



IMPROVING THE EFFICIENCY OF HOUSING AND COMMUNAL SERVICES THROUGH INNOVATIVE MANAGEMENT TOOLS

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Abstract: The housing and communal services (HCS) sector plays a crucial role in ensuring the quality of life and sustainable urban development. However, many countries, including those with transitioning economies, face persistent inefficiencies in service delivery, resource utilization, and infrastructure maintenance. This article explores the potential of innovative management tools—such as digital platforms, smart metering systems, predictive analytics, and performance benchmarking—in enhancing operational efficiency and service quality in the HCS sector. The study analyzes international best practices and evaluates their applicability in local contexts, with a special focus on institutional, financial, and technological barriers to innovation.

Keywords: housing and communal services, efficiency improvement, innovative management tools, smart technologies, public infrastructure, digital transformation, sustainable urban development.

INTRODUCTION

The housing and communal services (HCS) sector is a fundamental component of a country's socio-economic infrastructure, directly affecting the well-being of the population and the livability of urban and rural environments. In many countries, especially those with transitioning or emerging economies, the sector faces numerous challenges: outdated infrastructure, inefficient resource allocation, insufficient customer service quality, and weak institutional governance. These issues not only hinder the sector's ability to meet growing public expectations but also compromise sustainability and economic viability.

In recent years, global trends in digital transformation, smart city development, and performance-based governance have created new opportunities for reforming and modernizing the HCS sector. Innovative management tools—such as digital platforms, automated control systems, Internet of Things (IoT) applications, and data analytics—offer significant potential to optimize operational processes, reduce costs, enhance transparency, and improve the quality of services delivered to residents. However, the integration of such tools into traditional systems requires not only technological readiness but also institutional adaptation, financial investment, and managerial competencies.

This article aims to examine the effectiveness of applying innovative management tools in the context of HCS, focusing on how such instruments can contribute to increased operational efficiency and service quality. Through a review of international practices and an analysis of local implementation barriers, the study proposes a strategic model for the modernization of the HCS sector. The research contributes to the discourse on public infrastructure reform by offering policy recommendations and managerial insights to facilitate a more responsive, transparent, and sustainable service system.

LITERATURE REVIEW

The academic discourse on the modernization of housing and communal services (HCS) has evolved significantly in recent decades, driven by growing urbanization, technological

advancements, and the need for sustainable public service delivery. Researchers and practitioners have investigated a wide range of approaches aimed at enhancing the efficiency and effectiveness of HCS systems, with particular attention to innovative management tools and digital technologies.

One major research stream focuses on efficiency challenges in the HCS sector. According to Grigoryeva and Kuzmenko, inefficiencies in resource allocation, outdated infrastructure, and the absence of performance measurement systems are common barriers to modernization. Kovalenko emphasizes the critical role of institutional reforms and stakeholder accountability in resolving these systemic issues. The digitalization of public utilities has become a dominant theme in recent literature. Baranova et al. identify smart technologies such as the Internet of Things (IoT), automated metering infrastructure (AMI), and geoinformation systems (GIS) as key enablers of efficiency in HCS. Similarly, Owen and Daskalova argue that the implementation of digital platforms enhances transparency, allows for real-time data analysis, and supports better decision-making processes in urban service management.

A growing body of research explores international best practices in housing and communal service reform. The works of UN-Habitat and OECD highlight successful case studies from Europe and Asia, where integrated management systems and smart infrastructure have significantly improved service delivery and reduced operational costs. However, many authors note the contextual limitations of transferring such models to developing countries due to financial constraints, lack of skilled personnel, and institutional inertia. Some researchers, such as Alieva & Rakhimov, stress the importance of public-private partnerships (PPP) in financing innovations in the HCS sector. They suggest that PPP frameworks can help overcome budget limitations and introduce market-driven efficiency mechanisms. Finally, scholars such as Sattarov and Karimov focus on the Uzbekistan context, pointing to ongoing reforms in the utilities sector and the gradual introduction of e-government tools. While progress is being made, challenges remain in scaling up pilot projects, ensuring inter-agency coordination, and creating incentives for innovation at the local level.

