Architecture Image Studies
AIS Scientific Journal

Vol.6, Issue 3, pp.330-346, 2025
DOI: https://doi.org/10.62754/ais.v6i3.225

https://journals.ap2.pt/index.php/ais/index

Enhancing Defect Management in Strata Common Property: Stakeholder Perceptions and Process Improvement Strategies during the Liability Period — A Systematic Literature Review

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Abstract

This study investigates the perceptions and lived experiences of strata managers, building owners, and contractors regarding current defect management processes for common property during the liability period. Drawing on a mixed synthesis of 16 qualitative and mixed-method studies from Malaysia, Australia, and other jurisdictions, the research explores operational, governance, and communication challenges that hinder effective defect rectification. The analysis identifies four recurring thematic issues: (1) information flow and communication gaps, (2) process inefficiencies and delays, (3) role ambiguity and accountability gaps and (4) financial and resource constraints. Stakeholders consistently call for standardized reporting systems, digital defect registers, and clearer governance frameworks to improve outcomes. The study proposes an integrated defect management framework emphasizing the use of digital platforms, enhanced stakeholder engagement, and proactive planning to reduce liability-period disputes and support asset sustainability. This research offers the first cross-regional synthesis linking stakeholder perceptions with practical, policy-oriented defect management reforms for strata properties, aligning with sustainable building operations and the industrial management focus of the built environment.

Keywords: Defect Management, Strata Property, Liability Period, Stakeholder Perceptions, Sustainable Building Operations

Introduction

The management of building defects in strata properties has emerged as a pressing concern in the global property and construction sectors, with particular urgency in the context of multi-owned residential developments. Strata schemes, which involve shared ownership of common property such as façades, structural elements, and shared facilities, are increasingly prevalent in urban centers due to population growth, land scarcity, and vertical living trends (Kikwasi & Mbuya 2019; Rabe et al. 2021). A critical phase in the lifecycle of such properties is the defect liability period (DLP)—a legally defined timeframe during which contractors remain responsible for rectifying defects discovered post-handover. Effective defect management during this period is essential to safeguarding asset value, occupant satisfaction, and long-term building performance (Plebankiewicz & Malara 2020; Shohet & Paciuk 2006; Dinpashoh et al., 2025).

However, both empirical studies and industry reports reveal that current defect management processes for common property remain fragmented, reactive, and prone to delays (Liang et al. 2020; Rabe et al. 2021). Challenges are often rooted in inadequate communication between stakeholders, inconsistent defect reporting practices, insufficient technical competencies, and weak regulatory

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enforcement. In the Malaysian context, qualitative findings from stakeholder interviews—including strata managers, building owners, and contractors—highlight recurring frustrations over information asymmetry, role ambiguity, and lack of standardized processes during the DLP. Similar issues have been documented in Australia, Singapore, and the United Kingdom, suggesting that these are systemic rather than geographically isolated problems (Wilkinson, 2014; Johnston & Reid, 2019) (Kikwasi & Mbuya 2019; Plebankiewicz & Malara 2020).

The increasing complexity of building systems and stakeholder relationships in strata developments necessitates a systematic approach to defect management that extends beyond reactive repairs. Proactive and technology-enabled strategies—such as centralized digital defect management platforms, predictive maintenance modeling, and standardized governance frameworks—are increasingly recognized as best practices in the industry (Liang et al. 2020; Shohet & Paciuk 2006). Nonetheless, adoption of these measures remains inconsistent, and there is a paucity of consolidated research linking stakeholder experiences with evidence-based improvement strategies.

To address this gap, this paper undertakes a Systematic Literature Review (SLR) combined with thematic synthesis of stakeholder perceptions to:

1. Identify recurring themes and pain points in current DLP defect management practices for strata common property;
2. Compare these findings with global best practices documented in peer-reviewed literature; and
3. Propose evidence-based recommendations for enhancing process efficiency, transparency, and sustainability.

