

Regulation further contributes to distinguishing the Italian context. The Civil Code and Law n. 220/2012 precisely define the administrator's roles and liabilities, rules for provider selection, and financial reporting obligations. While these provisions strengthen resident protection, they also reduce flexibility in procurement and limit the adoption of innovative contractual forms commonly used in Europe, such as performance-based agreements, multi-year FM contracts, or energy-service partnerships. In several European countries, property managers operate within more standardized procurement frameworks, and resident associations or institutional landlords maintain stronger oversight, reducing information asymmetries and increasing transparency. Germany represents a clear example, with professional Hausverwaltungen, a consistent use of multi-service providers, and established benchmarking systems for cost and performance efficiency. Similarly, France features large nationwide property management firms, clearer contractual standards, compulsory reporting mechanisms, and higher use of integrated service models in large copropriétés. Therefore, while the types of services provided do not differ substantially from Italy (with the exception of particularly exclusive buildings or specific residential uses) the major discrepancies concern selection procedures, contractual models, and management processes.

Another key peculiarity of the Italian condominium sector is the central role of the administrator as mediator and gatekeeper between residents and suppliers. Due to the structure of Italian law (Civil Code, arts. 1129–1138), administrators are responsible for selecting and supervising providers, managing contracts and budgets, ensuring compliance, and controlling information flows. This concentration of authority ensures clear accountability but also entails risks, such as dependence on personal networks, information asymmetries, and limited contestability (Grassi, 2010). The diversity and technical complexity of condominium services further complicate the administrator's tasks: a

single manager cannot realistically possess expertise across all operational domains while simultaneously ensuring competent supplier selection and oversight. Administrative and fiscal responsibilities add to this burden. Grassi's research (2010) reports that a sample of 70 condominiums relied on over 200 suppliers (an average of three per building) highlighting the magnitude of contract handling, tax reporting, and coordination activities.

Unlike in several foreign contexts, Italian administrators are generally prohibited from delivering services directly with their own personnel. Doing so could create conflicts of interest, particularly in cases where the administrator may act without prior assembly authorization. When such conflicts arise, the Civil Code (art. 1129) allows residents or courts to revoke the administrator and, in cases of economic damage, seek criminal liability. Despite managing on average 20-25 buildings and interacting with a highly fragmented supplier network, selection processes remain informal: competitive tenders, framework agreements, and portfolio-wide procurement strategies are rarely adopted. Consequently, the considerable purchasing power generated by aggregated building portfolios remains largely untapped. Additionally, services targeted at the direct management of individual residential units - potentially representing a parallel line of business - remain limited.

As mentioned earlier, this fragmentation leads to several consequences: administrators rely on numerous providers, sometimes multiple companies for the same service; contract management fails to become a strategic tool; economies of scale are not realized; and suppliers rarely have opportunities to offer multi-building or long-term solutions. As proposed by Grassi (2010), in his thesis, to address these inefficiencies one solution could be the creation of condominium purchasing centers. By aggregating demand across buildings managed by the same administrator or administrator network, such centers could reduce the number of suppliers, streamline administrative processes, and enhance bargaining power. However, implementation is complex, as it requires formal approval from the assemblies of each participating condominium.

A similar model has been applied in the sector by some companies, which leverage the purchasing power of its network of administrators to negotiate more favorable agreements with major service providers, particularly in insurance, banking, and energy industries. To extend this system across the entire condominium supply chain, importing specific contractual tools from commercial building management would be necessary.

A second potential evolution concerns the supply side, promoting the emergence of multi-service providers capable of offering a broad and integrated range of services. Currently, both Italian and foreign residential markets show a predominance of operators active mainly in the energy sector, which represents the largest expenditure area and offers the most attractive margins. This specialization, however, limits the development of comprehensive integration and increases the relational and managerial complexity faced by administrators. Drawing inspiration from the commercial real estate sector, where integrated FM providers already operate, multi-service companies could act as a single operational interface for administrators, simplifying coordination and enabling more proactive asset management. From a systemic perspective, these providers could operate in synergy with a purchasing center, extending services both to entire portfolios and individual owners (Grassi, 2010). In cases where administrators lack advanced organizational systems, such companies could also introduce standardized maintenance procedures and coordination practices.

Finally, compared to Northern and Western Europe, Italy exhibits slower adoption of digital tools for coordination, monitoring, and communication. While PropTech platforms for ticketing, maintenance tracking, and resident communication are developing, their diffusion remains uneven and primarily limited to professionally managed rental schemes, newly built large condominiums, and social housing operators involved in EU-funded innovation projects. In Northern Europe, by contrast, the diffusion of digital building logs, IoT-based monitoring systems, real-time dashboards, and resident engagement

apps is far more widespread, supported by strong institutional landlords and stricter regulatory frameworks for maintenance. Despite recent progress toward more structured models, Italy continues to lag behind its European counterparts. National and international companies operating in the country often rely on local operators for territorial coverage, resulting in limited integration and weak management continuity. This structural delay generates inefficiencies and translates into lower average turnover per employee compared to France, Germany, and the UK, where higher professionalization enables economies of scale and sustained technological investment (Gianasso, 2016b).

4.4.3 Interactions between Service Providers, Condominium Administrator and Residents

Interactions between service providers, condominium administrators, and residents form the operational backbone of residential service delivery. Yet, in the Italian context, these interactions are marked by fragmented communication, limited standardization, and a high degree of dependency on individual actors. Unlike Northern European models, where clear procedures, digital platforms, and multi-service operators streamline coordination, the Italian system relies heavily on informal exchanges and personal practices (Grassi, 2010). This section explores these dynamics through the perspective of service providers, first examining their relationship with administrators and then their direct and indirect interactions with residents, with the aim of analyzing the main critical issues encountered among the parties involved.

4.4.3.1 Supplier–Administrator Operational Relationship

As explained in the previous chapter, for service providers, the administrator is the main institutional interface and the gate through which almost every operation passes. This relationship is crucial, but also challenging, because it is shaped by fluid communication, bureaucratic constraints, and information gaps that complicate even routine activities.

Analyzing the operational models of interaction, suppliers typically receive requests, authorizations, and clarifications through a mix of highly diverse and often informal communication channels. Email remains the most common tool, but many interactions occur through phone calls, WhatsApp messages, PDFs or Excel sheets shared on the fly, and, in some cases, supplier-specific platforms. Administrators adopt different habits and tools depending on their organizational maturity, with small local practices tending to rely on improvised or analogue solutions (Grassi, 2010). The result is a very fragmented communication environment. Information may be scattered across channels, forwarded multiple times, or lost in message threads. Suppliers frequently report that they must reconstruct the history of a request by checking emails, phone notes, and documents that were shared inconsistently. The best solution could be to use a single channel, which could be, for example, a dedicated digital platform, so as to have a single channel of communication between the parties involved, collect all tickets issued, and create a direct channel through which to share all information.

Another defining feature of the relationship is the strong dependency on administrative approval. Except in true emergencies, no intervention can begin without the administrator's explicit go-ahead (DANEA, 2025). This creates several practical consequences. Suppliers often face long waiting times because administrators need to check costs, consult with the building council, or verify budget availability. Schedules become hard to predict, as teams cannot be assigned until confirmations arrive. When instructions change or additional details are provided late, suppliers may need to reschedule, revisit or partially redo previous work. From the supplier's viewpoint, this dependency reduces operational stability and leads to inefficiencies: teams may be underutilized, planning becomes

reactive, and small delays accumulate, resulting in work overloads and greater complexity of intervention.

Because administrators mediate between residents and suppliers, the information that reaches contractors is not always complete or up to date. Providers often struggle to obtain technical details about the issue at hand, historical maintenance records, updated plans, or logistical information such as access points or time restrictions. In many cases, suppliers must conduct preliminary inspections or exchange multiple clarification messages before they can even begin the intervention. This informational asymmetry is one of the most frequent challenges and contributes significantly to delays and misunderstandings. To solve this problem, it is necessary to create, from the outset of the administration contract, an organized and shared archive containing the most relevant documents, drawings, and certifications to facilitate suppliers' operations, enabling them to respond quickly and efficiently and to keep track of the history of activities at all times, distinguishing between work in progress and completed work (DANEA, 2025).

Another important issue is related to the coordination and scheduling of interventions, especially in multi-unit buildings. As a matter of fact, suppliers must manage access to technical rooms, coordinate with custodians where present, retrieve keys or badges, comply with noise and work-hour restrictions, and negotiate residents' availability. Moreover, each building may have different rules and procedures, and suppliers working across many condominiums must adapt to these variations daily. Logistical constraints can also make route planning difficult. Technicians may need to return multiple times because access was not granted, or because the administrator had not provided the necessary authorization or information in time. A possible solution lies in the adoption of a centralized coordination platform that integrates access management, scheduling, and communication among actors. Such a tool can significantly reduce failed interventions, improve route optimization, and enhance overall operational efficiency.

All the dynamics outlined above create several recurring issues across the sector. Delays are common, especially during seasonal peaks such as heating system activation periods. Suppliers often experience information overload and difficulty in identifying priorities, especially when administrators forward requests without a clear triage process. Differences between condominiums, even those managed by the same administrator, force suppliers to continuously adjust their procedures. For these reasons, the use of KPIs, SLAs, or standardized workflows could be useful for monitoring performance and identifying inefficiencies, ultimately reducing operating costs (Grassi, 2010).

Overall, it can be said that the relationship between providers and administrators in Italy remains characterized by dependency, limited transparency, and fragmented operational processes. These structural limitations represent one of the main obstacles to the provision of residential services in Italy.

4.4.3.2 Supplier–Resident Relationship

Although administrators act as intermediaries, residents remain the end users of the services and the source of most maintenance and service requests. Suppliers therefore interact with residents, directly or indirectly, through dynamics that are often inconsistent and difficult to manage.

In most cases, communication between suppliers and residents occurs through the administrator. While this avoids uncoordinated exchanges, it often produces delays and incomplete information. Residents may send multiple reports across different channels, generating duplicate requests. Conversely, suppliers may receive only partial descriptions of the problem, leading to misunderstandings and repeat inspections. Indirect communication also makes it difficult to manage expectations. Residents may expect immediate responses, while suppliers are bound to wait for the administrator's authorization. Also, for this reason and in order to improve the communication flow, a

possible solution could be the creation of a single channel of communication in which direct interactions between residents and service providers are possible.

As explained above, the logistical coordination is a delicate task, especially when technicians must access private units: residents may be unavailable, cancel last minute, or fail to provide access despite previous agreements. For urgent interventions, such as water leaks or electrical faults, the problem becomes even more complex, as timing is crucial and multiple actors must be involved quickly. In multi-building portfolios, suppliers must coordinate many appointments across different locations. Each building may have different rules, access systems, or habits among residents.

Another important aspect that must be taken into account is the fact that residents do not have homogeneous expectations. Some expect rapid, near-real-time interventions; others focus on cost transparency or minimal intrusion. Age, familiarity with digital tools, and previous experiences with maintenance services all shape expectations. This variability influences how residents perceive service quality and can generate dissatisfaction even when the technical work is properly executed. Therefore, it is advisable to conduct surveys to assess customer satisfaction with the quality of services provided and how they are delivered.

Ultimately, suppliers directly influence the quality of residents' living experience. Their responsiveness, clarity of communication, and professionalism shape the atmosphere of trust within the building. For this reason, suppliers are not merely contractors, but essential co-producers of residential well-being and perceived value.

In summary, the supplier-resident relationship in Italian condominiums is marked by indirect communication, logistical hurdles, and mismatched expectations, amplifying inefficiencies despite suppliers' pivotal role in service delivery. Enhancing direct feedback and digital coordination could transform suppliers from mere executors into true partners in resident satisfaction and building harmony.

4.4.4 Opportunities and Challenges for Service Providers

Service providers operating in the condominium sector function within a highly fragmented and largely price-driven market, dominated by micro and small enterprises that limit economies of scale and long-term investment in more advanced service models. The prevalence of single-service, task-based contracts, and intense competition on low margins, reinforces short-term engagements, discourages preventive maintenance, and makes systematic performance monitoring still relatively rare. On an operational level, providers face complex logistics in multi-unit buildings, fragmented and informal communication channels, and heterogeneous condominium rules and practices, which generate information losses, duplicated requests, failed appointments, and difficulties in aligning interventions with residents' expectations. Limited access to updated technical documentation and to structured maintenance histories further constrains efficiency, often forcing additional inspections and iterative clarifications before works can be completed.

At the same time, these criticalities open concrete opportunities for a progressive repositioning of service providers within the condominium ecosystem. Growing demand for integrated, higher-quality and more continuous residential services, also driven by new residential formats, creates space for multi-service and sector-specialized operators able to offer bundled services and more strategic contributions to building management. The potential development of purchasing centers and portfolio-wide agreements negotiated through administrator networks can enable more innovative contractual forms, support the introduction of formal quality standards, KPIs, SLAs and customer-satisfaction monitoring, and favor providers that invest in reliability and professionalization.

Finally, the adoption of shared digital platforms for scheduling, access management, communication and data-sharing can improve planning, reduce coordination problems, and, ultimately, support more transparent, accountable and value-oriented service provision in condominium contexts. *Diagram 6* summarizes the key challenges and opportunities affecting service providers operating in the condominium sector.



Diagram 6: Main challenges and opportunities of service providers. Source: Own Elaboration

4.5 Cross-Cutting Challenges and Implications for Condominium

In conclusion, the analysis developed in this chapter highlights how the condominium must be interpreted as a condominium ecosystem, where technical, economic, social, and relational dimensions are tightly interconnected and cannot be reduced to a purely administrative or legal function. Residents, condominium managers, and service providers operate within a highly interdependent system, where inefficiencies or misalignments affecting one actor inevitably reverberate across the entire condominium environment.

Across the four perspectives examined, several recurring challenges emerge. These include fragmented communication channels, information asymmetries between stakeholders, limited transparency in service delivery and cost management, and the increasing complexity of coordinating multiple service providers within a fragmented market structure. At the same time, rising expectations regarding service quality, responsiveness, sustainability, and participation place additional pressure on traditional condominium models, often revealing their structural limitations.

To synthesize these dynamics, the following diagram (*Diagram 7*) illustrates the overlapping challenges experienced by residents, condominium managers, and service providers within the condominium context. The areas of intersection highlight systemic issues (such as communication inefficiencies, information asymmetry, and coordination complexity) that affect the governance of residential buildings as a whole, emphasizing how many of the observed criticalities emerge at the level of stakeholder interactions rather than within individual actors.

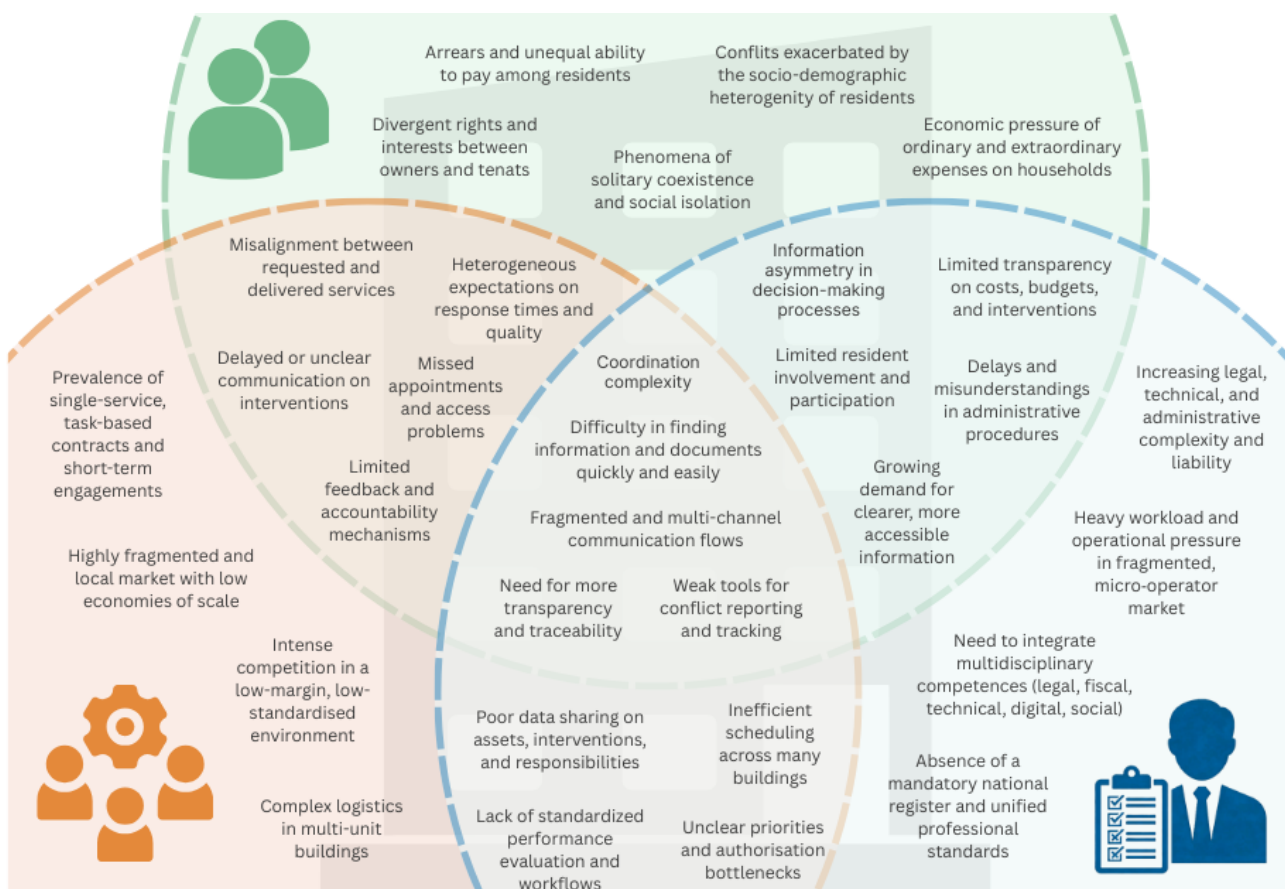


Diagram 7: Main individual and shared challenges among key condominium stakeholders. Source: Own Elaboration

Alongside these criticalities, the chapter also identifies significant opportunities. Growing awareness among residents, the evolving professionalization of condominium managers, and the gradual transformation of service providers towards more structured and integrated operational models signal a system in transition. In particular, the need for shared information environments, standardized processes, and more direct and traceable communication emerges as a common priority across all stakeholders.