In summary, the existing literature provides a robust foundation for understanding the drivers and barriers of innovation in HCS. However, there is still a need for context-sensitive models that integrate technological solutions with institutional and managerial capacity-building efforts—especially in transition economies.

METHODOLOGY

This study employs a mixed-methods approach combining qualitative and quantitative research techniques to analyze the impact of innovative management tools on the efficiency of housing and communal services (HCS). The methodological framework includes a review of international and national case studies, expert interviews, and comparative statistical analysis to ensure a comprehensive evaluation of current practices and future potential.

ANALYSIS AND RESULTS

The housing and communal services sector is considered a conservative and technology-resistant industry characterized by substantial underfunding, which results in numerous technological issues. Among these are the significant physical and moral depreciation of core housing infrastructure assets, outdated technologies in the operation of utility networks, and inefficient technological solutions and schemes for providing communal services.

Significant challenges in this sector arise during the transition to energy-efficient technologies. In Uzbekistan, approximately 70% of the country's total energy-saving potential is concentrated specifically within the housing and communal services sector, with the energy intensity of this industry exceeding the average indicators of countries with similar climatic conditions by more than four times. Even widely used energy-saving technologies in residential sectors, such as energy-efficient lighting, motion and illumination sensors, and resource metering devices, are rarely implemented by management organizations. Conducting energy audits in residential

buildings is an expensive measure, and it remains challenging to communicate the feasibility of these costs to the population.

Technological issues also include challenges related to digitalization within the housing and communal services sector. Although numerous advanced digital solutions exist today, the mechanisms for implementing digitalization in housing and communal services—both legal and economic—remain insufficiently developed. Additionally, the high costs associated with digital transformation pose significant obstacles for small management companies and single-building homeowners' associations. Nevertheless, digital innovations represent the future, underscoring the need for relationship marketing initiatives aimed at actively engaging the population in widespread adoption of smart digital technologies.

A major barrier to the introduction of smart technologies is the entrenched negative perception among consumers toward housing and communal services, dissatisfaction with the quality of services provided, and a low level of engagement in sectoral development. According to social surveys, the most common forms of public participation in housing and communal reforms include installing individual meters for cold and hot water supply (74%), energy-saving lamps (75%), and participating in landscaping the areas surrounding residential buildings (24%). Conversely, citizen involvement remains extremely low regarding critical decisions such as selecting the method for accumulating building renovation funds (13%), choosing a management company or electing a house council (7% each), establishing homeowners' associations or management companies (3%), and monitoring management company activities (4%). Overall satisfaction with housing and communal services across Uzbekistan is relatively low, with 19% of respondents believing that the sector's situation is deteriorating [5].

The established practices in managing apartment buildings highlight a number of managerial and marketing issues that constitute significant barriers to effective consumer communication (Table 1).

Table 1

Key relationship marketing problems of management companies with housing and communal service consumers

Organizational-Managerial Problems	Marketing Problems
<ul style="list-style-type: none"> ▪ Low quality of housing and communal services provided to the population amid rising costs ▪ Shortage of qualified sectoral professionals ▪ Absence of a well-established system of effective communication among market participants ▪ High passivity, low legal literacy, and weak involvement of citizens in the management of multi-apartment buildings ▪ Lack of psychological readiness among the population to accept personal responsibility as private homeowners for maintaining residential property 	<ul style="list-style-type: none"> ▪ Complete lack of relationship marketing tools in the practice of management companies in the housing sector ▪ Lack of qualified marketing specialists in the sector, as higher education institutions do not adequately train such professionals ▪ Absence of consumer marketing research and thus weak understanding of the needs of the population as a target audience ▪ Negative image of management companies/homeowners' associations (MC/HOA) in the eyes of the public

The presence of these problems contributes to difficulties in interactions with consumers of housing and communal services, public mistrust towards service providers, the perpetuation of negative stereotypes regarding the industry as a whole, and social conflicts. Therefore, it is particularly relevant to integrate relationship marketing strategies into the operations of management organizations.