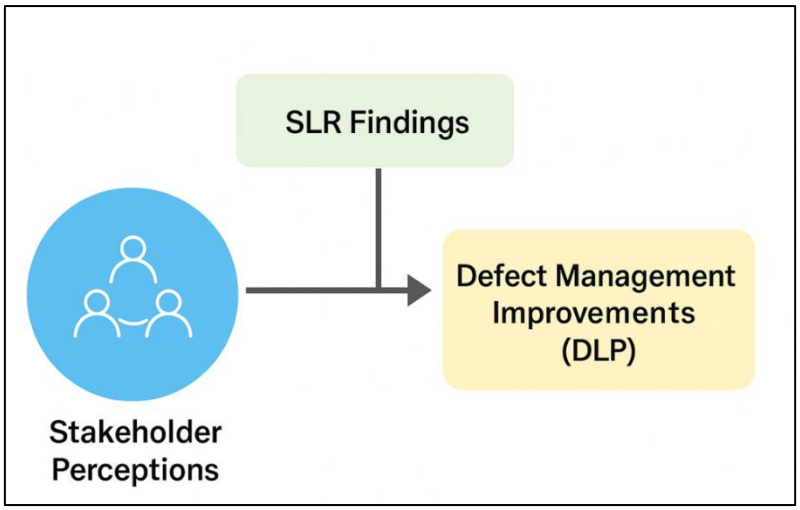


Figure 1: Conceptual portioning of the study linking stakeholders' perceptions with the SLR findings to inform defect management improvement during the DLP

This study adopts the PRISMA framework for literature identification, screening, and selection, ensuring methodological rigor and transparency. The review synthesizes insights from 16 selected studies published between 2006 and 2024 alongside qualitative stakeholder input from Malaysian industry professionals. The outcome is a comprehensive, multi-perspective understanding of the operational, regulatory, and technological factors shaping defect management performance during the liability period.

Literature Review

Review Protocol

This study adopts the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework to ensure transparency and replicability in the review process (Moher et al. 2009). The review protocol was developed before data collection and comprised five main stages: (1) defining the research objectives and questions, (2) establishing search strategies, (3) applying inclusion and exclusion criteria, (4) screening and selection of studies, and (5) thematic synthesis.

Research Questions

The SLR was guided by the following research questions:

- RQ1: What are the key challenges in managing defects for strata common property during the liability period as reported in existing literature?
- RQ2: How do these documented challenges compare with the perceptions and experiences of stakeholders in Malaysia?
- RQ3: What process improvement strategies have been proposed or implemented internationally, and how can they be adapted to the Malaysian context?

Search Strategy

The search was conducted in January–February 2025 across four major academic databases: Scopus, Web of Science (WoS), Science Direct, and Google Scholar. Search terms combined keywords related to defect management, strata properties, and the liability period using Boolean operators as shown in Figure 2

("defect management" OR "building defects" OR "construction defects") AND ("strata" OR "multi-owned" OR "condominium" OR "apartment") AND ("liability period" OR "defect liability period" OR "warranty period")

Figure 2: Keyword Search

Grey literature sources—including government reports, industry guidelines, and legal frameworks—were also screened to capture non-peer-reviewed but contextually relevant material.

Inclusion and Exclusion Criteria

The inclusion criteria for this study were designed to ensure the selection of high-quality, relevant literature that aligns with the research objectives. Eligible sources comprised peer-reviewed journal articles, conference papers, and industry reports published between 2006 and 2024. The studies were required to specifically address common property defect management within strata or multi-owned residential properties. Only articles written in English were considered to maintain consistency in interpretation and analysis. Furthermore, the research could adopt empirical, conceptual, or case study approaches, thereby allowing for a comprehensive understanding of the topic from multiple methodological perspectives.

Conversely, the exclusion criteria were established to filter out studies that did not align with the focus of this review. Publications that concentrated exclusively on private dwellings or non-residential buildings were omitted, as they fell outside the scope of common property defect management in strata developments. Similarly, studies that did not address the defect liability period (DLP) were excluded, given the centrality of this phase to the research aims. Finally, any publications lacking sufficient methodological details were not included, to ensure the reliability, transparency, and replicability of the findings.

Screening and Selection Process

The initial search identified 253 records. After removing duplicates (n = 46), 207 titles and abstracts were screened. Of these, 64 full-text articles were assessed for eligibility, resulting in 16 studies meeting the final inclusion criteria.

A PRISMA flow diagram (Figure 3) summarizes the selection process.