These findings suggest that many of the challenges observed are not merely organizational or relational in nature, but are closely linked to the absence of adequate tools capable of supporting coordination, transparency, and informed decision-making. In this sense, digitalization does not represent a peripheral innovation, but rather a structural lever for reconfiguring condominium governance and structure.

Building on this analytical framework, Chapter “5. *Digitalization as a driver of change in the condominium context*” will explore digitalization as a driver of change in the condominium context. It will examine how digital platforms, management software, communication tools, and smart building technologies can respond to the critical issues identified in this chapter, enabling more efficient processes, strengthening trust among stakeholders, and supporting the evolution towards a more sustainable and inclusive condominium model.

5. Digitalization as a Driver of Change in the Condominium Context

Building on the previous chapters, the condominium can be interpreted as a fragmented micro-service ecosystem and stakeholder network, where a variety of actors, mainly residents, condominium managers, and service providers, interact around a shared physical infrastructure, but through poorly coordinated processes and communication channels. These actors bring partially divergent objectives, responsibilities, and information endowments: owners and tenants differ in their time horizons and service expectations; administrators operate as the main coordination node in an increasingly complex mandate; service providers are engaged through episodic and fragmented arrangements that limit traceability and accountability. As Chapter “4. *The Italian Condominium context: Physical Structure and Stakeholder Needs*” has shown, this configuration generates recurrent problems, especially of information asymmetry, operational inefficiency, and relational tensions, which cut across the economic, managerial, and social dimensions of condominium life.

At the same time, the evolution of housing towards more service-oriented and user-centric models highlights how residential value increasingly depends on the coordinated delivery of services, transparent governance, and continuous interaction rather than on the dwelling alone.

Within this transition, digital technologies can play a pivotal enabling role: they provide the infrastructure to collect and share data, orchestrate multiple service providers, support real-time communication among stakeholders, and make decisions and responsibilities more traceable over time. From this perspective, PropTech solutions designed for the condominium context can be seen as concrete attempts to reorganize this fragmented ecosystem into a more integrated, transparent, and accountable system; and it is precisely this potential that the present chapter sets out to explore.

Building on this diagnosis, Chapter “5. *Digitalization as a driver of change in the condominium context*” has been built on a solution-oriented perspective, investigating how, in a concrete and operational way, digitalization and PropTech solutions can act as enabling levers to address this fragmentation. The central research question, guiding this work, frames digitalization not as the mere introduction of isolated applications, but as the gradual construction of a digital ecosystem: an ensemble of platforms, data infrastructures, channels, and coordination mechanisms through which residents, condominium managers, service providers, and other stakeholders interact over time. In this perspective, the condominium is interpreted as a socio-technical ecosystem, a configuration of interdependent actors, services, processes, and information flows organized around a shared physical infrastructure. Moreover, what is at stake is less the availability of specific tools and more the way in which digital technologies reconfigure relationships, interfaces, and operational backbones within this context.

The chapter “5. *Digitalization as a driver of change in the condominium context*” is structured into three main sections. Section “5.1 *Digitalization gap in the condominium context: Bridging fragmented ecosystem and stakeholder networks*” develops the analytical and conceptual foundation of the chapter. It opens with a problem framing that reorganizes the cross-cutting criticalities emerging from Chapter “4. *The Italian Condominium context: Physical Structure and Stakeholder Needs*” into six macro-dimensions of needs which constitute the analytical framework for the subsequent evaluation of digital solutions. It then positions PropTech as a potential ecosystemic infrastructure and translates the six dimensions into a set of evaluative criteria for assessing existing platforms. Section “5.2 *Case Studies Analysis: Mapping of PropTech solutions*” presents the ten PropTech solutions selected for comparative analysis through a desk-research procedure based on the Italian PropTech Network database, positioning them within the broader PropTech landscape and describing their primary

functional orientation. Finally, section “5.3 Critical comparison and emerging patterns” develops the comparative analysis across three complementary lenses: a qualitative and semi-quantitative assessment of functional coverage against the six criteria, an examination of the stakeholder groups and digital channels mobilized by each solution, and a synthetic interpretation of their overall ecosystem orientation.

5.1 Digitalization Gap in the Condominium Context

5.1.1 Problem Framing: Cross-Cutting Criticalities and Macro-Dimensions of Needs

Building on the analysis developed in Chapter “4. The Italian Condominium context: Physical Structure and Stakeholder Needs”, this section reorganizes the main criticalities affecting the condominium context and the actors involved into a more structured problem framing. Rather than examining these issues separately for each stakeholder group, the aim is to identify the recurring and cross-cutting problems that emerge at the intersection of actors, services, and information flows, and to synthesize them into a set of macro-categories of needs that will guide the subsequent analysis.

Based on the concept of condominium framework, the central issue is to understand how information, processes, and interactions circulate within this type of fragmented ecosystem. In fact, this fragmentation manifests itself across several interconnected dimensions, as highlighted in the previous chapters.

On the informational level, documents, minutes and financial data are often scattered across emails, private chats, paper archives and heterogeneous portals, generating information asymmetries and low traceability of decisions. On the communicative level, interactions between manager, residents and suppliers rely on unstructured channels (phone calls, informal messages, physical notice boards), resulting in redundant messages for some stakeholders and no information for others, variable response times and weak participation in collective decision-making. Operational management is equally affected by this “island-based” logic. Requests and incidents are typically handled on a case-by-case basis, without a shared system for opening, tracking and closing tickets, which makes it difficult to monitor the status of interventions, coordinate multiple suppliers and build cumulative learning over time. Similarly, the economic and accounting dimension often remains opaque: pressure on fees, arrears and misunderstandings around costs and budgets tend to reinforce mistrust towards management, in the absence of tools that make expenses, deadlines and financial responsibilities readable in real time. Moreover, the relational and community dimension is heavily influenced by this configuration. Recurrent conflicts, social isolation, socio-demographic heterogeneity and resident turnover weaken the sense of belonging, while dedicated channels for building trust, recognition and constructive conflict management are still limited. Finally, the shift towards a “service condominium” model further amplifies these tensions. The introduction of new shared spaces and services, such as common rooms, proximity services or community initiatives, requires clear usage rules, booking systems and mechanisms to allocate costs and responsibilities, which are rarely supported by adequate digital infrastructures. Without these tools, shared spaces remain under-used, the potential of additional services is reduced, and the resulting organizational complexity is largely absorbed by the condominium manager.

Taken together, these recurring issues show that the condominium is characterized by high interdependence but low infrastructural capacity to govern that interdependence in a coherent and integrated way. For this reason, the problem framing developed in this thesis does not simply list isolated inefficiencies, but clusters them into six macro-dimensions of needs that synthesize the main

transversal criticalities emerging from Chapter “4. *The Italian Condominium context: Physical Structure and Stakeholder Needs*” and provide the analytical framework for the next stages of the research. These dimensions are summarized as in the following table (*Table 6*).

Dimensions of main criticalities and needs
1. Informational transparency and data access
2. Communication channels
3. Operational management and coordination
4. Economic-accounting management and accountability
5. Space and service management
6. Relational and community dimension

Table 6: Table of the 6 criteria based on the main criticalities and needs. Source: Own Elaboration

5.1.2 The Enabling role of PropTech in the Condominium Context

Against the previous backdrop, the need for a digital infrastructure in condominium ecosystems becomes more evident. In this perspective and in line with what was said in the previous paragraph, PropTech should not be understood merely as a set of administrative software solutions supporting isolated management tasks, but rather as a potential ecosystemic infrastructure capable of connecting residents, condominium managers, and service providers through shared channels for information exchange, decision-making, service coordination, and operational monitoring. Such a shift is particularly relevant in the condominium context, where many of the inefficiencies, as highlighted in the previous section, do not stem from the absence of single functions, but from the lack of an integrated backbone and shared platform through which documents, requests, authorizations, communications, and services can be organized and coordinated over time.

Seen from this angle, the question is no longer whether digital tools should be introduced into condominium context, but how they can be used to reduce fragmentation, mitigate information asymmetries, and support more coherent interactions across a structurally interdependent yet weakly integrated environment.

First, a shared digital infrastructure responds to increasing demands for transparency, traceability, and accessibility of information by enabling residents and owners to access documents, decisions, financial data, and intervention histories in a clearer, timelier, and more verifiable way. This is especially important in a context where information is often dispersed across emails, paper archives, informal exchanges, and heterogeneous portals, making it difficult for stakeholders to reconstruct decision paths or obtain an updated picture of the condominium situation. In this sense, PropTech platforms may contribute to reducing one of the most persistent structural gaps of condominium governance, namely the asymmetry between those who control information and those who depend on fragmented and delayed access to it.

Second, digitalization can operate as a lever for standardizing operational processes and reducing dependence on informal routines, personal practices, and highly variable organizational habits that currently shape condominium management from one building or administrator to another. As shown in the previous chapter, requests for intervention, supplier coordination, authorizations, and follow-up activities are frequently managed through a mix of phone calls, emails, messaging apps, spreadsheets,

and ad hoc exchanges, producing discontinuities, delays, and limited traceability. PropTech solutions can help address these issues by introducing more structured workflows for incident reporting, ticketing, intervention planning, supplier coordination, and performance monitoring, thereby making operational processes more legible, and less dependent on individual improvisation. In this respect, digital tools do not simply accelerate existing practices, but may support a transition from reactive and episodic management towards a more organized and process-oriented model of condominium governance.

Third, a shared digital backbone can act as an enabler for more structured service-oriented condominium models, in which common spaces, additional amenities, and recurring services are coordinated through clearer rules, booking systems, and integrated allocation mechanisms. As the condominium gradually evolves beyond a purely minimal co-ownership arrangement and is increasingly exposed to expectations related to shared functions, new services, and higher-quality residential experiences, the capacity to organize access, scheduling, responsibilities, and related costs becomes more relevant. In this sense, PropTech may support not only the administrative management of the building, but also the operational feasibility of a more service-based condominium logic, where shared spaces and collective services are governed through transparent procedures and more explicit coordination devices.

Finally, digital infrastructures can also support the management of complex relationships between people by providing common communication channels, shared archives, workflow visibility, and accountability mechanisms that make interactions more understandable and manageable over time. This function is particularly significant in a setting where the administrator acts as the main coordination node and gatekeeper, while suppliers and residents often interact through incomplete information, delayed authorizations, and fragmented communication environments.

Starting from this perspective, and in order to bridge the organizational and infrastructural gaps identified in Section “5.1.1 Problem framing: cross-cutting criticalities and macro-dimensions of needs”, digitalization, which is interpreted as a coordination infrastructure, can be analyzed through the six transversal dimensions previously defined. Together, they try to translate the diagnosis of a fragmented condominium ecosystem into a functional assessment framework that makes it possible to evaluate whether, and to what extent, digital solutions contribute to reconnecting relationships, information flows, and operational processes. The following table (*Table 7*) synthesizes the 6 criteria providing a synthetic interpretation and the needs or criticalities addressed.

Criteria	Interpretation	Needs addressed
1. Informational transparency and data access	Ability of the solution to make condominium documents, information and decisions available in a clear, up-to-date and traceable way.	Information asymmetries in decision-making, difficulties in accessing documents and data on costs/interventions, demand for greater clarity and traceability.
2. Communication channels	Extent to which the solution offers and integrates tools to communicate in a structured way between residents, manager and suppliers.	Fragmented communication flows, delays or unclear messages about interventions, expenditures, and decisions.

Criteria	Interpretation	Needs addressed
3. Operational management and coordination	Support for everyday operational management: reporting, ticketing, supplier coordination, intervention planning and workflow monitoring.	Complexity in coordinating interventions and suppliers, delays, difficulty in tracking request status, complex logistics in multi-unit buildings, lack of shared operational standards.
4. Economic-accounting management and accountability	Functionalities to manage, communicate and make economic and accounting aspects understandable, ensuring responsibility and traceability of financial decisions and flows.	Pressure on expenses, arrears, misunderstandings around costs and budgets, need for stronger accountability and feedback mechanisms towards managers and suppliers.
5. Space and service management	Ability of the solution to support the use, booking and coordination of common spaces and condominium or proximity services.	Inefficient use of common spaces, difficulties in booking/organising them, growing demand for shared services and “service condominium” logics.
6. Relational and community dimension	Extent to which the solution facilitates the building of trust, collaboration and a sense of belonging among residents and towards the manager and service providers.	Conflict and isolation, socio-demographic heterogeneity, need to strengthen cohesion and a collaborative climate to reduce tensions and turnover.

Table 7: Criteria for analyzing digital solutions for the condominium ecosystem: macro-dimensions, brief definition, and needs/challenges addressed. Source: Own Elaboration

These six criteria constitute the analytical backbone through which the PropTech platforms and digital solutions examined in the following sections will be assessed. The next section applies this framework to a selection of PropTech solutions in order to understand whether, and to what extent, they are effectively able to address the infrastructural, organizational, and relational gaps that continue to characterize the condominium context.

5.2 Case Studies Analysis: Mapping of PropTech Solutions

Building on the methodological procedure described in Chapter “3. Research Framing and Methodology”, this section presents the set of PropTech solutions selected for the comparative analysis. As explained, the case studies were identified through a desk-research process starting from the Italian PropTechNetwork¹⁰ database, progressively narrowed down through cluster and sub-cluster filters, keyword searches in Italian, and a final qualitative assessment of relevance to condominium contexts. In addition, one additional solution was included through an external web search because of its explicit focus on the relationship between condominium administrators and suppliers.

¹⁰ The Italian PropTech Network, developed within the Real Estate Center of Politecnico di Milano, is a national hub that maps and aggregates startups, scaleups and other digital players contributing to a synergic exchange of knowledge and innovation in the Italian real estate sector.

The aim of this section is to provide an overview of the ten selected solutions and to position them within the broader PropTech landscape as a preliminary step to the criterion-based assessment developed in Section “5.1 Digitalization gap in the condominium context: Bridging fragmented ecosystem and stakeholder networks”. Rather than evaluating market performance or adoption levels, the analysis concentrates on the functional logics embedded in these platforms and on how they relate to the infrastructural, organizational, and relational gaps identified in the condominium ecosystem. From this perspective, the selected solutions are interpreted as potential digital infrastructures that can support different degrees of transparency, coordination, service integration, and community building in condominium life.

Table 8 presents the ten selected solutions and provides an overview of their positioning within the PropTech landscape. In addition to the original information on cluster and sub-cluster, the table retains the “Description” as it appears in the Italian database entries, in order to preserve the wording used in the keyword-based screening process. Within this column, the Italian search terms used in the methodological step – *condominio/i, residente/i, inquilino/i, amministratore/i, fornitore/i* – are highlighted in bold to make the link with the selection criteria explicit.

Furthermore, an additional column labelled “Primary focus” has been introduced to synthetically describe, in English, the main functional orientation of each solution as interpreted in relation to this research. While many platforms offer a wide range of features, this column captures the function that appears most central for the condominium ecosystem in relation to the objectives of this research, such as the centralization of communications, integrated condominium management, resident services, community building, maintenance coordination, or administrator–supplier matching. In the visual layout of the thesis, solutions that are strictly connected to condominium contexts (i.e. clearly addressing one or more condominium targets as primary users) are also highlighted with a specific background color, in order to distinguish them from those that are more general but still analytically relevant because, even if they operate on a broader residential or service scope, they address specific stakeholder groups, service logics, or operational functions that can be meaningfully transferred to the condominium ecosystem.