Relationship marketing today represents the latest stage in the evolutionary development of

marketing, transitioning from the concept of satisfying consumer needs through one-time transactional exchanges to the concept of long-term, mutually beneficial relationships with consumers involving all relevant stakeholders. According to the new marketing paradigm, clients are regarded as full-fledged stakeholders in the value creation chain and as a key source of the firm's competitive advantage.

The specific feature of the strategic planning system in relationship marketing lies in the fact that the object is not the product portfolio, but rather the client portfolio of the company. The analysis of consumers and their preferences serves as the foundation for developing relationship marketing strategies for management organizations operating in the housing and utilities market [6].

Given that the housing and utilities market is characterized by the collective consumption of housing services, the group consumer is, accordingly, a specific multi-apartment building (hereinafter – MAB). The segmentation of such collective consumers varies across different management companies.

For instance, in the case of a management company responsible for a large number of buildings (which is most often the case in practice), it is possible to conduct segmentation based on the specific characteristics of the housing stock. This allows for differentiated relationship marketing strategies for each segment.

The following segmentation criteria may be proposed:

- the age of the MAB (older buildings vs. new developments – as practice shows, different buildings tend to have different consumer demographics);
- the degree of wear and tear of engineering systems (high deterioration is closely associated with a larger number of accidents in in-building networks, increased social tension due to residents' dissatisfaction, and high maintenance and current repair costs);
- the technical condition of the building and the surrounding area;
- the comfort level of the housing (economy, comfort, or premium-class housing);
- the market value of residential units in the given MAB;
- the level of resident engagement (presence of a building council, floor/entrance representatives, etc.).

All relationship marketing variables—as well as the specific list of smart technologies developed by management companies and proposed for approval by general homeowners' meetings (hereinafter – GHMs)—are directly influenced by the above parameters. Naturally, older MABs are more costly for both management companies and residents when it comes to implementing smart innovations [7].

In the case of homeowners' associations (HOAs) managing a single building, segmentation based on housing stock characteristics is not feasible. Therefore, relationship marketing must be built around a single collective consumer unit.

Nevertheless, regardless of the number of MABs under management, each managing organization, including HOAs, should regularly conduct consumer research to identify resident needs and expectations. This can be achieved through verbal interviews, questionnaires, observation of homeowners' behavior, analysis of discussions at GHMs, and evaluation of resident service requests. A high level of satisfaction with housing and communal services (HCS) can only be achieved when the managing organization fully understands the actual needs of its consumers.

To this end, it is advisable to apply a version of Maslow's Hierarchy of Needs, adapted to the specifics of the HCS market, when developing a strategic plan for implementing smart technologies [8].

According to our hypothesis, housing and communal services can satisfy all levels of human needs. Consequently, their development and the integration of smart technologies can and should be implemented progressively—from addressing basic needs to fulfilling higher-order aspirations (see Fig. 1).