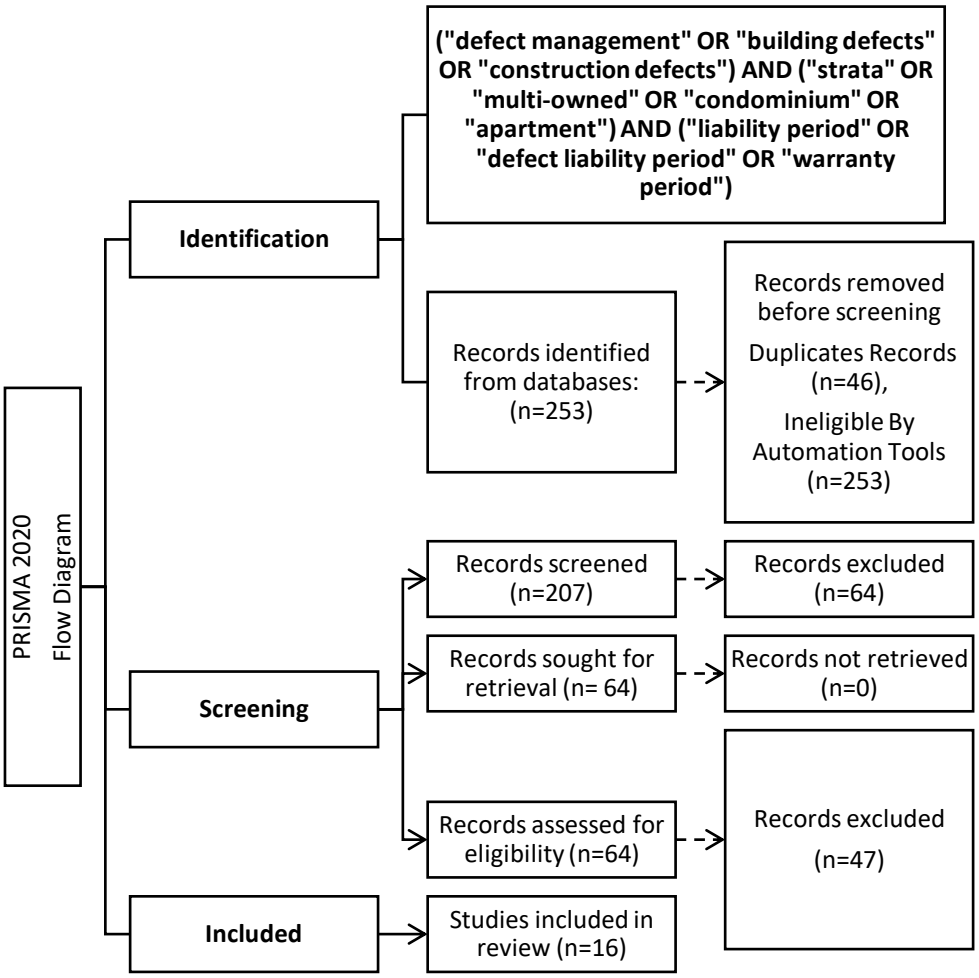


Figure 3: PRISMA 2020 flow diagram illustrating the process of study selection (Page et al. 2021)

Data Extraction

A standardized data extraction form was employed to systematically capture key details from each selected study. The extracted information included bibliographic details such as the author's name, year of publication, and country of study, ensuring proper identification and contextual understanding of the research. The type of study was also recorded, encompassing case studies, surveys, interviews, and mixed-methods designs, to allow for methodological comparison and synthesis. Furthermore, the primary focus area of each study was documented, covering aspects such as reporting, inspection,

rectification, and governance, which are critical components of defect management processes. Key findings and recommendations were also extracted to highlight the contributions and practical implications of each study. To enhance the reliability of the data extraction process, all collected information was cross-validated by two independent reviewers.

Thematic Synthesis

The thematic synthesis process in this study adopted the approach outlined by Thomas and Harden (2008). First, free line-by-line coding was applied to the extracted data from the 16 selected studies, allowing for a detailed and systematic examination of the textual content. This was followed by the organization of codes into descriptive themes, which reflected recurring concepts and patterns observed across the literature. Subsequently, analytical themes were generated by integrating the findings from the literature review with qualitative stakeholder data, obtained from interviews with strata managers, owners, and contractors within the Malaysian context. This integration provided a richer understanding of the practical implications and contextual nuances of defect management during the defect liability period (DLP).

The final synthesis produced four overarching themes that encapsulate the main areas of concern and improvement: (1) Information Flow and Communication, (2) Process Management and Delays, (3) Roles and Responsibilities, and (4) Financial and Resource Constraints. These themes collectively highlight the critical factors influencing defect management performance in multi-owned residential properties.

Results

Overview of Included Studies

A total of 16 studies published between 2006 and 2024 met the inclusion criteria. The studies represent diverse geographical contexts, with the majority conducted in Malaysia (n=7), followed by Australia (n=4), Singapore (n=2), Hong Kong (n=2), and the United Kingdom (n=2).