Solution	Cluster	Sub-cluster	Description	Primary Focus
Comunicasa (Casavi)	PROFESSIONAL SERVICES	PROPERTY & ASSET MANAGEMENT	Comunicasa è il brand Italiano di casavi GmbH, software company tedesca, che vuole digitalizzare i canali di comunicazione per la gestione di immobili. Infatti unisce in un'unica piattaforma 100% in cloud amministratori, condòmini, inquilini e fornitori di servizi semplificando i flussi di lavoro e migliorando la gestione interna del business. La piattaforma è facilmente accessibile tramite comuni devices.	Cloud platform to centralise communications, documents and issue reporting among administrators, condomini, tenants and suppliers. (Comunicasa, 2026)
Condeo	PROFESSIONAL SERVICES	PROPERTY & ASSET MANAGEMENT	Condeo è una piattaforma in cloud per agevolare la comunicazione tra proprietari/ inquilini e amministratore condominiale. Consente di aprire segnalazioni di guasti, ricevere notifiche e informazioni sullo svolgimento di manutenzioni ordinarie e straordinarie.	Digital condominium logbook that simplifies fault reporting and structured communication between administrator and residents. (Condeo, 2026)
Condowe	PROFESSIONAL SERVICES	PROPERTY & ASSET MANAGEMENT	Condowe propone un servizio dedicato alla gestione dei condomini , proponendo uno spazio virtuale in cui i gestori del condominio e i condomini possono scambiare informazioni e documenti. La piattaforma permette di creare anche uno spazio vendite in cui i condomini possono fare acquisti e l'amministratore ne guadagna una percentuale.	Virtual environment for condominium managers and residents that combines building management with a marketplace where residents can purchase services, generating extra revenue for the administrator. (Condowe, 2026)

Solution	Cluster	Sub-cluster	Description	Primary Focus
Resys	PROFESSIONAL SERVICES	PROPERTY & ASSET MANAGEMENT	ReSys, soluzione sviluppata da Softime, è una piattaforma di gestione e comunicazione tra gli inquilini , i manutentori, i gestori di un patrimonio immobiliare. Disegnando l'impianto iniziale della banda dati patrimoniale, la piattaforma è in grado di gestire le locazioni, le attività di manutenzione, le spese e i bandi. Inoltre, grazie alla tecnologia di Intelligenza Artificiale riesce a fornire report e grafici sull'andamento della gestione immobiliare.	Software for integrated real estate portfolio management, combining leases, maintenance, expenses and budgets with communication and advanced reporting modules. (ReSys, 2026)
Titiro Digital	PROFESSIONAL SERVICES	PROPERTY & ASSET MANAGEMENT	Titiro Digital realizza app per la gestione efficiente e virtuosa dell'appartamento e del condominio : permettono di controllare la domotica (tapparelle, luci, climatizzazione) e prenotare <i>amenities</i> presenti nell'edificio (spa, palestra piscina) e servizi esterni (lavaggio auto, lavanderia). Titiro App permette di prenotare e gestire le aree comuni, acquistare servizi e sbrigare commissioni, controllare la domotica, usufruire di un canale comunicazione dedicato alla residenza. Grazie a Titiro App è possibile accedere a servizi esclusivi costruiti sulle esigenze del condominio e avere un interlocutore per la risoluzione di ogni imprevisto sempre a disposizione.	App that turns the apartment and condominium into a "smart" environment, combining home automation, booking of common areas and external services, and resident communication. (Titiro Digital, 2026)
Kipò	PROFESSIONAL SERVICES	DATA INSIGHTS, LOCATION INTELLIGENCE & ADVISORY	Kipò, soluzione sviluppata da Softime, offre diverse soluzioni per la gestione integrale del condominio . Attraverso la collezione e analisi dei dati, i gestori dei condomini possono visualizzare, monitorare e gestire tutte le attività contabili, finanziarie e anagrafiche del condominio. Kipò Condominio offre una piattaforma gestionale in cloud per la gestione del condominio. Kipò Lavori offre una piattaforma di comunicazione per organizzare e monitorare le attività di manutenzione del condominio.	Cloud suite for comprehensive condominium management (data, accounting, maintenance and tax), based on data collection and monitoring for administrators. (Kipò, 2026)
Laserwall	SHARING ECONOMY	COMMUNITY LIFE	Laserwall è una bacheca digitale che si installa negli androni dei condomini . Mette a disposizione anche un portale gratuito online e un app mobile. LASERWALL Srl non è solo bacheca digitale: dispone infatti di un portfolio di prodotti ad essa connessi per garantire maggiore sicurezza degli spazi condominiali e tranquillità ai residenti.	Digital noticeboard and app that concentrate building communications, notices and services for residents, acting as an information and service hub for the condominium. (Laserwall, 2026)
Sugar	SHARING ECONOMY	COMMUNITY LIFE	Sugar ha sviluppato un portale online per i property manager integrato a un'app per gli inquilini con l'obiettivo di creare una community di residenti . Tramite l'app i residenti possono pagare l'affitto, accedere a spazi, condividere le chiavi, interagire con i vicini, accedere al marketplace di Sugar e a servizi, ricevere e condividere comunicazioni (informazioni, eventi), inviare feedback e contribuire al benessere della comunità. L'app può essere integrata da un sistema di controllo accessi.	Platform for property managers and tenants that integrates payments, access control, requests and community features for residents in a single app. (Sugar, 2026)
Livemote	SMART REAL ESTATE	INTEGRATED MANAGEMENT & OPERATIONS	Livemote è un insieme di soluzioni per assistere da remoto gli operatori e i fornitori sul campo impegnati in attività manutentive. Gestisce l'emissione dei work order, i workflow operativi, guidando gli operatori passo-passo in ogni intervento anche tramite sistemi di realtà aumentata.	Solution to manage on-site maintenance through digital work orders and remote support via augmented reality for service providers. (Livemote, 2026)
COSMIC AFFAIRS*	CONTECH	SUPPLIER MARKETPLACE	Cosmic Affairs è una piattaforma dedicata alla gestione condominiale che funge da punto d'incontro tra amministratori di condominio e fornitori qualificati. La piattaforma offre un database localizzato di aziende selezionate e permette agli amministratori di ricercare, confrontare e ingaggiare fornitori per lavori e servizi condominiali, gestendo richieste di preventivo e opportunità di lavoro in modo centralizzato e tracciabile.	B2B platform connecting condominium administrators and qualified suppliers, digitalising partner search, quote requests and company selection for works and services in the condominium. (Cosmic Affairs, 2026)

Table 8: PropTech solutions selected for comparative analysis: cluster affiliation, description, and main functions. Source: IPN Database

Taken together, these selected cases offer a heterogeneous yet analytically coherent set of solutions for exploring how PropTech currently addresses the management, coordination, communication, service, and relational needs emerging in condominium life. Their coherence does not derive from belonging to a single homogeneous market segment, but from their relevance to the condominium ecosystem as framed in this thesis. In this sense, the selected cases are not treated as equivalent in scope or positioning, but as complementary empirical references through which different dimensions of the condominium's digital transformation can be observed.

The following sections will therefore analyze these platforms through the six transversal criteria in order to understand their main areas of coverage, their limitations, and the extent to which they contribute to reducing the fragmentation that characterizes the condominium as a digital ecosystem. Building on this criterion-based assessment, the next sub-sections will further explore how these solutions differ in terms of stakeholder groups addressed, digital channels mobilized, and overall ecosystem orientation, thus providing a more articulated interpretation of their role within the condominium context.

5.3 Critical Comparison and Emerging Patterns

5.3.1 Qualitative Comparative Framework of the Selected Solutions

Building on the problem-framing developed in Chapter “4. *The Italian Condominium context: Physical Structure and Stakeholder Needs*” and on the methodological approach outlined in Section “3.3 *Methodological Approach*”, this section presents a critical comparison of a selected set of PropTech solutions operating in or transferable to the condominium context. As explained in the methodological chapter, in addition to assessing how each solution responds to the six analytical criteria derived from stakeholder needs, the analysis also considers the main stakeholder groups involved and the specific digital channels used (apps, web portals, dashboards, physical devices, etc.), to obtain a more granular picture of the socio-technical configuration of each platform and to inform the subsequent concept proposal.

The output of this comparative work is synthesized in three qualitative grids that constitute the backbone of the analysis presented in this chapter.

The first grid cross-tabulates each solution with six analytical criteria derived from the stakeholder needs and cross-cutting criticalities (*Table 9*). For each cell, short narrative descriptions specify how – and to what extent – the solution contributes to the corresponding criterion, distinguishing between robust coverage, partial or indirect support, and functional gaps. These descriptions are then translated into a semi-quantitative 0/1/2 rating in the following chapter, where the comparative assessment becomes more systematic and metric-based.

		CRITERIA OF ANALYSIS					
		1. Informational transparency and data access	2. Communication channels	3. Operational management and coordination	4. Economic-accounting management and accountability	5. Space and service management	6. Relational and community dimension
PROPTECH SOLUTIONS	Comunicasa (Casavi)	Centralised document area (condominium documents, minutes, notices) accessible via app/portal, with notifications about new content.	Structured messaging, online digital noticeboard, push/email notifications and bidirectional communication flows between managers and residents, including attachments and comments.	System for reporting/ticketing faults and requests, tracking status, assigning tasks to suppliers and storing the history of activities, which makes day-to-day management more coordinated.	Integration with existing accounting software and digital sharing of expense documents, instalments, allocation statements and reports, improving visibility and traceability for condominium owners.	It can support communications and requests related to services/spaces, but it is not centred on booking calendars.	It fosters a more continuous and transparent relationship between managers and residents (comments, messages, notices), but it is not designed as a neighbourhood social network.
	Condeo	Reserved area where condominium owners can consult communications, documents and information on interventions, with a history of activities.	Digital, structured channel between manager and residents, allowing the sending of notices, messages and notifications relating to condominium life.	Platform for opening fault reports, monitoring the status of interventions and coordinating the suppliers involved in ordinary and extraordinary maintenance.	Supports the digital sharing of financial documents related to interventions and condominium expenses, increasing traceability and clarity for residents.	The platform manages communications and interventions, but does not provide advanced modules for booking common areas.	It fosters a more direct and continuous relationship between manager and residents, but it is not conceived as a neighbourhood social network.
	Condowe	Shared virtual space in which managers and condominium owners can store and consult documents and information relevant to the condominium.	Digital environment for the exchange of communications between managers and residents, with the possibility of sending notices and updates.	Supports day-to-day management through the exchange of information and documents relating to interventions and suppliers, but is not centred on a structured ticketing system.	The “sales space” and purchase-tracking functions provide greater visibility over economic flows linked to services offered to residents.	Platform that enables an internal sales space within the condominium, facilitating the offer of goods and services to residents, but it does not allow booking of common areas.	It encourages interaction between manager and condominium community through the shared commercial dimension (sales space), but it is not designed as a neighbourhood social network.
	Resys	Centralised asset database and reporting tools that make information on properties, contracts, maintenance and expenses available for consultation.	Platform that structures communication between managers, tenants and maintenance providers through dedicated portals and activity notifications.	Maintenance module and request management system that coordinates the work of suppliers and technicians, tracking work orders and activity status.	Management of rents, expenses, tenders and reporting, with dashboards and reports that allow monitoring of the economic-financial performance of the portfolio.	Supports the management of services related to properties (maintenance, contracts, supplies), but is not focused on booking common areas.	It improves the “professional” relationship between manager, tenants and suppliers through clearer digital processes, but it does not work on the neighbourhood community dimension.
	Titiro Digital	App that centralises information on services, bookings, interventions and communications related to the residence.	Dedicated channel between residents and the manager/residence manager within the app, for communications and requests.	Digital management of service requests, bookings, interventions and unforeseen events, with coordinated workflows between residents and staff.	It can support payments and reporting related to services and amenities, but accounting functionality is not the core compared to the experiential side.	A central element is the booking and management of common areas (spa, gym, swimming pool) and external services (car wash, laundry).	It contributes to the quality of condominium life by offering “tailor-made” services and a single channel with the manager, while not being focused on sociality between neighbours.
	Kipò	Collection and analysis of accounting, personal and technical data of the condominium in a cloud platform that can be consulted by managers and, partly, by condominium owners.	Tools for sending communications and documents to condominium owners and suppliers, integrated into the management suite (mainly on the manager side).	“Kipò Lavori” module to organise and monitor maintenance activities, with digital exchange of information between manager and suppliers.	Focus on accounting and tax management (Kipò Condominio and Kipò Fisco), with automation, checks and production of tax documents and reports.	Indirect support, linked to the management of interventions and works on condominium spaces; it is not centred on the booking of amenities.	It mainly improves the “administrative” relationship through clear data and structured processes, and less the social/community dimension among residents.
	Laserwall	Digital noticeboard and app that make notices, regulations, documents and information about the condominium available in an always up-to-date way.	Structured channel for communications from the manager to residents and, partly, from residents, via screen in the entrance hall and app.	Supports fault reporting, information on interventions and access to supplier contacts, becoming a collection point for basic operational management.	It can convey information on expenses and deadlines, but it is not an accounting management system; the economic-accounting function is secondary.	It integrates neighbourhood- and building-level services (commercial offers, services) and can be connected to security and access-control solutions.	Central element, as the digital noticeboard and app foster a sense of community, spread information and support shared initiatives among residents.
	Sugar	App and portal that centralise information on rents, payments, access and communications relevant to rental life.	Messaging tools and push communications between property manager and tenants, including on community events and initiatives.	Management of maintenance requests, access, services and operational tasks related to the daily life of residential buildings.	Digital rent payments, tracking of charges and payment histories directly from the app.	Management of access to condominium spaces and services, plus a marketplace of services and offers for residents.	Strong emphasis on building community among residents, with social features, events and feedback tools.
	Livemote	Dashboards and intervention histories that allow managers and technicians to consult work orders, documentation and results of interventions, but do not provide information on condominium documents.	Digital channel (app + platform) for real-time communication between field technician and remote expert.	Core of the solution: creation, assignment and management of work orders, with step-by-step guidance for operators through AR and structured workflows.	It indirectly supports accounting through tracking of interventions and actuals, but it is not an economic management system.	Enables the delivery of maintenance services on building systems, but does not manage booking of condominium spaces.	Focused on the technician-manager relationship; it does not work on the resident community.
	Cosmic Affairs	Localised and continuously updated database of suppliers, with detailed information, contacts and quality certificates to facilitate supplier selection by managers, but it does not provide information directly useful to residents.	Web platform that supports dialogue between condominium managers and supplier companies, including through contact and quotation requests, but not directly with residents.	Supports the search for suppliers by geographic area and service category, reducing identification times and widening choice, but the focus is not on planning and monitoring maintenance.	Offers indirect support to economic efficiency through supplier comparison, reduced search times, exclusive promotions and agreements, but it is not accounting or condominium-reporting software.	The platform mainly focuses on the condominium services value chain and access to maintenance, consulting and specialists, rather than on the booking or direct management of common spaces.	Although it explicitly presents itself as a community and relational hub between managers and suppliers, with networking, webinars and events, it excludes the residents’ dimension.

Table 9: Qualitative matrix of the functional coverage of PropTech solutions with respect to the six identified analytical criteria. Source: Own elaboration based on official company websites, LinkedIn pages, and other publicly available materials.

The second (*Table 10*) and the third grid (*Table 11*) focus instead on the main stakeholder targets and digital channels mobilized by each solution, mapping whether residents, condominium managers, service providers and other stakeholders are directly addressed, and which technological touchpoints (mobile app, web portal, physical digital board, administrator dashboard, notification systems, ticketing tools, marketplaces, IoT integrations, APIs) are actually used. These two representations shift the perspective from “which needs are covered” to “who is reached and through which digital infrastructure”, highlighting the socio-technical architecture underpinning each solution.

		MAIN TARGET GROUPS INVOLVED			
		Residents (Tenants and Condominium Owners)	Condominium Managers / Property Managers	Service Providers / Maintenance Operators and Technicians	Other (non-resident owners; investment funds; public administration; etc.)
PROPTech SOLUTIONS	Comunicasa	☒	☒	☒	☐
	Condeo	☒	☒	☒	☐
	Condowe	☒	☒	☒	☐
	Resys	☒	☒	☒	☒
	Titiro Digital	☒	☒	☒	☐
	Kipò	☒	☒	☒	☒
	Laserwall	☒	☒	☒	☐
	Sugar	☒	☒	☒	☐
	Livemote	☐	☒	☒	☐
	Cosmic Affairs	☐	☒	☒	☐

Table 10: Key stakeholders affected by the PropTech solutions analyzed. Source: Own Elaboration based on official company websites, LinkedIn pages, and other publicly available materials.

		DIGITAL CHANNELS USED								
		Mobile app	Web portal (restricted browser area)	Physical digital noticeboard (screen in entrance hall/common areas)	Administrator panel / dashboard (management backend)	Notification channels (email, SMS, push notifications)	Ticketing system / online helpdesk	Marketplace / digital sales area (goods/services)	IoT / home automation integrations (sensors, actuators, smart access)	APIs / integrations with other management systems
PROPTech SOLUTIONS	Comunicasa	☒	☒	☐	☒	☒	☒	☐	☐	☒
	Condeo	☒	☒	☐	☒	☒	☒	☐	☐	☐
	Condowe	☐	☒	☐	☒	☒	☐	☒	☐	☐
	Resys	☐	☒	☐	☒	☒	☒	☐	☐	☒
	Titiro Digital	☒	☐	☐	☒	☒	☒	☒	☒	☐
	Kipò	☐	☒	☐	☒	☒	☒	☐	☐	☒
	Laserwall	☒	☒	☒	☒	☒	☒	☒	☒	☐
	Sugar	☒	☒	☐	☒	☒	☒	☒	☒	☐
	Livemote	☒	☒	☐	☒	☒	☒	☐	☐	☒
	Cosmic Affairs	☐	☒	☐	☒	☐	☐	☒	☐	☐

Table 11: Digital channels enabled by the PropTech solutions analyzed. Source: Own Elaboration based on official company websites, LinkedIn pages, and other publicly available materials.

Taken together, the three tables reveal a number of recurring patterns in the way PropTech solutions approach the condominium ecosystem. First, platforms such as Comunicasa, Condeo and, to some extent, Condowe and Laserwall place their core emphasis on communication, document sharing and basic ticketing, offering relatively strong support on transparency, messaging and everyday fault reporting, but less depth on economic-accounting functions or structured management of shared spaces.

Second, solutions like Kipò and Resys emerge as more strongly oriented towards data-driven and economic-accounting management, with sophisticated back-end dashboards, reporting tools and integration with accounting systems, while only partially addressing community-building or experiential dimensions for residents. Titiro Digital and Sugar, conversely, reinforce the “service and experience”

side of residential life, combining access control, booking of amenities and marketplace features with community-oriented functionalities, particularly in build-to-rent or serviced residential contexts.

A further pattern concerns the fragmentation of target coverage: while most solutions include administrators, residents and service providers among their users, Livemote and Cosmic Affairs are almost exclusively focused on B2B relationships, either between managers and field technicians or between managers and suppliers, thus reinforcing the operational and procurement layers of the ecosystem rather than direct resident engagement. From a channel perspective, almost all platforms rely on a combination of mobile app, web portal and administrator dashboard, whereas physical digital boards and advanced IoT integrations remain confined to a limited subset of cases (notably Laserwall and Titiro Digital), signalling a still partial exploitation of building-level smart infrastructure.