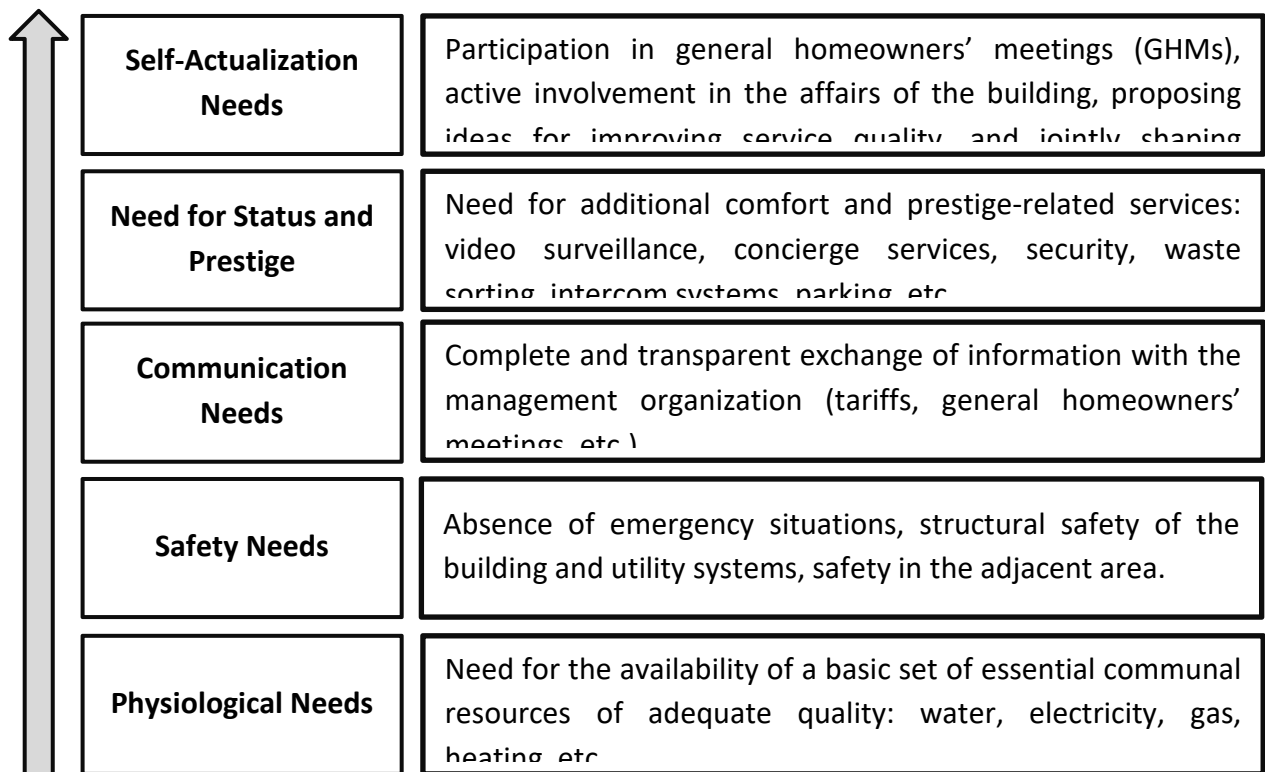


Figure 1. Hierarchy of Needs of Housing and Communal Services (HCS) Consumers

Level one— ensuring human survival in the home, meeting basic physiological needs. When purchasing and consuming housing and communal services, the consumer is primarily driven by utilitarian motives—the desire or intent to obtain a sufficient or minimally necessary amount of services at an affordable cost to satisfy basic physiological needs. Smart technologies appropriate at this level include energy-saving solutions aimed at reducing HCS costs, such as: individual meters for water, gas, and electricity (including remote data transmission technologies), automated heating control systems with atmospheric sensors, energy-efficient lighting systems, motion, sound, and light sensors, etc.

Second Level – Safety Needs. Today, residents harbor numerous concerns about potential hazards such as accidents, flooding, falling icicles, and ice accumulation. Ensuring safety is one of the key responsibilities of management organizations, along with the provision of high-quality housing and communal services. At this level, the management organization may propose the implementation of emergency shutoff systems for communal resources, including water leakage sensors, gas detectors, and smoke alarms.

Third Level (according to A. Maslow) – Communication Needs. In this context, relationship marketing by management companies and homeowners' associations (HOAs) is most effectively expressed through ensuring full transparency in information exchange with residents. Full access must be provided to information about the management company, emergency dispatch services, contact numbers of personnel, working hours, utility tariffs, reports on completed work, planned maintenance, and more. Smart technologies aligned with this level of need include an interactive website for the management organization, social media platforms, mobile applications, and messaging services.