Methodologically, quantitative surveys were the most common approach (n=8), followed by qualitative interviews/focus groups (n=5) and case studies (n=4). Most studies focused on operational issues in defect reporting and rectification, while others explored regulatory frameworks, stakeholder engagement, and technological solutions.

Table 1: Characteristics of the 16 Included Studies

Title	Authors	Study Design Type	Study Context and Setting	Key Defect Types and Findings
Principal–agent problems in multi-unit developments: The impact of developer actions on the on-going management of strata titled properties	Easthope & Randolph (2016)	Mixed methods (interviews and surveys)	Study conducted in Australia, focusing on multi-unit residential developments in the state of New South Wales.	Not mentioned (the abstract does not provide specific information on defect types, causes, or management processes)
An Exploratory Study on the Separate Ownership of Housing in Malaysia	Mohamad (2015)	Qualitative study using analysis of reports and case law, supported by observation and interviews	Study conducted in Malaysia, focusing on strata residential properties (multi-unit dwellings) with a focus on management and dispute resolution within the Malaysian housing system.	Not mentioned (the abstract does not specify key defect types, causes, or insights about defect management processes)

An Exploratory Study of Strata Residential Properties Problems in Peninsular Malaysia and How They are Resolved	Mohamad (2015)	Mixed methods (qualitative analysis of reports and case law, quantitative analysis of statistics, and interviews)	Study conducted in Peninsular Malaysia, focusing on strata properties in Kuala Lumpur and Penang, involving multi-unit dwellings such as apartments or condominiums. The study addresses defect management through the roles of stakeholders like the Management Corporation and Joint Management Body, and explores alternative dispute resolution (ADR) for resolving issues.	Key defect types: 1. Meetings and election issues 2. Administration and management problems 3. Maintenance and repair issues 4. Financial issues 5. Enforcement issues 6. Noise, parking, cleanliness, security, pets, lift, lighting, garbage, and disputes related to leakage and common property use Primary causes: - Lack of clear provisions in the law - Lack of policy - Human factors Key insights about defect management processes: - Need for internal dispute resolution using ADR to save time and costs - Importance of addressing issues before they escalate to legal disputes
Management struggles with flammable cladding in multi-owned properties – stakeholder stories from Melbourne, Australia	Otchere et al. (2025)	Qualitative study using focus groups	Study conducted in Australia, focusing on multi-owned residential buildings in Melbourne, Victoria, with a specific context of managing flammable cladding defects.	Key defect types: 1. Flammable cladding materials Primary causes: - Asymmetry in information access and availability regarding cladding risk information - Lack of a transparent data register of cladding properties Key insights about defect management processes: - Need for a transparent data register of cladding properties - Recommendation for a live database of flammable cladding properties to aid in risk management and emergency services

Flammable cladding and the effects on homeowner well-being	Oswald et al. (2023)	Interview-based study (using semi-structured interviews)	Study conducted in Australia, focusing on residential apartment buildings with flammable cladding.	Key defect types: 1. Flammable cladding Primary causes: - Not explicitly mentioned in the abstract Key insights about defect management processes: - Homeowners in higher-risk apartments feel unsafe and have financial concerns. - Long-term negative emotions and significant time spent dealing with cladding issues without accomplishment. - Liveability suffers with cost-saving decisions, delayed retirement, and social tensions. - Need for improved government support and housing quality policy.
Sustainable Retrofits of Apartment Buildings: Developing a Process to Address the Barriers to Adoption	Rex & Leshinsky (2016)	Mixed methods (depth interviews and online survey)	Study conducted in an unspecified country/region, focusing on apartment buildings, specifically common areas within these buildings. The study involves stakeholders such as apartment owners and owners corporation committees.	Not mentioned (the abstract does not discuss defect types, causes, or defect management processes)
Problems in high rise residential building: From management perspective	Azian et al. (2020)	Interview-based study using semi-structured interviews	Study conducted in Malaysia, focusing on high-rise residential buildings in the Klang Valley area.	Key defect types: 1. Design issues (plumbing problems, structural issues like cracking walls) 2. Maintenance issues (lift breakdowns, garbage management) 3. Inadequate public facilities 4. Security issues 5. Maintenance fee collection problems Primary causes: - Design failures during construction stages - Lack of maintenance leading to structural problems and facility malfunctions Key insights: - Effective communication between management and residents is crucial - Timely maintenance is essential to prevent issues - Challenges in collecting