Overall, the grids suggest that no single solution fully covers all six analytical criteria in a robust way while simultaneously addressing all key stakeholder groups through a rich set of digital touchpoints. Rather, each platform embodies a specific service logic – communication-centric, accounting-centric, experience-centric or supplier-centric – which aligns with particular needs but also leaves visible gaps when compared with the systemic challenges identified for the condominium as a socio-technical ecosystem. These emerging patterns provide the interpretative bridge to the next chapter, where the semi-quantitative scoring of criteria allows for a more systematic comparison of coverage levels, stakeholder targets, and digital infrastructures across the selected solutions.

5.3.2 Functional Coverage Analysis across Analytical Criteria

To support the comparative assessment of the selected PropTech solutions, in this chapter, the results of the qualitative analysis developed in the previous section were translated into a semi-quantitative grid based on the six analytical criteria. The scoring system does not measure market performance, technological sophistication, or user satisfaction, but rather the extent to which each solution functionally addresses the key dimensions of the condominium ecosystem through a three-level scale: 0 when the need is not meaningfully addressed, 1 when it is only partially addressed, and 2 when the solution offers a more robust and integrated response. The following table (*Table 12*) provides a detailed breakdown of the three-level scale used to evaluate the functional coverage of the selected PropTech solutions.

Rating Scale		
0 Does not meet the need	1 Partially meets the need	2 Largely/robustly meets the need
The solution does not offer any meaningful tools for that criterion, or they are so marginal that they do not provide a significant response to the identified need.	It covers some aspects, but meets the need in an incomplete or partial way: basic, non integrated or shallow functions (e.g. only static documents without history/filters, only messaging without ticketing, etc.).	It offers a set of functionalities consistent with the definition of the criterion under examination, integrated into the user journey and sufficient to address, to a large extent, the critical issues identified.

Table 12: Description of the rating scale (0–2) used to measure the level of functional coverage of the solutions. Source: Own Elaboration

To ensure the transparency of the analysis while allowing for an immediate visual assessment of the strengths, weaknesses, and recurring trends among the selected cases, a color-coded comparison matrix was used (*Table 13*). This table highlights both the individual score assigned to each solution for each criterion and the overall picture of functional coverage within the sample.

Beyond making the scoring procedure transparent, the matrix also confirms and refines the qualitative patterns discussed in the previous section. Communication-centric platforms such as Comunicasa and Condeo display high scores on informational transparency, communication channels and day-to-day operational coordination, while remaining weaker on space, service and community-building criteria. Accounting-oriented solutions like Kipò and Resys reinforce their profile as back-office infrastructures, concentrating their strongest scores on economic-accounting management and data-driven control, but only partially extending into experiential or relational dimensions. By contrast, more experience- and service-oriented cases such as Titiro Digital, Laserwall and Sugar present a more articulated coverage of space and service management and relational/community criteria, in line with their positioning as residential service hubs rather than purely administrative tools.

		CRITERIA OF ANALYSIS					
		1. Informational transparency and data access	2. Communication channels	3. Operational management and coordination	4. Economic-accounting management and accountability	5. Space and service management	6. Relational and community dimension
PROPTech SOLUTIONS	Comunicasa	2	2	2	1	0	0
	Condeo	2	2	2	1	0	0
	Condowe	2	2	1	1	1	0
	Resys	2	2	2	2	0	0
	Titiro Digital	2	2	2	1	2	0
	Kipò	2	1	2	2	0	0
	Laserwall	2	2	1	1	2	2
	Sugar	2	2	2	2	2	2
	Livemote	1	2	2	1	1	0
	Cosmic Affairs	1	1	1	0	1	1

Table 13: Comparative matrix of scores assigned to PropTech solutions for each of the six analytical criteria (scale 0–2).
Source: Own Elaboration

Looking at the average coverage by criterion (*Figure 59*), the strongest dimensions across the sample are “informational transparency and data access” and “communication channels”, both reaching an average score of 1.8, followed closely by “operational management and coordination” with 1.7. These results suggest that the current offer of condominium-oriented digital solutions is especially effective in addressing recurrent problems related to fragmented communication, low visibility of information, and the need to structure operational interactions among residents, managers, and service providers.

By contrast, the lower scores recorded for “economic-accounting management and accountability”, which reaches an average of 1.2, and especially for “space and service management” and “relational and community dimension”, with average values of 0.9 and 0.5 respectively, indicate that these areas are less systematically addressed across the market. This pattern is coherent with the broader interpretation developed in the thesis, according to which most currently available solutions tend to focus on administrative communication, request handling, and information exchange, while more advanced forms of service orchestration, amenity management, and community-building remain less widespread or more unevenly developed.

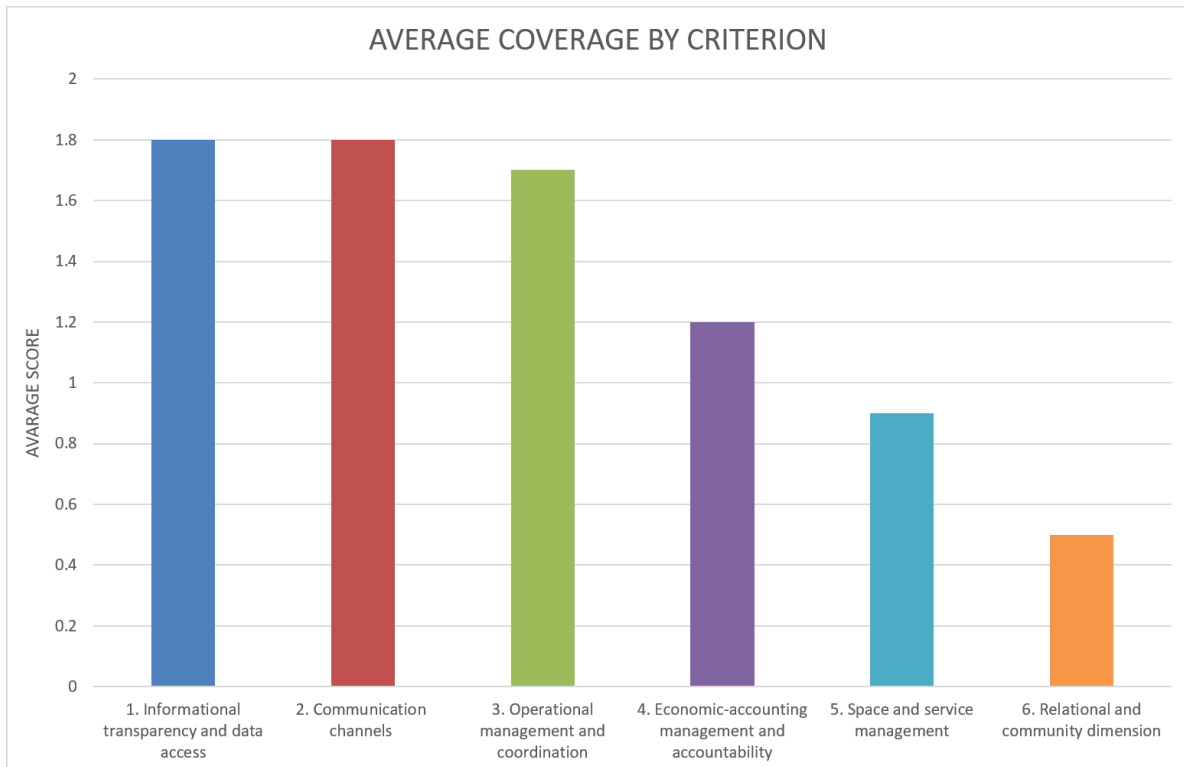


Figure 60: Average functional coverage values for each analytical criterion in the selected PropTech solutions. Source: Own Elaboration

A more nuanced interpretation emerges from the percentage distribution of coverage levels by criterion (Figure 60). “Informational transparency” and “communication channels” show the highest concentration of robust scores, with 80% of the solutions scoring 2 in both dimensions, while “operational management and coordination” follows with 70% of cases scoring 2. This confirms that these three criteria represent the most mature and consolidated functional areas within the selected sample.

“Economic-accounting management and accountability” presents a more mixed profile, with 60% of solutions scoring 1, 30% scoring 2, and 10% scoring 0. This suggests that accounting-related functions are often present, but frequently in a partial or secondary form, rather than as a fully integrated core component of the platform. An even more fragmented pattern emerges for “space and service management”, where 40% of the solutions do not meaningfully address the criterion, while only 30% provide a robust response.

The “relational and community dimension” is the weakest area in the sample, with 70% of the solutions scoring 0, 10% scoring 1, and only 20% reaching a score of 2. This result is particularly significant because it highlights a structural gap between the growing relevance of relational quality, trust, and community dynamics in contemporary residential environments and the still limited attention paid to these aspects by many PropTech solutions currently operating in the condominium field.

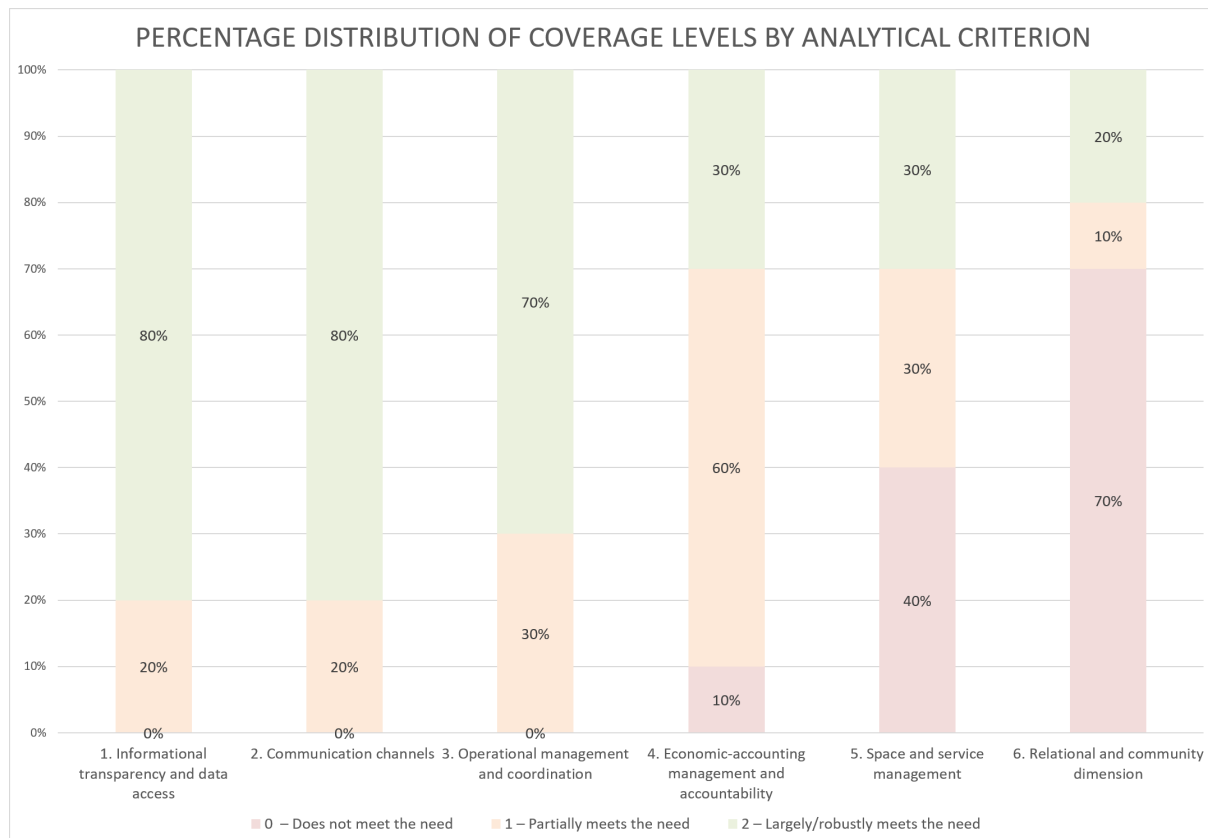


Figure 61: Percentage distribution of coverage levels (0, 1, 2) for each analytical criterion in the solutions analyzed. Source: Own Elaboration

When the analysis shifts from criteria to individual solutions, the overall functional profiles become more evident (Figure 62). Sugar emerges as the most comprehensive case, reaching the maximum total score of 12 and covering all six criteria with robust values, which makes it the only solution in the sample able to combine communication, operational management, accounting, space and service functions, and community-oriented features in a consistently integrated way. Laserwall also shows a broad and relatively balanced profile, with a total score of 10, standing out particularly for its contribution to community dimension and service-related functions alongside more traditional communication features.

A second group of solutions displays a medium-high level of functional coverage but with a more selective focus. Titiro Digital reaches a total score of 9 and stands out for its strength in space and service management, while ReSys reaches 8 by combining strong performance in transparency, communication, operational coordination, and accounting-management dimensions. Other solutions such as Comunicasa, Condeo, Condowe, Kipò, and Livemote cluster around a total score of 7, yet they do so through different configurations, confirming that similar aggregate values may correspond to distinct functional specializations.

This point is important from an interpretative perspective. Comunicasa and Condeo are particularly strong in transparency, communication, and ticket-based operational coordination, but much weaker in community and service-space functions; Kipò is more solid on the accounting side; Livemote is highly focused on maintenance workflows and technical coordination; Condowe introduces a more commercial and service-related layer, although still with limited depth in the relational dimension. Cosmic Affairs, with a total score of 5, appears as the most specialized and narrow-profile case, mainly oriented toward supplier search and professional interaction rather than toward a broader condominium ecosystem logic.

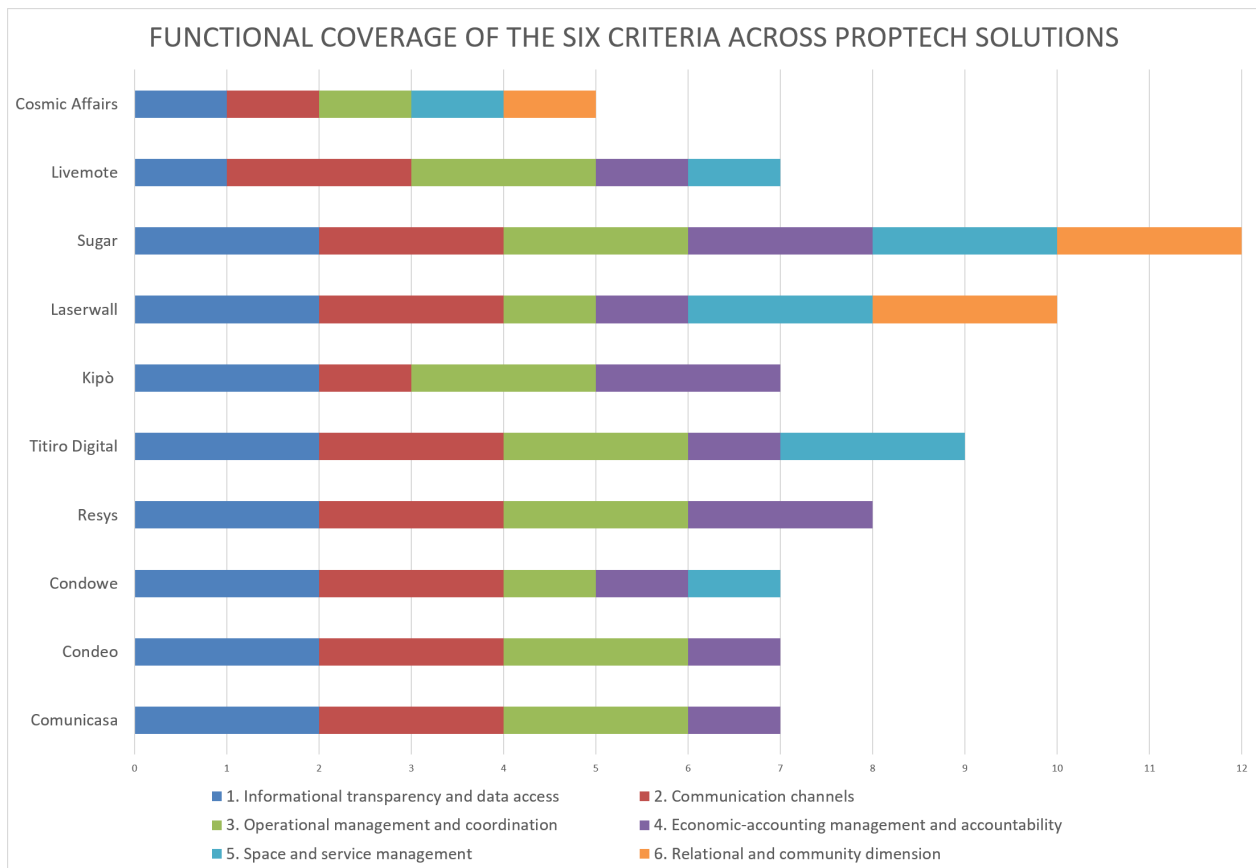


Figure 62: Total functional coverage score for each of the PropTech solutions analyzed (sum of the six criteria). Source: Own Elaboration

Overall, the functional mapping highlights that the current PropTech landscape already provides relatively mature responses to some of the most recurrent condominium inefficiencies. At the same time, the analysis also reveals that more integrated responses remain limited in areas linked to shared service management, experiential functions, and the relational dimension of condominium life, which still appears underdeveloped in much of the current market offer. In this sense, the comparative assessment does not only identify the most complete solutions, but also makes visible the structural gaps that can inform the final design-oriented reflection developed.