Fourth Level – Need for Social Status and Recognition. This level pertains to lifestyle, status, and public esteem. In the context of the housing and utilities sector, this level corresponds to the purchase of “comfort” and “premium” class real estate. While older residential buildings cannot be transformed into luxury housing, it is possible to significantly enhance the physical condition of the building and surrounding area to approximate the comfort level as much as possible. Here,

it is appropriate to speak about the expansion of the service offering by the management company (in agreement with residents), moving from a basic standard service package to additional services and smart technologies such as video surveillance, video intercoms, security services, concierges, fenced areas, parking lots, barrier gates, fountains, automated irrigation systems, etc.

Fifth Level – Self-Actualization Needs. At this level, the individual is focused not on the consumption of goods or services, but on personal growth, the pursuit of a mission, and the realization of inner potential. In terms of housing and communal services consumers, this can be interpreted as active partnership in managing the residential building as a shared asset among all stakeholders. Residents at this stage are aware of their responsibility and are willing to share their positive experiences and values with other consumers. In this context, the same digital communication tools—websites, social media, mobile applications, and messaging platforms—remain highly relevant.

As illustrated in Figure 2, the satisfaction of each successive, higher-order need is accompanied by an increase in both residents' trust and their level of engagement in shaping more advanced housing and communal services (HCS). This reflects Maslow's own assertion: transition to the next level is only possible upon the full satisfaction of the preceding one. Clearly, it is impractical to offer residents of multi-apartment buildings mobile applications for improved communication if the building's utility systems are in an emergency state. Thus, the model presented serves as a strategic framework for building relationship marketing by the management organization, where the ultimate goal (or vision for the future) is to satisfy, including through the implementation of smart technologies, the fifth-level needs—when homeowners perceive themselves as full partners and, together with the management company or homeowners' association (HOA), co-create long-term and effective relationships.

To achieve this goal, a sequential approach is required (in accordance with the proposed hierarchy of needs), involving the resolution of the following tasks:

1. Improvement of service quality – ensuring the provision of benchmark-level housing and communal services.
2. Reduction in emergency incidents and the associated costs of their resolution.
3. Implementation of joint energy-saving measures with residents over the next 3–5 years (such as insulation of the building and roof, installation of energy-efficient windows in entrances, deployment of smart engineering control systems).
4. Enhancement of communication efficiency with residents and partners, ensuring transparent and accessible information exchange.
5. Modernization and improvement of shared property characteristics to increase residential comfort. These measures are to be implemented through effective use of capital repair funds (e.g., from a special house renovation account), based on the joint selection with homeowners of the scope of work (including the introduction of smart technologies) and contractors.

At the tactical planning level, this strategy involves a set of actions, marketing technologies, and tools necessary for the management organization to realize its strategic objectives and improve partnership relations with consumers.

A classical framework for consumer interaction is Jerome McCarthy's 4P marketing mix, later popularized by Philip Kotler: Product, Price, Place (distribution channels), Promotion.

In the services sector, it is common to extend the model to include a fifth, sixth, and seventh "P": People (staff and human resources), Process (service delivery processes), Physical evidence (the physical environment in which the service is provided). Although the use of these additional components remains a subject of debate, these elements represent controllable organizational variables, and serve as key tactical marketing instruments.

In the context of the above-mentioned transformation of markets into buyer-driven markets, the traditional 4P model and its variations have been losing their effectiveness due to significant changes in consumer behavior. In 1990, Robert F. Lauterborn proposed a new marketing

concept—the 4C model, which shifted the marketing focus from the company's product to the consumer [10]. The elements of the 4C model are as follows:

1. Customer Needs and Wants – a deep understanding of what the consumer truly requires.
2. Cost – not just the price, but the total cost incurred by the consumer (monetary, time, effort).
3. Convenience – how easily and comfortably the consumer can obtain the product or service.
4. Communication – a two-way, interactive process replacing traditional one-way promotion.