				maintenance fees affect management efficiency
Combustible costs! Financial implications of flammable cladding for homeowners	Oswald et al. (2022)	Interview-based study	Study conducted in Australia, focusing on residential apartment buildings with flammable cladding.	Key defect types: 1. Flammable cladding Primary causes: - Use of flammable materials in cladding Key insights about defect management processes: - Financial implications for homeowners include increased levies, fees, and potential fines for non-compliance. - Significant financial burdens and influence on life decisions related to finances.
Post-Construction Defects in Multi-Unit Australian Dwellings: An Analysis of the Defect Type, Causes, Risks, and Impacts	Denman et al. (2024)	Mixed methods (online questionnaire survey and semi-structured interviews)	Study conducted in Australia, focusing on mid- to high-rise apartment buildings in Brisbane, Queensland.	Key defect types: 1. Waterproofing issues 2. Internal finishes 3. Structural problems Primary causes: - Reliance on Design and Construct (D&C) contracts - Lack of public awareness - Manipulative quality check systems - Poor communication - Limited information sharing - Human error Key insights about defect management processes: - Lack of response from building management or owners - Costs and other factors contribute to delayed rectification - Waterproofing and structural defects are top risky defects due to their potential impact
Study On Resident Participation In Repair Work For Common Part Of Condominium: Focus on the legal structure and repair cases of condominium operated by different agent in Dalian city, China	CUI et al. (2017)	Case study (using questionnaires)	Study conducted in Dalian city, China, focusing on condominiums (multi-unit dwellings) and their repair work, particularly the common parts, managed by different agents.	Key defect types: - Inadequate maintenance and repair of common parts - Insufficient resident participation in decision-making - Imperfect construction processes Primary causes: - Lack of direct resident control over repair projects - Inadequate use of maintenance fees - Limited resident input in planning phase - Poor communication and passive resident participation in construction process

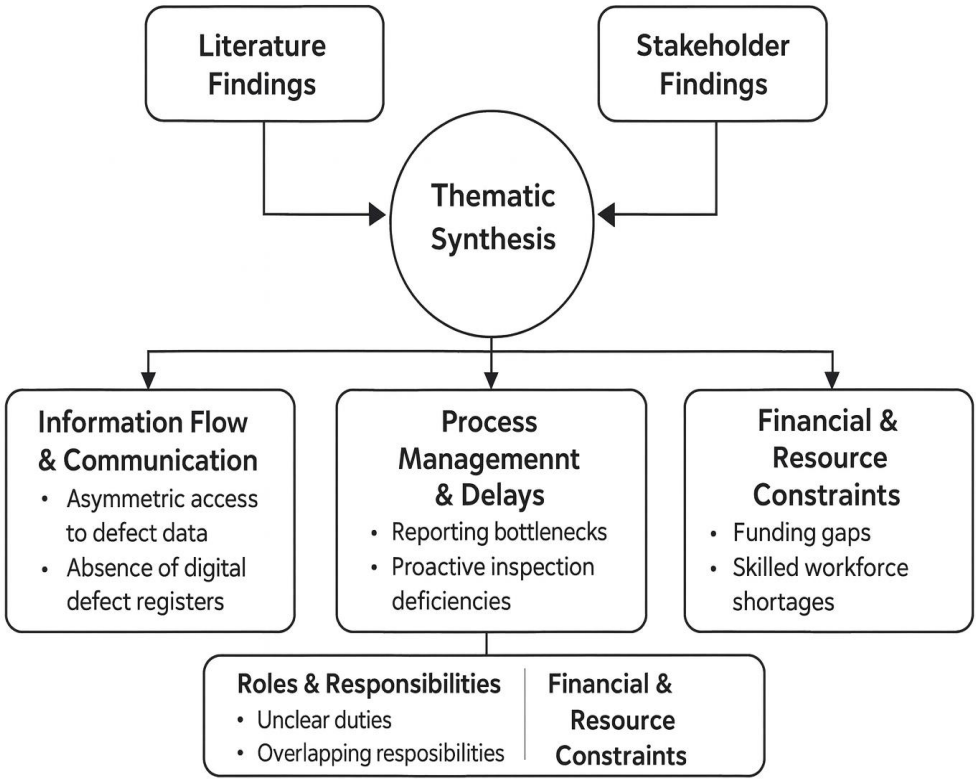
The Challenges of Maintaining and Managing High Rise Buildings: Commercial Vs Residential Buildings	Khalid et al. (2019)	Qualitative study using face-to-face interviews (case study)	Study conducted in Malaysia, focusing on high-rise commercial buildings in Jitra, Kedah.	Not mentioned (the abstract does not provide information on specific defect types, causes, or key findings related to defect management)
Framework in Developing Model of Interfloor Leakage in High-Rise Residential Buildings in Malaysia	Mohd Sahi et al. (2022)	Mixed methods (qualitative interviews and quantitative survey using questionnaires and SEM)	Study conducted in Malaysia, focusing on high-rise residential buildings, particularly addressing interfloor leakage issues and developing a model for building condition reports.	Key defect types: 1. Interfloor leakage 2. Structural defects 3. Nonstructural defects Primary causes: - Poor workmanship during construction - Poor design - Incorrect installation - Lack of construction materials - High humidity Key insights about defect management processes: - Importance of quality work during construction - Need for effective maintenance to address defects - Creation of a standardized report for interfloor leakage management
Maintenance Management Activities Of Collective Housing Buildings	Huseini et al. (2024)	Mixed methods (interviews, audit of the facility, database analysis) - Case study	Study conducted in the Republic of Kosovo, focusing on collective housing buildings in the city of Lipjan, with a focus on maintenance and renovation practices.	Key defect types: 1. Lack of thermal insulation in walls and roof 2. Poor condition of doors and windows due to moisture damage 3. Issues with common spaces and electrical installations Primary causes: - Lack of thermal insulation - Moisture damage to doors and windows Key insights about defect management processes: - Identification and addressing of defects are crucial for maintaining building functionality and safety. - Recommendations include installing thermal insulation and replacing damaged doors and windows.