5.3.3 Target Stakeholders and Digital Infrastructures Analysis

In addition to the functional analysis developed in the previous sections, it is useful to examine the selected case studies through two further dimensions: the stakeholder groups addressed by the solutions and the digital infrastructures through which their services are delivered and coordinated. This perspective makes it possible to understand not only which needs are covered, but also which actors of the condominium micro-ecosystem are effectively included and through which interfaces, channels, and digital coordination architectures this inclusion takes place.

The first relevant finding concerns the distribution of the main stakeholder groups involved. As shown in Figure 62, condominium managers and service providers each account for 33% of total occurrences, while residents/tenants/condominium owners account for 27% and the residual “other” category remains marginal at 7%. This result suggests that the analyzed market tends to be structured primarily around the operational and managerial nodes of the residential service chain, namely the actors responsible for coordinating processes and those directly involved in service execution, rather than around indirect or institutional actors.

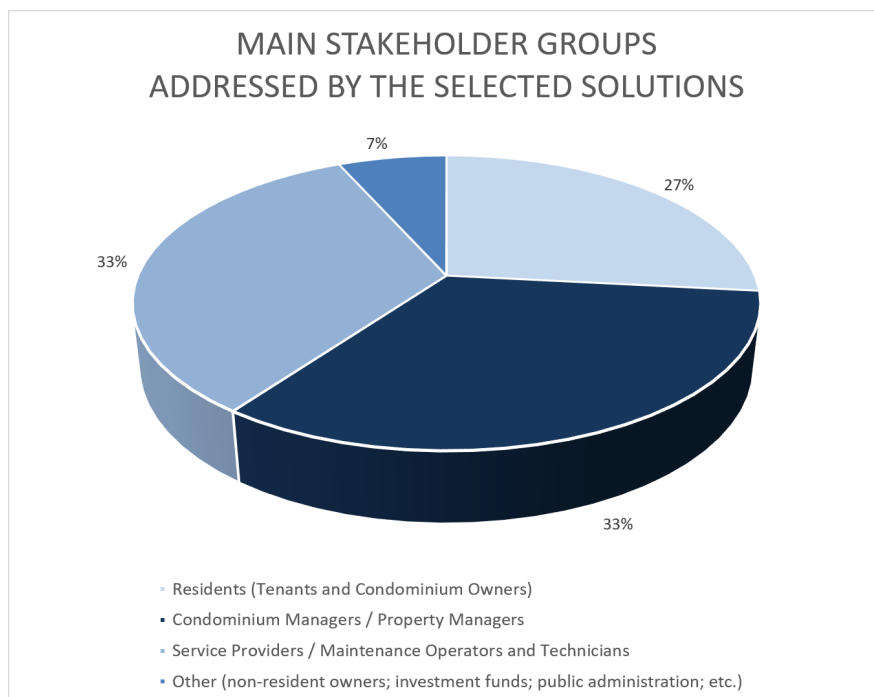


Figure 63: Main stakeholder groups reached by PropTech solutions (percentage of occurrences by category). Source: Own Elaboration

From this perspective, the case studies confirm what emerged in the previous chapters regarding the condominium as a multi-actor ecosystem strongly dependent on the orchestration capacity of managers and service providers. The fact that almost all the solutions include condominium managers and maintenance operators among their core target groups indicate that digitalization in this field is still interpreted largely as a lever to improve coordination, operational traceability, request management, and information exchange among professional actors, rather than as a tool focused exclusively on the end-user residential experience.

The chart (*Figure 63*) allows a closer reading of the infrastructural dimension of this logic. The most widespread channels are the administrator panel/dashboard, present in 10 out of 10 solutions, the web portal and notification channels, each present in 9 out of 10 cases, followed by ticketing/online helpdesk in 8 cases and mobile apps in 6 cases. This configuration is particularly significant because it shows that the dominant digital infrastructure is not built only as a user-facing front-end, but above all as a managerial back-end, a structured communication system, and a device for governing operational workflows.

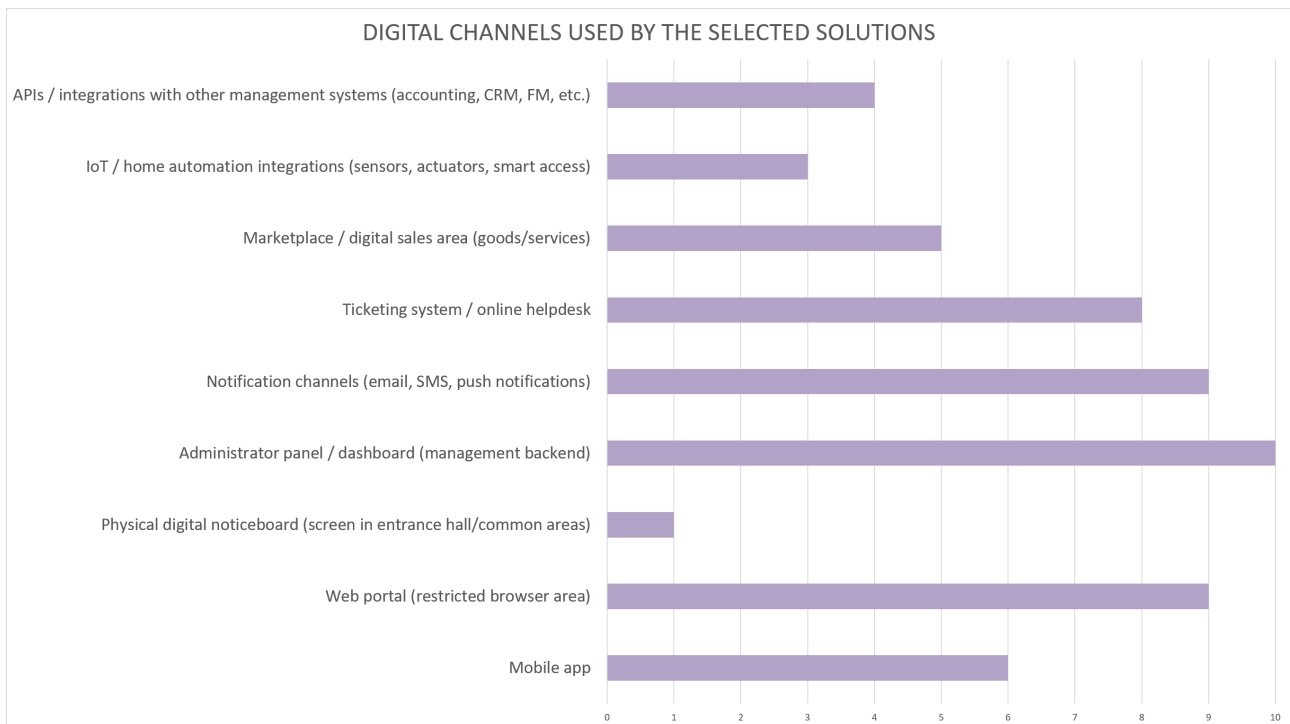


Figure 64: Digital channels most frequently used by the selected PropTech solutions (number of solutions by channel type).
Source: Own Elaboration

In other words, the prevailing digital architecture of the analysed solutions appears to be composed of three recurrent layers. The first is an internal governance layer, represented by the administrator dashboard, which centralizes data, documents, requests, and workflows. The second is an interaction layer, based on web portals, mobile apps, and notification systems that connect the various actors involved. The third is an operational coordination layer, in which ticketing plays a crucial role by transforming informal requests into traceable, assignable, and monitorable tasks.

By contrast, more advanced or specialized infrastructures appear less widespread. Marketplace functionalities are present in 5 out of 10 solutions, API integrations with other systems in 4 cases, IoT/home automation integrations in 3, while the physical digital noticeboard appears in only one case, namely Laserwall. This suggests that, within the selected sample, the level of digital maturity remains mainly centered on the digitalization of basic informational, relational, and coordination processes, whereas systemic interoperability and smart-building-oriented functions are still less consolidated.

Moreover, the chart (Figure 64) adds a useful comparative layer by showing the different degree of breadth characterizing the platforms under analysis. Laserwall is the solution with the highest number of digital channels covered, equal to 8, while addressing 3 main stakeholder groups; Sugar follows with 7 channels and 3 targets; Comunicasa and Titiro Digital reach 6 channels with 3 targets, whereas Resys and Kipò combine a broader target coverage, with 4 stakeholder groups, and 5 channels each. At the opposite end, Cosmic Affairs appears as the most focused solution, covering 2 target groups and 3 digital channels, while Livemote also targets 2 groups but covers 6 channels, confirming a relatively high infrastructural specialization despite a narrower stakeholder perimeter.

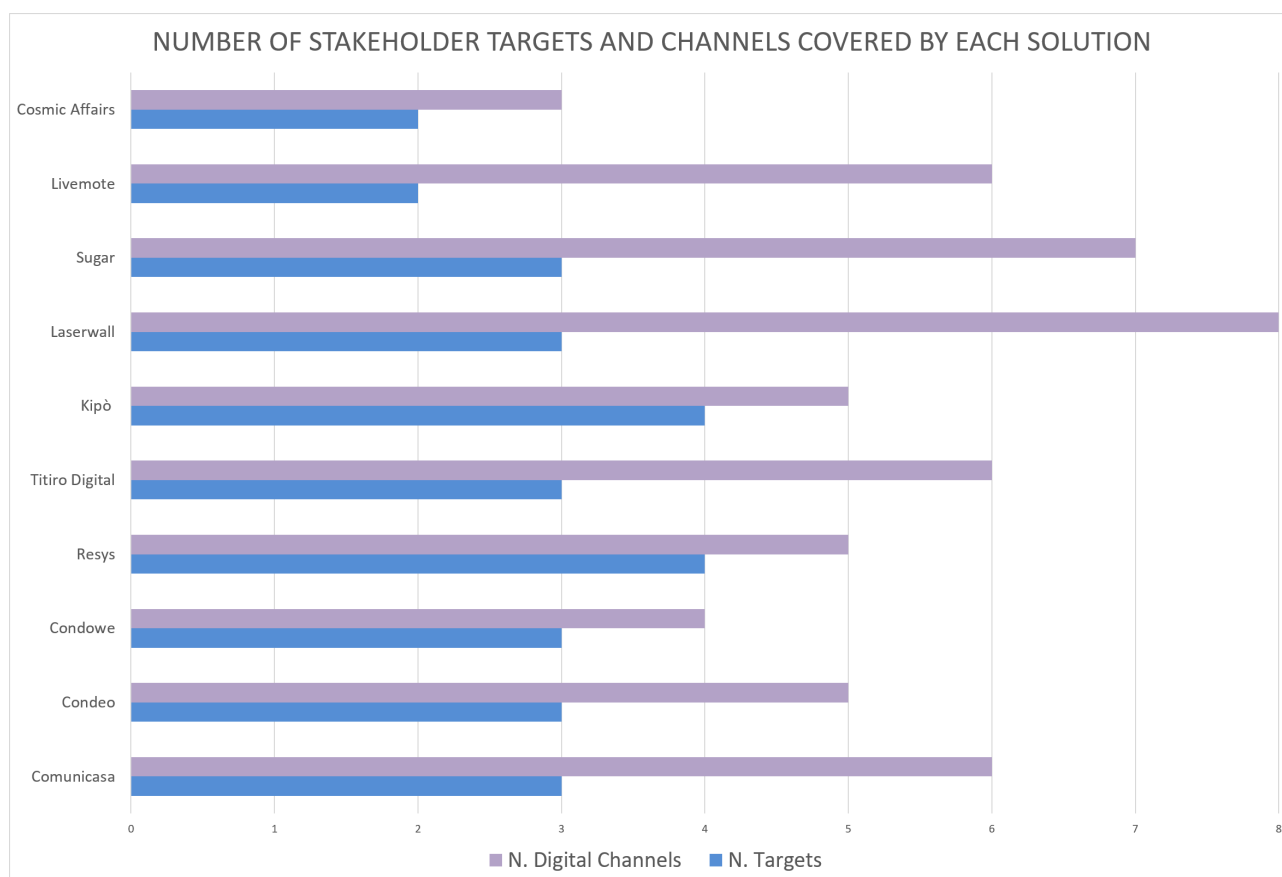


Figure 65: Number of target stakeholders and digital channels covered by each PropTech solution analyzed. Source: Own Elaboration

This differentiation is important because it shows that not all the solutions pursue the same idea of a digital ecosystem. Some platforms adopt a broader logic and attempt to cover a higher number of interfaces and actors, thus moving closer to the idea of an integrated condominium hub; others instead focus on a more circumscribed portion of the value chain, such as the manager-supplier relationship or the operational management of maintenance activities. In this sense, the variety of case studies does not simply reflect different sets of functionalities, but also different positioning strategies with respect to the broader problem of fragmentation in condominium contexts.

Taken together, the three charts outline a coherent picture. The selected solutions tend to address primarily the professionalized actors of the condominium system, rely mostly on digital infrastructures oriented towards managerial coordination and traceable communication, and differ in terms of the breadth with which they combine stakeholder targets and digital channels. As a result, PropTech innovation in the analyzed context does not appear merely as the addition of digital services to the condominium environment, but rather as an attempt to build organizational interfaces capable of making the relationships among stakeholders more legible, integrated, and governable.

From an interpretative perspective, this finding reinforces the idea that condominium digitalization acts first and foremost as a relational and operational infrastructure, instead of a “smart” technology in a narrowly technical sense. The value of the selected platforms seems to lie mainly in their ability to structure communication flows, standardize requests, increase process visibility, and create shared access points to information, thereby addressing some of the most recurrent criticalities identified in the condominium context.

At the same time, the analysis also suggests that the breadth of actors involved and the plurality of channels activated do not automatically correspond to the same degree of functional integration. Rather, they reveal different infrastructural configurations through which the selected solutions position themselves within the condominium ecosystem. These comments provide the basis for the next section, which brings these dimensions together into a more synthetic interpretation of ecosystem orientation.

5.3.4 Ecosystem Orientation of the Selected PropTech Solutions

In line with the central research question of this thesis, this subsection aims to move beyond the assessment of isolated functionalities and to examine the broader ecosystem orientation of the selected PropTech solutions. While the previous chapters focused on the extent to which each solution covers the six analytical criteria derived from stakeholder needs and recurring condominium criticalities, the present analysis seeks to understand to what extent these solutions are configured as more ecosystem-oriented devices, namely as tools capable of addressing a wider plurality of functions, stakeholders, and interaction channels within the condominium context. In this sense, the purpose is not to identify the “best” solution in absolute terms, but rather to distinguish between platforms that remain focused on specific operational or managerial tasks and those that show a stronger capacity to support a broader and more integrated service ecosystem logic.

To build this interpretative dimension, the ecosystem orientation of each solution was constructed by combining three analytical components. In the first component, a weighted functional coverage score was calculated by applying specific weights to the six analytical criteria used throughout the comparative assessment: criteria more directly linked to the condominium ecosystem perspective were assigned a full unit weight, while those less tightly connected to this ecosystem logic were assigned a half-point weight, so as to reflect their more indirect but still relevant contribution to the overall orientation. The second considers the variety of stakeholder groups involved, namely the extent to which the solution addresses residents, tenants and condominium owners, condominium managers or property managers, service providers and maintenance operators, and, where relevant, other actors. The third concerns the plurality of digital channels activated by each solution, including mobile app, web portal, digital noticeboard, dashboard, notification systems, ticketing, marketplace functions, IoT integrations, and APIs or links with other management systems. Taken together, these three dimensions make it possible to interpret ecosystem orientation not simply as functional richness, but as the degree to which a solution is able to operate across multiple condominium actors, organizational interfaces, and service touchpoints.

On this basis, the selected solutions were grouped into three levels of ecosystem orientation: high, medium, and low. The classification was not intended as a market ranking, but as a synthetic interpretative device aimed at highlighting different solution logics in relation to the condominium ecosystem framework developed in the thesis.

More specifically, solutions classified as high are those that combine broad functional coverage, the involvement of several stakeholder groups, and a relatively rich set of digital channels; medium-level solutions show a relevant but more selective or uneven configuration; low-level solutions, instead, tend to remain more specialized, addressing a narrower segment of needs, actors, or interfaces. The detailed thresholds are explained in the following table (*Table 14*).

		INTERPRETATIVE THRESHOLD
ECOSYSTEM ORIENTATION LEVEL	HIGH	Broad weighted functional coverage, at least 3 stakeholder groups involved, and at least 5 digital channels activated.
	MEDIUM	Intermediate weighted functional coverage, at least 2 stakeholder groups involved, and at least 3 digital channels activated.
	LOW	More limited weighted functional coverage, 1 stakeholder group prevalently involved, and fewer than 3 digital channels activated.

Table 14: Interpretative threshold for the ecosystem orientation levels of the PopTech solutions Source: Own Elaboration

The bubble chart (Figure 65) makes this pattern particularly visible by positioning each solution according to its ecosystem score on the horizontal axis and its total functional score on the vertical axis, while using bubble size to represent the number of digital channels activated by the platform. This visual output clearly shows that the solutions classified as high are concentrated in the upper-right area of the graph, where broader ecosystem orientation corresponds to stronger functional coverage and, in most cases, a wider digital interface structure. Conversely, the lower-left side of the graph is occupied by more specialized solutions, which combine lower ecosystem scores with narrower functional profiles and fewer digital channels. It is important to notice that the number of stakeholder groups addressed was not included as a separate graphical dimension, since the previous analysis did not reveal a clear pattern between the breadth of targets, the number of channels and the overall functional scores, and its discriminating power therefore appeared more limited in comparison.