For the effective implementation of smart technologies in the housing and utilities sector, it is essential to adopt a hybrid 4P–4C model, as relationship marketing presumes mutual value creation and reciprocal benefit between providers and consumers. It is important to note that in the relationship marketing paradigm, greater emphasis is placed on the communication component than in traditional marketing theory. The foundation of tactical communication planning with target consumer groups includes:

- A quantitative and qualitative assessment of target segments (understanding their needs, expectations, purchasing power, etc.);
- The structure and content of communication messages;
- The selection of low-cost communication channels and resource allocation within the management organization.

Since all expenses, including advertising and communication costs, must be incorporated into the annual budget and approved by the residents, significant spending on communication campaigns is practically unfeasible. Therefore, management organizations face a complex task: identifying cost-effective, low-budget platforms for engaging with consumers.

This necessitates innovative approaches to outreach, such as:

- Using messenger apps, local social media groups, or community chat platforms;
- Maintaining interactive websites or mobile apps;
- Organizing informal meetings, surveys, or open-door sessions to foster dialogue and trust without major expenditures.

In conclusion, the integration of the 4P and 4C models, along with a strong focus on cost-effective communications, forms the backbone of a sustainable and responsive marketing strategy for management organizations in the digital era of housing and communal services.

CONCLUSION

The housing and communal services (HCS) sector is widely regarded as a conservative industry, resistant to new technologies and marked by significant technological lag and chronic underfunding. The effectiveness of smart technology development in the HCS domain is entirely determined by consumer demands and preferences, their level of satisfaction, and degree of involvement in the sector's evolution. At the same time, the selection, financing, and implementation of smart technologies in the management of multi-apartment buildings are de jure impossible without prior approval by residents at general homeowners' meetings.

Therefore, the advancement of smart technologies in the HCS market can only proceed through the integration of modern relationship marketing tools into the operations of management organizations. This requires identifying residents' current needs and designing tailored smart technology solutions that align with the expectations and values of specific target groups. Strategically embedding relationship marketing into the framework of housing management not only improves trust and transparency but also creates a sustainable foundation for the digital transformation of the sector, where consumers act as partners in value co-creation.

REFERENCES

1. Ravshan, N., Khurshidjon, K. (2024). Improving the Efficiency of Housing Stock Management in the Context of Digitalization. In: Koucheryavy, Y., Aziz, A. (eds) Internet of Things, Smart Spaces, and Next Generation Networks and Systems. NEW2AN ruSMART 2023. Lecture Notes in Computer Science, vol 14543. Springer, Cham. https://doi.org/10.1007/978-3-031-60997-8_19

2. Burgelman, R. A., Christensen, C. M., & Wheelwright, S. C. (2004). Strategic management of technology and innovation (4th ed.). McGraw-Hill.
3. Porter, M. E. (2008). Competitive strategy: Techniques for analyzing industries and competitors. Free Press.
4. Hines, P., & Taylor, D. (2015). The Lean IT field guide: A roadmap for your transformation. CRC Press.
5. Nurimbetov, R. I., & Kakhramonov, K. S. (2022). Perspectives on the development of the management system for multi-apartment housing stock in the Republic of Uzbekistan. *Housing Strategies*, 9(3), 309–326.
6. Koval, S. P. (n.d.). Energy saving in housing and utilities: 96 methods. Retrieved December 20, 2019, from <http://portal-energo.ru/articles/details/id/40>
7. Nurimbetov, R. I. (2023). Analysis of factors affecting the efficiency of housing stock management. In *Investments, Urban Planning, and Real Estate as Drivers of Socio-Economic Development and Quality of Life* (pp. 115–118).
8. Maslow, A. H. (2012). *Motivation and personality* (3rd ed., Trans. from English). Saint Petersburg: Piter.
9. Kotler, P., & Keller, K. L. (2012). *Marketing management* (12th ed.). Saint Petersburg: Piter.
10. Tultaev, T. A., & Tultaeva, I. V. (2014). 5P, 7P, 4C: Key concepts of the marketing mix. Moscow State University of Economics, Statistics and Informatics (MESI), Report No. 625-NIR/2014.