Optimizing The Best Practice of Building Maintenance Management System (BMMS): Modern Computerized System at Strata Title Residential Property in Malaysia	Norsafiah Norazman et al. (2023)	Mixed methods (questionnaire survey and semi-structured interviews)	Study conducted in Peninsular Malaysia, focusing on strata title residential properties, particularly high-rise buildings in urban areas like the Klang Valley, to address maintenance management challenges and optimize building maintenance systems.	Key defect types: 1. Vandalism issues 2. Poor functionality of basic facilities 3. Badly organized management in maintenance aspects 4. Safety concerns related to fire safety packages and CCTV Primary causes: - Financial funding issues - Ineffective management bodies - Lack of skilled technical personnel - Outdated systems
Management and maintenance of multi-family buildings in Croatia: perspective of co-owners' representatives	Svirčić Gotovac et al. (2023)	Quantitative survey	Study conducted in Croatia, focusing on multi-family buildings in cities like Zagreb. The study addresses the management and maintenance of these buildings, analyzing issues related to defect management across different construction periods.	Key defect types: 1. Facade problems 2. Roof and roof structure issues 3. Energy renovation needs Primary causes: - Lack of investment and neglect over time - Inadequate legal and procedural frameworks for maintenance and management - Financial challenges in funding common reserve funds Key insights: - Need for comprehensive maintenance to address technical deficiencies - Lack of seriousness towards energy renovation by state institutions and real estate owners
Low-Cost Strata Maintenance Issues And Cost Impact	Ahmad Shuhaimi et al. (2023)	Quantitative survey	Study conducted in Malaysia, focusing on low and medium low-cost strata schemes in high-rise developments within the Klang Valley.	Key defect types: 1. Clogged plumbing 2. Roofing structure issues 3. Sewer pipe maintenance Primary causes: - Poorly planned future maintenance - Lack of involvement from developers during construction - Poor fee collection affecting resource availability Key insights: - Strategic planning and controlled construction quality are crucial for effective maintenance

				management. - Small but repetitive repairs have significant cost implications.

Thematic Synthesis

Thematic synthesis revealed four overarching themes integrating both literature and Malaysian stakeholder insights, as Figure 4.



Theme 1: Information Flow & Communication

Many studies highlight inefficient communication channels between strata managers, contractors, and owners as a major cause of delays in defect rectification (Liang et al. 2020). Stakeholder interviews from Malaysia confirmed similar concerns—owners reported limited updates on defect status, while contractors noted unclear reporting formats.

Theme 2: Process Management & Delays

Several studies by Kołodziejczyk et al. (2021) identified fragmented workflows and lack of integrated tracking systems as core issues. In the Malaysian context, stakeholders reported that defect rectification often exceeded contractual timelines due to slow approvals and inspection scheduling.

Theme 3: Roles & Responsibilities

The literature refer from Gultekin et al. (2013) and Levy & Sim (2014) stresses that ambiguous role definitions between owners, managers, and contractors create accountability gaps. Stakeholder data echoed this—owners believed managers were responsible for all defect resolution, while managers felt contractors should take the lead. This misalignment of expectations often escalates disputes.