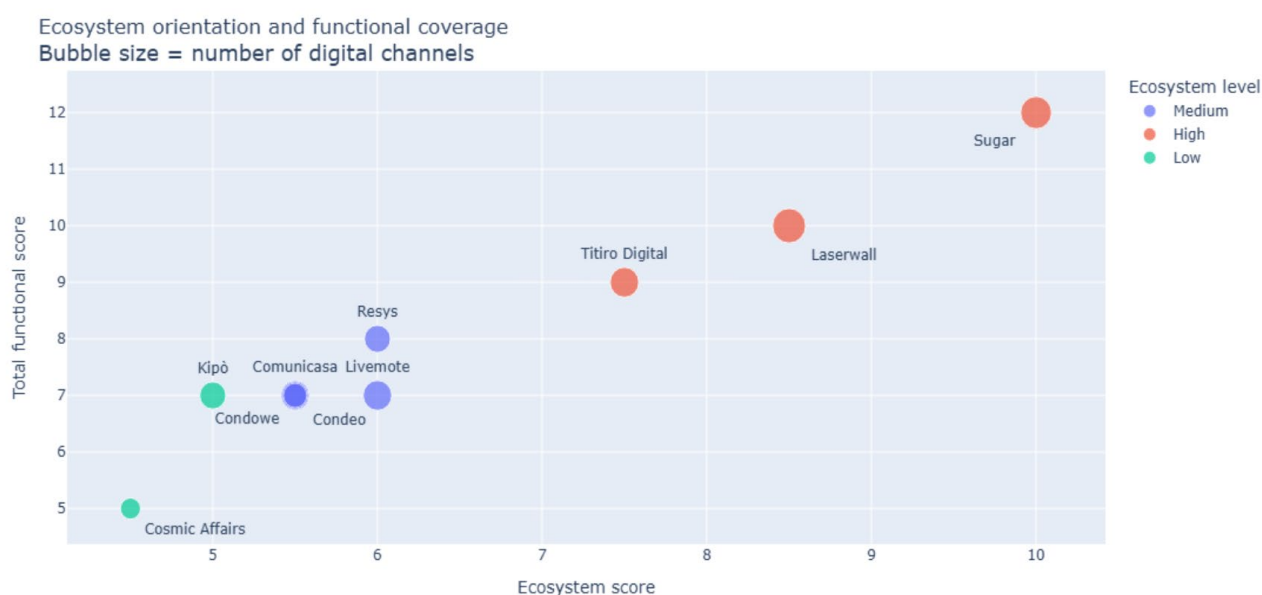


Figure 66: Ecosystem-oriented PropTech solutions: the relationship between total functional score, ecosystem score, and the number of digital channels activated. Source: Own Elaboration

The synthetic classification table confirms this reading (Table 15). Sugar, Laserwall, and Titiro Digital emerge as the only solutions with a high ecosystem orientation, while Comunicasa, Condeo, Condowe, ReSys, and Livemote fall into the medium category, and Kipò and Cosmic Affairs are classified as low. Considered together, the graph and the table support an interpretation of the selected PropTech

landscape as internally differentiated: some solutions already reflect a more integrated, multi-actor, and service-oriented logic, whereas others remain primarily focused on specific tasks such as accounting, maintenance coordination, or supplier matching.

		CONDOMINIUM ECOSYSTEM ORIENTATION
		Ecosystem Level
PROPTech SOLUTIONS	Comunicasa	MEDIUM
	Condeo	MEDIUM
	Condowe	MEDIUM
	Resys	MEDIUM
	Titiro Digital	HIGH
	Kipò	LOW
	Laserwall	HIGH
	Sugar	HIGH
	Livemote	MEDIUM
	Cosmic Affairs	LOW

Table 15: Level of ecosystem orientation assigned to the selected PropTech solutions. Source: Own Elaboration

The first group includes solutions with a high ecosystem orientation, namely Sugar, Laserwall, and Titiro Digital. What distinguishes these cases is not only their relatively high functional scores, but also their capacity to combine several layers of interaction within the residential environment. Sugar represents the most comprehensive example, reaching the highest overall functional score and combining communication, payment management, service access, marketplace functions, and community-oriented features within a single platform. Laserwall also displays a strong ecosystem logic, not because it covers every managerial function in depth, but because it connects communication, building-level information, access-related services, and shared initiatives through both digital and physical interfaces such as the noticeboard. Titiro Digital, in turn, stands out for its orientation toward service orchestration and residential experience, especially through the management of common spaces, amenities, and app-based interactions with residents. Taken together, these solutions appear closer to a service-oriented and experience-based housing logic, where value is created not only through administrative efficiency, but also through the integration of services, interfaces, and user touchpoints across everyday residential life.

A second and more numerous group is composed of medium-orientation solutions: Comunicasa, Condeo, Condowe, ReSys, and Livemote. These platforms show a relevant contribution to condominium digitalization, but they do so through a more focused logic, typically anchored in a limited set of ecosystem dimensions. Comunicasa and Condeo are strong examples of platforms oriented toward communication, document sharing, and request management, thus improving transparency and day-to-day coordination, yet without extending significantly into community-building or service ecosystem diversification. ReSys offers a broader managerial architecture and reaches a relatively high functional score, especially because of its strength in reporting, maintenance, and economic monitoring, but it remains more professional-managerial than resident-ecosystem-oriented. Condowe

introduces some service and marketplace elements, while Livemote is particularly strong in technical workflow coordination; however, both remain positioned in more selective parts of the condominium ecosystem. Overall, these medium-level cases show that many current PropTech solutions do contribute to improving condominium governance, but often through targeted enhancements rather than through a fully integrated ecosystem logic.

The final group includes low-orientation solutions, namely Kipò and Cosmic Affairs. This classification does not imply that these solutions are weak in absolute terms, but rather that they are more specialized and less ecosystem-wide in the way they structure value creation. Kipò shows solid capabilities in accounting, fiscal management, and administrative control, and therefore responds effectively to a crucial area of condominium governance, yet it remains less open to broader resident engagement, shared service management, or community-related functions. Cosmic Affairs is even more specialized, as it mainly operates as a supplier marketplace connecting condominium managers with qualified providers, which makes it relevant for procurement and professional networking, but much less comprehensive in relation to the broader ecosystem of residents, shared services, and multi-channel interaction. These cases confirm that digital innovation in the condominium field can take place through highly focused tools that solve specific coordination problems without necessarily evolving into integrated ecosystem platforms.

Overall, the ecosystem orientation analysis enriches the previous functional comparison by introducing a more systemic perspective on the selected PropTech solutions. It shows that the most ecosystem-oriented cases are not simply those with more functions, but those that more effectively combine functional breadth, stakeholder inclusion, and interface plurality within a coherent residential service logic. At the same time, the results suggest that the current market remains largely polarized between a limited number of more integrated and experience-oriented platforms and a broader set of solutions that still operate through specialized, managerial, or single-interface logics. From the perspective of the thesis, this distinction is particularly relevant because it helps clarify under which conditions digital tools may act not only as operational supports, but as enabling infrastructures for a more integrated and stakeholder-responsive condominium ecosystem.

5.3.5 Emerging Gaps and Innovation Opportunities

The comparative analysis highlights that current PropTech solutions only partially address the broader infrastructural needs of the condominium ecosystem. While several platforms provide robust support for communication, information access, and day-to-day operational coordination, the overall landscape remains uneven in the way it covers the six analytical criteria, involves different stakeholder groups, and connects multiple digital touchpoints. This suggests that the digital transformation currently observable in the field remains significant but still incomplete from an ecosystem perspective.

A first recurring gap concerns the limited integration between administrative efficiency and the experiential dimension of condominium life. Many of the solutions analyzed perform relatively well in document sharing, messaging, ticketing, and maintenance coordination, but remain much weaker in supporting the use of shared spaces, the coordination of proximity services, and the social or community dimension of residential life. As a result, these solutions often improve the management of the condominium without fully transforming it into a more service-oriented and relational ecosystem.

This functional imbalance is closely associated with an uneven distribution of benefits, visibility, and agency across stakeholder groups. Most platforms are primarily structured around the needs of condominium managers, property managers, and service providers, while residents tend to be included mainly as recipients of information, request senders, or users of predefined services. Although this configuration may improve operational efficiency, it only partially addresses the need for more balanced

participation, greater visibility over decision-making, and more active forms of resident engagement that had emerged in the problem framing. For this reason, many of these PropTech solutions still play a limited role in facilitating meaningful connections among stakeholders and seldom support the psychosocial and relational dimensions that are increasingly important in contemporary housing environments.

A further weakness concerns the infrastructural logic underlying many of the analyzed solutions. Whether in the form of a website, a mobile app, or a digital noticeboard, many cases still reproduce relatively simple and conventional forms of digitalization, often translating existing practices into digital form without substantially rethinking the underlying service logic or the social processes they are meant to support. In this sense, the mere adoption of ICTs or recent digital tools cannot, in itself, be considered a genuine form of innovation, since innovation emerges only when technology is used to develop new ways of addressing socially relevant problems and improving people's quality of life.

This infrastructural weakness also emerges in the limited interoperability of many of the analyzed solutions and in their poor integration with existing management systems and digital infrastructures. In many cases, platforms operate as relatively isolated tools rather than as components of a shared digital backbone capable of connecting accounting software, maintenance workflows, supplier coordination systems, resident interfaces, and other existing managerial environments. As a consequence, digitalization risks reproducing fragmentation in digital form, generating parallel platforms, duplicated information, and disconnected processes instead of building a more coherent and traceable condominium ecosystem.

Taken together, these weaknesses help explain why broader ecosystem orientation remains relatively rare across the current PropTech landscape. Only a limited number of cases combine wide functional coverage, multiple stakeholder groups, and a rich set of digital channels, while many other solutions remain more specialized or vertically focused on accounting, maintenance, communication, or supplier matching. In this sense, the current market appears internally differentiated: some platforms move towards a more integrated service logic, whereas others still reproduce the fragmentation of the condominium ecosystem through partial and actor-specific digital tools.

These unresolved gaps, however, also reveal important innovation opportunities. First, there is space for solutions capable of integrating administrative, operational, experiential, and relational functions within a shared and interoperable digital backbone, rather than treating them as separate application domains. Second, the weak coverage of community-building and resident-centred functions suggests the potential value of platforms that support not only service access and communication, but also trust-building, feedback loops, and more continuous forms of interaction among residents, managers, and providers.

More broadly, the findings indicate that future innovation in the condominium field should not focus only on adding new isolated functionalities, but on designing ecosystem-oriented infrastructures able to connect actors, services, spaces, and information flows more coherently. From this perspective, the most relevant opportunity does not lie in the optimization of single tasks alone, but in the development of a digital condominium environment that can operate as a shared coordination infrastructure for the multiple interdependencies that characterize condominium life. This provides the basis for the next chapter, which outlines a conceptual proposal for a more integrated digital condominium ecosystem.

6. Discussion and Concept Proposal for an Integrated Digital Condominium Ecosystem

The previous chapters have progressively built the analytical basis that makes it possible to move from diagnosis to proposal. Starting from the broader transformation of housing and from the reframing of the condominium as a fragmented micro-ecosystem, the thesis has shown that residential value in condominium contexts increasingly depends not only on the physical asset, but also on the quality of coordination, transparency, service integration, and stakeholder interaction. Chapter “4. *The Italian Condominium context: Physical Structure and Stakeholder Needs*” deepened this perspective by examining the condominium context and its main actors, highlighting how they operate in a highly interdependent environment marked by several challenges and complex dynamics.

Chapter “5. *Digitalization as a driver of change in the condominium context*”, where these heterogeneous issues have been translated into a structured problem framing, showed that the current market already offers several useful tools and partial responses, especially in relation to communication, document access, and operational support, but that broader ecosystem integration remains limited. In particular, recurrent gaps emerge in the integration of stakeholder groups, in the connection between different digital channels and functions, and in the capacity of current solutions to address administrative, operational, economic, and relational dimensions within a shared infrastructural logic. It is precisely on the basis of this combined analytical path (theoretical framing, contextual diagnosis, and comparative assessment of market solutions) that the present chapter develops a conceptual proposal for an integrated digital condominium ecosystem.

The proposal does not aim to introduce a fully engineered platform or to claim a definitive technological model. Instead, it seeks to translate the main findings of the research into a design-oriented framework capable of responding more coherently to the structural fragmentation of the condominium context, by outlining a possible ecosystem logic through which actors, services, and interactions may be connected in a more transparent, traceable, and stakeholder-responsive way.

Section “6.1 *From comparative findings to design logic and goals*” reconstructs the design logic underlying the proposal, identifying the structural limitations of existing solutions and the five strategic objectives that guide the conceptual framework. Section “6.2 *Ecosystem configuration map and stakeholders role*” translates this logic into an ecosystem configuration map, describing the three main actor groups, their differentiated access points, and the four categories of flows (informational, communicative, operational, and economic) that structure the system's architecture. Section “6.3 *Core functional layers and key features*” articulates the ecosystem into three interrelated functional layers (an informational and transparency layer, an operational and service orchestration layer, and a participation and community layer) and explains how the six analytical dimensions developed in the previous chapters are reorganized within this architecture. Finally, Section “6.4 *Limits, Barriers and Scalability*” reflects critically on the limits of the conceptual proposal, the structural and contextual barriers that may constrain adoption, and the conditions that may support scalability across different condominium typologies, before identifying possible directions for future research.

6.1 From comparative Findings to Design Logic and Goals

The comparative analysis developed in the previous chapter has shown that existing PropTech solutions provide useful but partial responses to the needs emerging in the condominium context. While several platforms support communication, document sharing, and operational coordination, a more integrated response remains limited, especially when economic readability, shared service management, and the relational dimension are considered together. Moreover, what the analysis revealed is that many tools

are still strongly centered on the condominium manager or on B2B relationships with service providers, while residents tend to appear mainly as end-users of interfaces rather than as active stakeholders in the governance of the system.

For this reason, the conceptual proposal developed in this thesis does not introduce another isolated digital tool or application, nor does it aim to replicate current PropTech products. Rather, it outlines a condominium-level digital ecosystem conceived as a shared socio-technical backbone able to connect actors, information, operational processes, and service interactions within a more traceable and integrated environment.

The proposal starts from a simple assumption. In the condominium context, many activities already exist in digital or semi-digital form, but they remain fragmented across emails, messaging applications, paper archives, accounting software, noticeboards, informal exchanges, and unconnected service interfaces. As a result, documents may be technically available but difficult to retrieve, requests may be communicated but not traceable, interventions may be performed but not fully visible to residents, and economic decisions may be formalized but not easily readable by non-professional actors. The problem, therefore, is not only the absence of digital functions, but, as explained many times, the absence of a shared framework capable of linking them within a continuous service environment. Simply adding new punctual functionalities to existing tools would not in itself solve this systemic fragmentation. For this reason, the key challenge will be not to accumulate functions, but to reorganise how information flows, processes, and relationships will be structurally connected across the condominium ecosystem.

Within this perspective, the digital condominium ecosystem is conceived as an informational, operational, and relational environment that connects actors through shared access points and traceable workflows. More precisely, it is conceived as a modular and interoperable backbone, or platform logic, that can aggregate and connect different interfaces and specialist tools rather than replacing them altogether. The concept does not assume a fully centralized or monolithic platform. Instead, it seeks to reduce fragmentation and improve visibility across the main dimensions of condominium life while enabling a more coherent interaction between the main stakeholders.

The proposal is guided by five design strategies:

1. Improve transparency and clarity of documents, decisions, interventions, and financial information for both professional and non-professional actors.
2. Structure communication and operational coordination through shared and traceable workflows rather than through parallel informal channels.
3. Support the management of common spaces, recurring services, and service-related responsibilities within the same digital environment.
4. Strengthen resident participation by providing accessible interfaces for information access, feedback, low-intensity consultation, and community interaction so that residents are not positioned solely as final recipients of communications or services.
5. Configure the condominium as a connected service ecosystem in which managerial efficiency, economic accountability, and relational quality are treated as interdependent rather than separate objectives, within a modular structure that can progressively interface with existing tools.

On this basis, the digital condominium ecosystem will be articulated into a service configuration map and three core functional layers. The service configuration clarifies who interacts with the ecosystem, through which access points, and along which main flows. The layered architecture then explains how

the ecosystem reorganizes the six analytical dimensions identified in the previous sections into a more coherent and design-oriented conceptual proposal.

6.2 Ecosystem Configuration Map and Stakeholders Role

The proposed ecosystem can be described through three main actor groups, four main access points, and four main categories of flows. Framing the concept in this way helps clarify that the condominium is not simply a building supported by a digital platform, but a network of recurrent interactions among actors who occupy different positions, have different informational needs, and enter the system through different interfaces.

In line with the analysis presented in the previous chapters, the first group is represented by residents, including owners and tenants, who primarily need access to documents, notices, updates, reporting tools, booking systems, and participation channels. The second group is represented by condominium managers, who occupy a central coordination role and are therefore involved in publishing information, supervising workflows, organizing communications, validating requests, and linking operational activities to formal decision-making and financial accountability. The third group includes service providers such as maintenance operators, technical suppliers, cleaners, insurance actors, and other external partners involved in recurring or occasional interventions, who need access to information and data necessary to perform their work, as well as a clear and manageable communication channel to communicate with the parties involved quickly and effectively.

These three actor groups constitute the core users of the proposed digital condominium ecosystem. In selected cases, the system may also interface with external or institutional actors, such as non-resident owners, local partners, or public bodies, but these are not considered primary users within the present conceptual proposal.

More important, these actors do not enter the ecosystem through a single undifferentiated interface. Rather, the architecture assumes a differentiated system of access points. Residents may interact mainly through a mobile application or web portal designed for consultation, notifications, requests, bookings, and low-threshold participation. Condominium managers may rely on an administrator dashboard through which they can publish documents, monitor workflows, supervise service coordination, manage communications, and access reporting functions. Service providers may enter the ecosystem through a dedicated workspace that allows them to receive assignments, update intervention status, upload technical documentation, and support traceability in service execution. In addition, the concept allows for optional physical touchpoints, such as digital noticeboards in common areas, which can reinforce the connection between online and offline condominium life by mirroring essential information in accessible shared spaces.

From the point of view of system logic, the ecosystem is structured around four main categories of flows. Informational flows concern the circulation of regulations, minutes, notices, deadlines, intervention histories, accounting summaries, and other building-related documents made accessible through the platform. Communication flows concern notifications, bidirectional exchanges between residents, managers, and providers, feedback loops, consultation prompts, and selected community-oriented interactions. Operational flows concern fault reporting, ticketing, task assignment, intervention updates, approvals, bookings, and service coordination processes. Economic flows concern payment reminders, fee breakdowns, cost allocation mechanisms, invoice visibility, and all forms of traceability related to expenses and financial responsibilities.

The logic of the ecosystem can be synthesized as follows (*Diagram 8*).

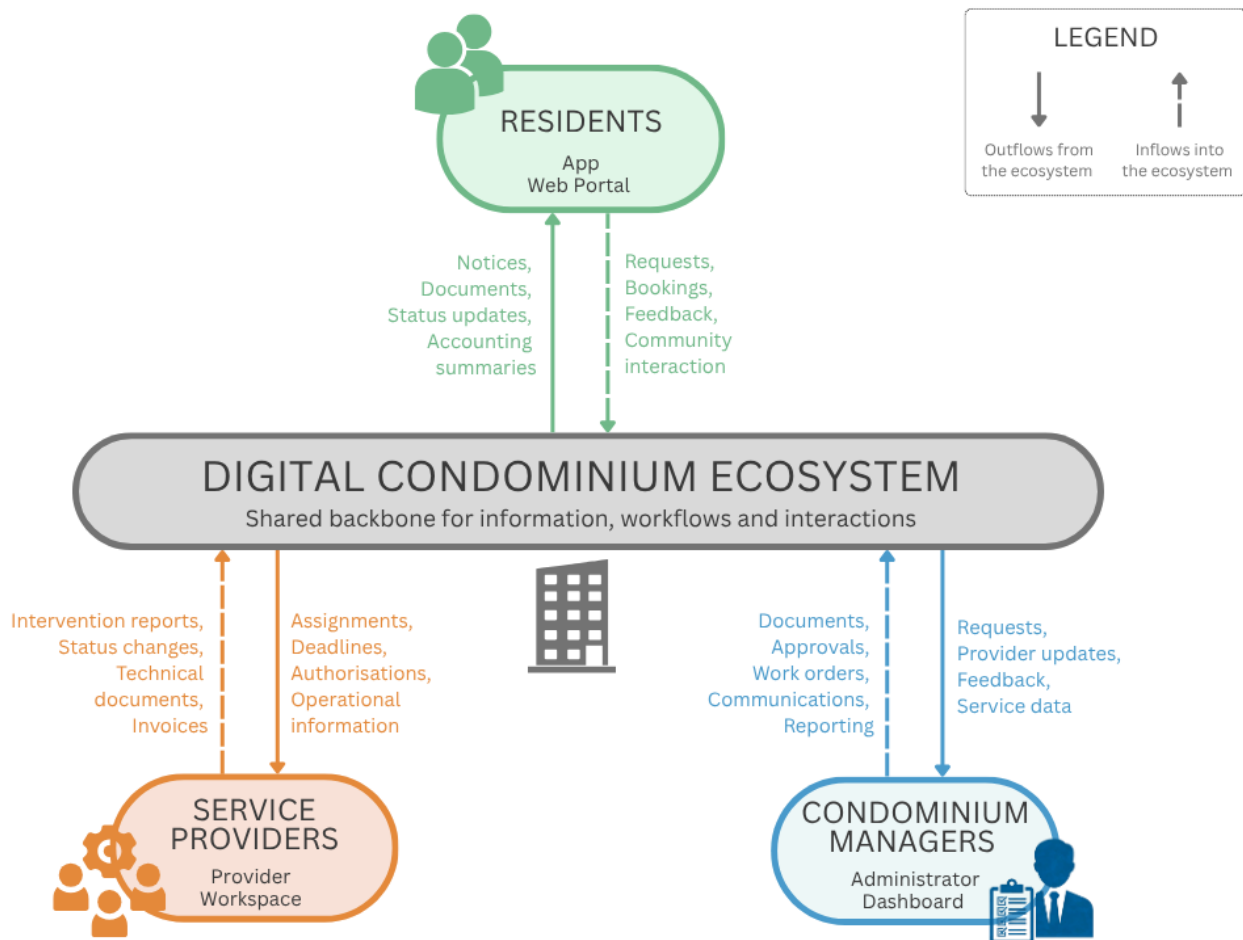


Diagram 8: Ecosystem configuration map of the proposed digital condominium ecosystem, showing the three core actor groups, their main access points, and the principal inbound and outbound flows. Source: Own Elaboration

Compared with the current fragmented configuration, the backbone reduces channel proliferation and duplication by concentrating the most relevant interactions into a limited number of coordinated interfaces. This enhances the traceability of documents, requests, and decisions over time, and makes it easier to reconstruct who did what, when, and on the basis of which information. At the same time, it does not eliminate specialist tools, but connects them through a shared logic of visibility, interoperability, and workflow continuity.

6.3 Core Functional Layers and Key Features

Building on this configuration map, the digital condominium ecosystem is articulated into three interrelated layers: an informational and transparency layer, an operational and service orchestration layer, and a participation and community layer. These layers should not be interpreted as rigidly separated modules, but as complementary domains of infrastructural action. The layered structure makes it possible to clarify what the ecosystem is functionally made of and how the six analytical dimensions developed in this thesis are reorganized into a more manageable architectural logic, without corresponding one-to-one to autonomous modules. The first makes information visible and understandable, the second organizes processes and services, and the third supports relational quality and forms of participation that can improve the social sustainability of condominium life. In some cases, such as with communication and economic-accounting functions, these cut across these layers, connecting them and reinforcing their systemic integration.

Informational and transparency layer

The first layer is designed to create a shared visibility infrastructure for the main documentary and decision-related elements of condominium life. In fragmented environments, access to information often depends on personal initiative, private exchanges, or opaque administrative mediation. One of the central functions of the proposed ecosystem is therefore to make relevant information more continuously available, better organized, and easier to interpret over time. This layer would include repositories for documents, assembly minutes, notices, condominium regulations, intervention archives, deadlines, reminders, accounting summaries, and synthetic indicators related to the state of the building and its ongoing activities. Its function, however, is not simply archival. A purely documental repository would reproduce the limits of many existing systems in which information is technically present but practically difficult to use. The added value of this layer lies in the readable and role-based presentation of information, through which residents can access essential content without needing technical expertise, while managers maintain the capacity to validate, publish, and structure what becomes visible. The actors primarily involved in this layer are residents and condominium managers, although selective access may also be granted to non-resident owners and, where appropriate, to service providers. The channels used would mainly include the resident app, the web portal, the administrator dashboard, and, in a more limited and curated form, optional physical noticeboards capable of displaying essential communications in shared areas. By connecting documentary access with temporal traceability, this layer improves transparency, reduces information asymmetries, and allows users to reconstruct not only what has been decided, but also how specific processes have evolved over time.

Operational and service orchestration layer

If the first layer makes the condominium more visible, the second makes it more governable in practice. The operational and service orchestration layer is designed to connect requests, interventions, bookings, and recurring services within structured workflows that can be followed from initiation to closure. In the current condominium context, many operational activities are handled through discontinuous chains of calls, emails, messages, and manual follow-ups. This generates delays, uncertainty, duplicated exchanges, and weak accountability across the life cycle of a task. The proposed layer addresses this issue by introducing a coordinated workflow logic. Fault reporting, ticket opening, task routing, intervention planning, work-order management, supplier coordination, status updates, bookings of common spaces, and service-related allocation mechanisms are all organized within the same environment. In this way, operational activity is no longer treated as a series of disconnected events, but as a traceable chain in which requests, responsibilities, timings, and outcomes are linked to one another. This layer directly involves residents, managers, and service providers. Residents can open requests, report problems, book spaces, and track service-related updates. Managers can validate, prioritize, assign, supervise, and close workflows. Providers can receive assignments, update progress, upload reports, and contribute to service traceability. The main channels used are the resident app or portal, the administrator dashboard, the provider workspace, and, where possible, APIs or integrations with other existing management software. The value delivered by this layer lies not only in efficiency, but also in the reduction of ambiguity: actors gain a clearer understanding of who is responsible for what, at which stage, and with what connection to the broader condominium service environment. This is also the layer in which service-oriented condominium logics become most visible. The management of common spaces, recurring amenities, and shared services can be integrated into the same system that already coordinates maintenance and everyday requests. As a result, the ecosystem moves beyond the purely reactive management of problems and begins to support a more proactive and service-based residential model.

Participation and community layer

The third layer is dedicated to the relational and participatory dimension of condominium life. This part of the concept starts from the recognition that many of the tensions emerging in the condominium context are not exclusively administrative or operational. They are also relational. Conflict, low trust, weak participation, social heterogeneity, and resident turnover affect the quality of coexistence and often influence how formal processes are perceived and accepted. For this reason, a digital condominium ecosystem cannot be reduced to a management infrastructure alone; it must also provide bounded spaces for interaction that support a more constructive social environment. The participation and community layer is not conceived as a generic social network. Its purpose is more specific and more limited. It provides structured feedback channels, topic-based communication spaces, micro-surveys on non-formal issues, resident initiative boards, mutual-help functions, and selected tools for community-related activities or service feedback. These instruments are designed to lower the threshold for participation while avoiding the uncontrolled dynamics of open and unmoderated discussion environments. The actors mainly involved are residents, while condominium managers may act as facilitators or moderators where necessary. In specific cases, service providers may also enter selected feedback loops related to service quality or intervention evaluation. The channels used are primarily the resident app, the web portal, notification systems, and optional digital noticeboards for selected calls to action or shared prompts. The main value delivered by this layer lies in its capacity to strengthen reciprocity, trust, and sense of belonging. By connecting participation to concrete aspects of condominium life, rather than to abstract community rhetoric, the ecosystem can support more active involvement and help address tensions before they escalate into deeper relational breakdowns.

The three layers are synthesized in the following table (*Table 16*).

LAYER	PURPOSE	CORE FUNCTIONS	ACTORS INVOLVED	CHANNELS USED	VALUE DELIVERED
INFORMATIONAL AND TRANSPARENCY LAYER	To create a shared visibility infrastructure for documents, decisions, deadlines, intervention history, and essential accounting information.	Document repository, minutes archive, notices, regulations, intervention history, accounting summaries, reminders, synthetic indicators.	Residents, condominium managers, selective access for service providers and non-resident owners.	Resident app, web portal, administrator dashboard, optional digital noticeboard.	Greater transparency, readability, traceability, and lower information asymmetry.
OPERATIONAL AND SERVICE ORCHESTRATION LAYER	To coordinate requests, interventions, bookings, and recurring services through structured workflows.	Ticketing, task assignment, work orders, provider coordination, bookings, amenity management, service allocation logics.	Residents, managers, providers, selected external actors.	Resident app/web portal, administrator dashboard, provider workspace, APIs.	Better coordination, clearer responsibilities, lower duplication, stronger service integration.
PARTICIPATION AND COMMUNITY LAYER	To support low-threshold participation, relational quality, and community-building.	Feedback channels, topic-based discussions, micro-surveys, resident initiatives, mutual-help tools, service feedback.	Residents, managers as facilitators/moderators, selective provider involvement.	Resident app, web portal, notifications, optional digital noticeboard.	Stronger trust, reciprocity, belonging, and more active resident engagement.

Table 16: Core layers of the proposed digital condominium ecosystem. Source: Own Elaboration

Taken together, these three layers allow the concept to respond to the condominium ecosystem in a more integrated way than the solutions analyzed in the previous sections. The informational layer improves access and legibility, the operational layer structures action and service coordination, and the participation layer gives space to relational maintenance and low-intensity forms of collective engagement. As already explained, their combination is what turns the platform from a management tool into a more ecosystem-oriented infrastructure.

Moreover, their integration is what allows the proposed ecosystem to respond coherently to the six analytical dimensions developed in this thesis. However, at the same time, not all analytical dimensions correspond to autonomous layers. Some of them act across the architecture as transversal capacities. Communication, for example, is distributed between the informational layer and the participation layer, while also enabling continuity inside operational workflows. Similarly, economic-accounting accountability is partly embedded in the informational layer, through readable summaries and financial visibility, and partly in the operational layer, through the traceability that links activities, responsibilities, costs, and service processes. This transversal logic is important because it avoids an excessively rigid platform model and preserves the conceptual coherence of the proposal.

The relationship between the six analytical needs identified in the previous sections, the three layers of the proposed ecosystem, and the main functions attributed to each of them is summarized below (*Table 17*).

ANALYTICAL NEEDS	CORE LAYER(S) MAINLY INVOLVED	MAIN FUNCTIONS IN THE PROPOSED ECOSYSTEM
1. Informational transparency and data access	Informational and transparency layer.	Document repository, minutes archive, notices, intervention history, readable summaries, role-based access.
2. Communication channels	Informational and transparency layer; Participation and community layer.	Structured notices, notifications, topic-based communication, feedback channels, mirrored physical touchpoints.
3. Operational management and coordination	Operational and service orchestration layer.	Ticketing, work orders, task routing, provider coordination, workflow tracking, intervention status.
4. Economic-accounting management and accountability	Informational and transparency layer; Operational and service orchestration layer.	Accounting summaries, payment reminders, expense visibility, cost allocation, traceable process links between actions and costs.
5. Space and service management	Operational and service orchestration layer.	Booking systems, amenity management, shared-service coordination, calendars, allocation rules.
6. Relational and community dimension	Participation and community layer.	Micro-consultations, resident initiatives, mutual-help tools, service feedback, community interaction spaces.

Table 17: Alignment between six analytical needs, ecosystem layers, and main functions. Source: Own Elaboration

It is important to notice that the three layers do not constitute a prescriptive blueprint, but rather a functional architecture and the value of this proposal lies precisely in its integrative logic: no single layer is sufficient on its own, and the main and most common gaps identified in the comparative analysis (the absence of cross-stakeholder integration, the weakness of community-oriented functionalities, the fragmentation of accountability mechanisms) can only be addressed if the three dimensions are designed and governed in relation to one another.

However, this conceptual proposal does not yet define a specific governance or implementation model. Those aspects are discussed in the following section, where the focus shifts from the architecture of the ecosystem to the organizational conditions, barriers, and scalability issues that may shape its possible adoption.

6.4 Conditions for Digital Condominium Ecosystem Growth

The conceptual proposal outlined in the previous section provides a design-oriented model for rethinking the condominium as a more integrated digital ecosystem. Its relevance, however, depends not only on the internal coherence of the architecture proposed, but also on the conditions under which such an ecosystem could realistically be adopted, used, and sustained over time. For this reason, this section shifts the focus from the functional structure of the concept to its main limitations, the barriers that may constrain adoption, and the conditions that may support scalability across different condominium contexts.

6.4.1 Conceptual and Methodological Limits

A first limit of the proposed digital condominium ecosystem concerns the nature of the thesis itself. The outcome developed in this chapter is a design-oriented conceptual proposal grounded in problem framing, desk research, and comparative interpretation rather than in the direct implementation or empirical testing of a platform in real condominium settings. As a result, the proposal should be understood as an interpretative and projective model that aims to organize the main needs, functions, and socio-technical relationships identified in the analysis into a coherent architectural hypothesis.

This conceptual nature implies several analytical and methodological limitations. First, the proposal has not been validated through direct engagement with residents, condominium managers, or service providers, and its practical usability, acceptability, and organizational fit remain to be assessed empirically. Second, the concept does not specify a detailed technical architecture, governance arrangement, business model, or implementation roadmap. These dimensions were deliberately kept in the background in order to preserve the exploratory orientation of the thesis, but their absence limits the extent to which the proposal can be translated into operational terms without further development.

A further constraint derives from the empirical basis of the work. The desk-research comparative analysis is well suited for identifying functional patterns, recurring gaps, and ecosystem orientations across the selected PropTech solutions, but less suited to capturing situated practices of use, informal workarounds, organizational resistance, and the everyday politics of condominium management. In this sense, the proposal is stronger as a synthetic and analytical design framework than as a predictive model of adoption outcomes in real-life settings.

Finally, the concept necessarily simplifies the diversity of condominium realities. Buildings differ significantly in terms of size, socio-demographic composition, service complexity, managerial capacity, and digital maturity, and the proposed model cannot fully reflect the variety of local organizational cultures and governance arrangements that shape actual condominium life.

6.4.2 Adoption Barriers in the Condominium Context

Beyond the limits of the conceptual model itself, a second level of reflection concerns the barriers that may hinder or slow the adoption of more integrated digital ecosystems in condominiums. As the analysis developed throughout the previous chapters suggests, the slow and uneven digitalization of the condominium context cannot be explained only by the availability or the absence of technological solutions. Rather, it reflects the organizational, cultural, economic, and infrastructural characteristics

of a fragmented socio-technical ecosystem in which adoption is structurally more complex than in centrally managed residential settings.

A first set of barriers is therefore structural. Unlike most service or commercial real estate environments, the condominium does not have a single actor capable of imposing digital adoption in a top-down way. Property is fragmented, decision-making is collective, and the introduction of significant changes typically requires assembly consent, alignment among multiple owners, and a degree of organizational readiness that is not always present. Even when a potentially useful solution exists, its introduction may be delayed by veto points, low participation in decision-making, conflicting preferences, or by the difficulty of transforming a shared need into a collectively supported investment.

A second set of barriers is professional and cultural. The case-study analysis has shown that most existing solutions are heavily centered on administrators, dashboards, and back-office coordination functions, confirming the pivotal role of the condominium manager as the main gatekeeper of digital coordination. At the same time, however, the condominium administrator profession has historically developed around legal, operational, accounting, and relational competences rather than digital innovation capabilities. For this reason, the adoption of a more integrated backbone may encounter resistance linked not only to technical skill gaps, but also to professional habits, path dependency, and the perception that new digital layers may increase complexity rather than reduce it. Where administrators already rely on heterogeneous routines, spreadsheets, phone calls, messaging apps, and legacy management tools, the transition towards a structured ecosystem logic may be perceived as disruptive, time-consuming, or insufficiently aligned with everyday practice.

A third set of barriers concerns trust, data governance, and control over the platform. The proposed ecosystem circulates documents, requests, financial data, service updates, and interaction records across multiple actors and interfaces. This logic immediately raises questions about who governs access, who controls data, and how visibility is distributed between professional and non-professional stakeholders. Residents may be concerned about privacy, data ownership, and the risk of monitoring or opaque use of personal information. Administrators may resist systems that increase transparency if this is perceived as reducing professional discretion or exposing management activities to greater scrutiny. The problem, therefore, is not simply whether data can be collected, but under which rules, responsibilities, and trust conditions a shared digital backbone can be considered legitimate. In this sense, data governance is not a technical issue alone, but a question of trust and legitimacy that must be addressed as a precondition for adoption.

A fourth barrier is economic. Although digitalization is often associated with efficiency gains, its adoption requires upfront and recurrent investments that may be difficult to justify in many condominium settings, especially smaller ones or those with limited budgets and low service intensity. Setup activities, migration of archives, onboarding, training, maintenance, and technical support all imply costs that are not always easily distributed within the logic of condominium expenditure. In addition, the subscription model typical of most PropTech solutions may fit poorly with the way condominium spending is perceived and approved, especially where the distinction between ordinary and extraordinary costs still structures collective decision-making on investments. As a result, even solutions that appear affordable from a provider perspective may be resisted at building level if their economic value is not immediately legible or collectively easy to legitimize.

A fifth barrier is infrastructural and interoperable in nature. As the comparative analysis has shown, current solutions remain largely specialized, partially connected, and uneven in their use of APIs, integrations, and IoT interfaces. The transition towards a digital backbone therefore does not start from neutral ground, but from a landscape of heterogeneous tools, isolated databases, unstandardized archives, and fragmented routines. Without shared technical standards and interoperable interfaces

between administrator software, resident apps, supplier workspaces, and building systems, ecosystem integration risks reproducing the same fragmentation it aims to overcome. In this sense, adoption barriers are not only human or organizational, but also infrastructural: an ecosystem logic requires a level of technical coordination that many current solutions and practices do not yet fully support.

Taken together, these barriers suggest that the slow digitalization of the condominium context should not be interpreted as a simple delay in technology uptake. Rather, it reflects the complexity of a context in which collective governance, fragmented property, professional mediation, uneven digital readiness, and weak interoperability converge. This is precisely what makes the design-oriented perspective of this thesis relevant: rather than assuming a frictionless adoption, the conceptual proposal makes explicit the organizational and infrastructural conditions that any meaningful digital transformation of the condominium would have to address.

6.4.3 Scalability Conditions

If the previous section has focused on adoption barriers, the issue of scalability requires a slightly different perspective. The question is not only whether a digital condominium ecosystem can be adopted, but under which conditions it may be extended, replicated, or stabilized across a broader range of buildings and organizational contexts. Since condominiums differ considerably in size, governance, actor composition, and service complexity, scalability should not be understood as the simple replication of a standard platform, but as the capacity to adapt a common infrastructural logic to differentiated settings.

A first condition is modularity. As discussed in section “6.1 *From comparative findings to design logic and goals*”, the proposed ecosystem is not conceived as a monolithic solution, but as a layered and modular infrastructure. This means that adoption can be progressive with differentiated entry points: some contexts may start from the informational and transparency layer, where the value proposition is more immediate and easier to legitimize collectively; others may enter through operational coordination, space-and-service management, or community functions. The possibility of incremental adoption significantly increases the practical scalability of the ecosystem in a context characterized by heterogeneous readiness and variable organizational capacity.

A second condition concerns the organizational infrastructure capable of supporting standardization across multiple buildings. At the level of a single condominium, the effort required to adopt and sustain an integrated digital ecosystem may be disproportionate. Scalability becomes more plausible, instead, when the platform is promoted through administrator networks, property management portfolios, or PropTech providers operating across multiple residential assets, where costs, routines, and organizational learning can be distributed and shared. Scale, in this sense, is not only a technical property of the platform but also a relational and organizational property of the broader actor network in which it is embedded.

A third condition is the alignment between the platform logic and the characteristics of the residential context. Buildings with more shared spaces, a stronger service component, greater coordination complexity, or higher digital readiness are likely to offer more fertile ground for ecosystem adoption, because the perceived value of traceability, structured workflows, and participatory functions is higher. In smaller or more traditional condominiums with limited shared services and minimal managerial complexity, by contrast, the full ecosystem logic may appear disproportionate to perceived needs. Scalability therefore depends on aligning the depth of the proposed infrastructure with the actual governance and service profile of each condominium type.

Finally, a relevant condition concerns the capacity to demonstrate value across different stakeholder groups. As the comparative analysis has shown, one of the structural weaknesses of current solutions

is the uneven distribution of benefits between administrators, providers, and residents. An ecosystem that delivers value only to administrators or only to residents will remain confined to a partial implementation. A scalable backbone, instead, must produce recognizable returns for all core stakeholders: greater transparency and participation for residents, more standardized and legible workflows for administrators, and more efficient coordination and traceability for service providers. Without this multi-actor value proposition, the platform risks remaining confined either to a back-office managerial tool or to a partial resident interface, rather than evolving into a true ecosystem infrastructure.

6.4.4 Possible Future Implementations

The limits and barriers discussed above point to several directions for future research. A first priority is empirical validation. Future studies could test the conceptual architecture proposed in this thesis through interviews, co-design workshops, or ethnographic fieldwork involving residents, condominium managers, and service providers. This would allow assessment of which functions are perceived as most valuable, which barriers are most significant in practice, and which trade-offs emerge between transparency, usability, and governance.

A second direction concerns governance and business models. Since one of the key barriers identified relates to legitimacy and data control, future research could compare different configurations for activating the digital backbone, for example administrator-led, network-based, PropTech-provider-driven, or hybrid institutional arrangements. This would clarify under which organizational and governance conditions a shared digital ecosystem is both feasible and acceptable for the different actors involved.

A third line of research concerns prototyping and incremental implementation pathways. Rather than evaluating the concept as a complete ecosystem from the outset, future work could explore which layer or function serves as the most realistic and effective entry point in different condominium typologies, and how adoption tends to evolve once a first function is established. This would help translate the conceptual model into a more differentiated and evidence-based implementation logic.

Finally, future research could deepen the relationship between condominium digitalization and broader transformations in housing, service delivery, and socio-technical governance. The condominium is not only an administrative unit, but a site where property, service provision, everyday coexistence, and digital mediation increasingly intersect. For this reason, studying digital condominium ecosystems can contribute not only to PropTech research, but also to wider debates on platform urbanism, service-oriented housing, domestic data governance, and the changing infrastructures of collective living.

7. Conclusions

7.1 Main Findings and Contributions

This thesis sets out to investigate how digital technologies and PropTech solutions can contribute to a more integrated, transparent, and stakeholder-responsive condominium ecosystem. The relevance of this objective lies in a clear gap within the Italian residential sector: although the digital transformation of real estate has been widely explored in relation to transactions, smart buildings, and property or asset management, the condominium has remained comparatively underexamined despite its structural centrality in the Italian housing landscape. Addressing this gap required moving beyond a narrow legal or administrative understanding of the condominium and interpreting it instead as a residential context in which wider changes in housing, governance, services, and user expectations become particularly visible.

Starting from this premise, the research moved from the wider transformations affecting the real estate and residential sectors. As discussed in Chapter “2. *Theoretical Background: Evolution of the Real Estate Sector and New Housing Needs*”, demographic change, urbanization, sustainability pressures, and technological innovation are reshaping both housing demand and the ways in which residential environments are managed and experienced. Within this transition, residential value can no longer be read solely through physical space or ownership structures, since it increasingly depends on the quality of services, interactions, accessibility, and organizational arrangements that support everyday life. In this perspective, the Italian condominium emerges as a widespread but fragile configuration, one that concentrates many of the tensions produced by the growing mismatch between traditional governance structures and contemporary residential needs.

Seen through this lens, the condominium appears less as a static building typology and more as a fragmented micro-ecosystem of actors, services, and relationships. This reframing is one of the central contributions of the thesis because it shifts attention away from isolated inefficiencies and toward the systemic interdependencies that shape condominium life. Problems that are often perceived as individual or operational, such as communication delays, poor transparency, weak coordination, or unclear responsibilities, can thus be understood as expressions of a broader governance condition rather than as disconnected shortcomings.

The methodological path developed in Chapter “3. *Research Framing and Methodology*” was designed precisely to sustain this broader interpretation. By adopting a qualitative and desk-research-based approach, the thesis connected macro-level transformations in housing with the internal dynamics of condominium life and with the emerging role of digital innovation. Rather than focusing on the validation of a single technological product, the research built a coherent analytical sequence in which contextual reconstruction, stakeholder diagnosis, comparative analysis of PropTech solutions, and design-oriented reflection could inform one another. This structure made it possible to move from a general understanding of housing transformation to a focused interpretation of the condominium as a specific field of socio-technical complexity.

This complexity became more visible through the diagnostic work developed in Chapter “4. *The Italian Condominium context: Physical Structure and Stakeholder Needs*”. The thesis showed that the condominium operates as a socio-technical environment in which residents, owners, condominium managers, and service providers are strongly interdependent, while at the same time holding different expectations, responsibilities, and constraints. Many of the tensions affecting condominium life emerge precisely at the intersections among these actors, where fragmented communication, low traceability, limited transparency, and weak coordination of services tend to accumulate. What emerges, therefore,

is not simply a series of isolated operational issues, but a system whose governance has become more complex without becoming equally more integrated.

Building on this diagnosis, Chapter “5. *Digitalization as a driver of change in the condominium context*” translated the main criticalities of the condominium context into an analytical framework capable of interpreting its digitalization gap. By reorganizing dispersed stakeholder issues into broader dimensions of need and evaluative criteria, the thesis created a more structured basis for assessing existing digital solutions in relation to the actual governance challenges of the condominium ecosystem. This passage is especially significant because it transformed a descriptive account of problems into a comparative framework through which digital innovation could be examined in a more grounded and systematic way.

The analysis of selected PropTech solutions then showed that the market already offers a variety of tools able to address relevant needs linked to communication, operational management, financial visibility, maintenance, and interaction among stakeholders. At the same time, the results suggested that many of these solutions still address only parts of the overall problem, since they are often oriented toward specific functions or user groups rather than toward the integration of the ecosystem as a whole. In this respect, the thesis does not argue that digital solutions are absent, but rather that their current configuration often remains only partially aligned with the organizational and relational complexity of condominium life.

The design-oriented conceptual proposal developed at the end of the thesis should be read in this light. Its contribution does not lie in presenting a finalized platform, but in outlining a direction for innovation grounded in the findings of the research. What ultimately emerges is that digitalization becomes meaningful when it is able to connect stakeholders, services, information flows, and governance mechanisms within a more coherent residential framework. For this reason, the condominium should not be considered a marginal segment of the housing sector, but a strategic site in which the broader challenges of service integration, user responsiveness, and digital transition become especially visible.

7.2 Implications and Limitations

The implications of this research operate on several interconnected levels. At a conceptual level, the thesis suggests that the condominium deserves a more central place within contemporary housing and real estate studies, particularly when residential systems are interpreted through service-oriented, relational, and ecosystem-based perspectives. In this sense, the research expands the discussion on housing transformation beyond highly visible emerging formats such as co-living or student housing and redirects attention toward more ordinary, yet structurally significant, residential contexts in which service complexity and governance fragmentation remain deeply embedded.

The practical implications are equally relevant. The findings indicate that digitalization in the condominium context cannot be reduced to the simple introduction of software into pre-existing administrative routines. For condominium managers and other professionals, the central question is whether digital tools can support more effective coordination, clearer information exchange, higher transparency, and greater responsiveness within a setting marked by recurring frictions among actors. For residents and owners, the issue concerns the possibility of making condominium processes more understandable, accessible, and traceable, thereby reducing information asymmetries and enabling more balanced relationships within shared residential environments.

The thesis also offers useful indications for PropTech actors and for broader innovation strategies in the residential field. The analysis suggests that future value creation is likely to depend less on the multiplication of isolated functionalities and more on the capacity to design interoperable, stakeholder-aware, and ecosystem-oriented solutions. From this perspective, the condominium can be regarded as

a particularly relevant testing ground for forms of innovation that combine digital infrastructures, service integration, and user-centered governance instead of merely optimizing individual tasks.

At a wider scale, the research also contributes to the interpretation of the Italian residential sector. The enduring importance of condominium housing, the aging building stock, the growing relevance of maintenance and energy-related interventions, and the increasing expectations associated with residential services all point toward a context in which innovation cannot be separated from broader changes in housing demand, sustainability pressures, and governance complexity. The digitalization of condominium life should therefore be understood not as an isolated trend, but as part of a broader transition in which residential environments are increasingly expected to become more adaptive, service-responsive, and legible to their users.

At the same time, the scope of the thesis is shaped by a number of limitations.

From a methodological point of view, the thesis is based primarily on desk research and interpretative analysis rather than on extensive primary empirical data collection. As a consequence, the research does not aim to produce statistically generalizable findings about all condominium stakeholders or all digital solutions operating in the market.

At the same time, the research analyzed only the Italian context and even if this geographical focus allows for more in-depth and context-sensitive investigation, it also limits the direct generalizability of the results and findings to other national contexts, where ownership structures, regulatory frameworks, and levels of PropTech maturity may significantly differ.

Moreover, the analytical framing of stakeholder needs and criticalities is derived from the literature, sector documentation, and the contextual analysis developed in the thesis itself. While this approach allows for a coherent and theoretically grounded interpretation of the condominium ecosystem, it also means that the identified categories depend on the quality, availability, and interpretative treatment of the sources considered.

It is also important to notice that the comparative case study analysis of digital solutions is necessarily partial and selective. The chosen cases are intended to be analytically representative rather than exhaustive, and the evaluation focuses on observable functionalities and organizational implications rather than on proprietary performance data, internal business metrics, or user satisfaction data that may not be publicly accessible.

A further limitation concerns the nature of the final outcome of the research. The conceptual proposal should be understood as a strategic and exploratory contribution rather than as the validation of a specific technological system, platform, or business model. Its purpose is to synthesize the implications of the analysis and to clarify a possible direction for innovation, not to demonstrate the immediate feasibility of a ready-to-implement solution.

These limitations do not weaken the significance of the thesis, but rather help define its contribution more precisely: its primary value lies in offering an interpretative and analytical framework through which the condominium can be understood as a complex residential ecosystem and as a meaningful domain for digital and organizational innovation.

7.3 Future Research Directions

The study opens several avenues for further research. A first concerns the empirical validation and refinement of the framework developed here, through interviews, focus groups, surveys, or mixed-method approaches involving residents, owners, managers, and service providers in different territorial

and organizational contexts. This would help verify how the needs and tensions identified through desk research are perceived in practice and how they vary across different condominium types.

A second direction relates to the further development of the analysis of digital solutions. Future work could broaden the sample of PropTech cases, refine the evaluative criteria, and include dimensions such as implementation outcomes, user adoption, and interoperability, moving from a mainly functional comparison toward a more robust understanding of which digital configurations work under which conditions.

Further progress could also come from more direct forms of experimentation and design. The conceptual proposal could be translated into prototypes, pilot projects, or co-design processes with stakeholders, to explore how ecosystem-oriented digital solutions are received, negotiated, or even resisted in real condominium environments. Such developments would be especially valuable for identifying the organizational, cultural, and regulatory conditions that may support or hinder long-term adoption.

At the same time, further research could extend the perspective beyond the Italian context, comparing condominium systems and digitalization paths in different European housing regimes, and situating condominium innovation within wider agendas such as energy retrofitting, accessibility, aging in place, and smart services. Longitudinal studies would finally be valuable for observing how digital tools, once introduced, are embedded into routines, reshape expectations, and transform relationships and governance practices over time.

Ultimately, this thesis suggests that the future of condominium innovation will depend not on the proliferation of isolated digital tools, but on the capacity to align technological infrastructures with stakeholder needs, service relations, organizational practices, and the evolving nature of housing. In this sense, the condominium represents a strategic site for rethinking how digitalization, service integration, and residential governance can be developed together.

In addition to these broader implications and lines of research, the dissertation also had a more personal impact on the way I view the condominium context and digital innovation in this field. Beyond the analytical findings and the conceptual framework developed, this work first and foremost allowed me to gain a deeper understanding of the condominium context, its regulatory framework, and the concrete practices of administration, accounting, and operational management. It offered me the opportunity to systematically examine the challenges and needs of the various stakeholders involved going beyond the perspective of a condominium unit owner, which is the experience most familiar to me. The research process also allowed me to interact directly with companies operating in the PropTech sector, gaining a better understanding of their challenges, opportunities, and the conditions necessary for effective application within the condominium context. Another element I consider central is having been able to outline a solution that, although developed at a conceptual and theoretical level, can serve as a foundation for future developments and potential implementations. Above all, this thesis gave me the opportunity to explore a topic that stems from a personal interest and to build a research path that I sincerely feel is my own.

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