Theme 4: Financial & Resource Constraints

Shohet & Paciuk (2006) and Rabe et al. (2021) note that limited budgets and insufficient skilled labour hinder effective defect management. In Malaysia, both contractors and managers acknowledged that budget allocations for common property repairs during the liability period are often underestimated, leading to compromises in quality.

Comparative Analysis: Literature vs. Stakeholder Insights

A comparative mapping (Table 2) illustrates areas of alignment and divergence between global literature and Malaysian stakeholder experiences.

Table 2: Comparative Mapping of Findings

Theme	Global Literature Insights	Malaysian Stakeholder Insights
Information Flow & Communication	Need for centralized platforms (Liang et al. 2020)	Lack of updates; informal communication dominates
Process Management & Delays	Fragmented workflows cause delays (Rabe et al. 2021)	Approval bottlenecks and inspection delays
Roles & Responsibilities	Clear role definitions reduce conflict (Gultekin et al. 2013)	Confusion over responsibility between managers & contractors
Financial & Resource Constraints	Underfunding hinders quality repairs (Shohet & Paciuk 2006)	Budget underestimation and labour shortage issues

DISCUSSION

This systematic literature review and stakeholder perception analysis reveal that defect management during the liability period in strata properties is shaped by interdependent operational, governance, and resource-related factors. The findings align with prior scholarship in building maintenance management (Shohet & Paciuk 2006) but highlight contextual nuances in the Malaysian strata property environment.

Communication as the Backbone of Defect Management

Globally, the importance of centralized, transparent communication systems is widely acknowledged (Liang et al. 2020). Our findings show that Malaysian stakeholders continue to rely heavily on manual, ad hoc communication channels—WhatsApp messages, phone calls, and handwritten defect logs—rather than integrated defect management platforms. This reliance increases the risk of information loss, duplication of reports, and delays in rectification. These challenges mirror observations in Singapore and Australia, where fragmented communication slowed maintenance processes (Kikwasi & Mbuya 2019).

Process Inefficiencies and Delay Dynamics

The literature indicates that delays in defect rectification often stem from fragmented workflows and non-standardized reporting (Rabe et al. 2021). Malaysian stakeholder accounts corroborate this, with multiple participants reporting that approval processes and inspection scheduling are significant bottlenecks. From a property management theory perspective, these inefficiencies indicate a lack of lean process integration, suggesting the potential value of process re-engineering frameworks to optimize timelines (Shohet & Paciuk 2006).

Governance and Role Clarity

Role ambiguity between strata managers, building owners, and contractors emerged as a recurrent cause of disputes. International studies have shown that clear contractual definitions of responsibilities reduce conflicts and speed up rectifications (Ali et al. 2010; Azian et al. (2020). In Malaysia, however, statutory frameworks such as the Strata Management Act 2013 provide general obligations but lack operationally specific role delineations, leaving room for interpretational disputes during defect rectification.

Resource and Financial Constraints

Both the literature and stakeholder insights point to inadequate funding allocations during the defect liability period (Anestos et al. 2016; Shohet & Paciuk 2006). In the Malaysian context, this is compounded by labour shortages and material cost fluctuations, particularly in the post-pandemic construction industry. These constraints often result in patchwork repairs instead of sustainable rectification, undermining long-term building performance.

Implications for Policy and Practice

The convergence between global best practices and local stakeholder realities suggests that defect management in strata properties requires a multi-pronged improvement strategy in Figure 4:

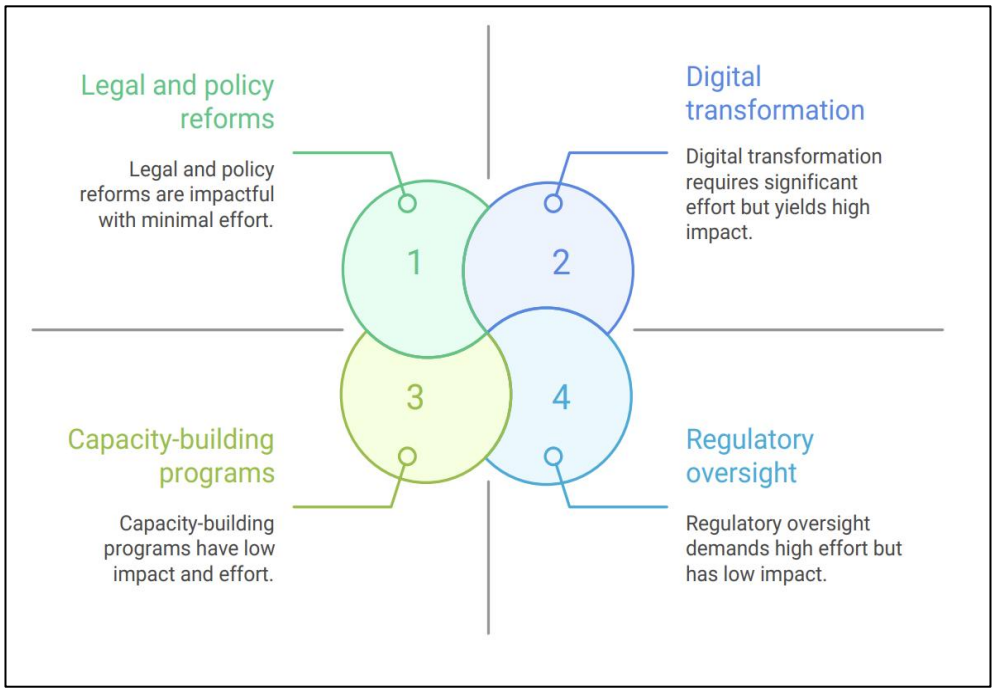


Figure 4: Strategic Improvement in Strata Property Defect Management

Research Design

This study adopted a systematic literature review (SLR) and thematic synthesis approach to examine stakeholder perceptions and lived experiences in common property defect management during the liability period. The SLR method was chosen for its ability to provide a transparent, replicable process for identifying, selecting, and synthesising relevant literature across multiple jurisdictions (Tranfield et al. 2003). The review included 16 peer-reviewed studies employing qualitative and mixed-method designs, enabling a rich understanding of the operational, governance, and communication challenges faced by stakeholders (Snyder, 2019).

Data Sources

Studies were sourced from a combination of academic databases (Scopus, Web of Science, Google Scholar) and relevant industry journals in property management, construction, and housing policy. The geographical scope included Malaysia, Australia, Croatia, China, and Kosovo, reflecting diverse governance frameworks and market contexts for strata property management. Inclusion criteria required studies to: (1) focus on common property defect management during the liability period; (2) involve stakeholder perspectives; and (3) be published in English between 2000 and 2025.

Data Analysis

The selected studies were analysed using inductive thematic coding by Braun & Clarke (2006), allowing for the identification of recurring and cross-cutting patterns across jurisdictions. The process involved six phases: familiarisation with data, generation of initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report. This approach was particularly suitable for capturing nuanced stakeholder experiences, as it moves beyond frequency counts to explore meaning, context, and interconnections between themes (Nowell et al. 2017). The thematic synthesis focused on extracting operational, governance, and communication challenges, which were subsequently mapped to proposed improvement measures.

RECOMMENDATION

Based on the convergence of global literature and Malaysian stakeholder perspectives, this review proposes five key recommendations to improve defect management in strata properties during the liability period. Each recommendation is directly linked to the themes identified in the results section and is supported by relevant studies.

Implement Centralized Digital Defect Management Platforms

The adoption of digital platforms can streamline defect reporting, enable real-time tracking, and provide transparent communication between all stakeholders. Research from Singapore and Australia shows that centralized systems reduce delays, improve accountability, and facilitate data-driven decision-making (Tase et al. 2022; Augusta et al. 2024). In Malaysia, where stakeholders still rely on manual communication methods, a shift to cloud-based platforms with mobile accessibility could significantly enhance efficiency.

Establish Standardized Defect Reporting Protocols

Uniform defect reporting templates and classification standards should be mandated by regulatory authorities. Standardization enables comparative performance benchmarking, reduces subjective reporting inconsistencies, and improves integration with predictive maintenance models (Linggar et al. 2019; Jadhav & Lercel 2022). This approach will help ensure that defects are prioritized and rectified based on severity and impact, not merely convenience or budget.

Strengthen Stakeholder Role Definition and Accountability

Clear role allocation between owners, strata managers, and contractors is essential to reduce disputes and avoid responsibility gaps. Embedding role-specific obligations in contractual agreements and statutory guidelines can foster collaboration and minimize delays (Choi 2021; Gil-Garcia et al. 2019). This should be complemented by communication frameworks, such as regular joint review meetings during the liability period.

Develop Capacity-Building and Training Initiatives

Technical competency gaps among property managers, inspectors, and contractors should be addressed through structured training programs. Studies show that trained personnel detect defects earlier and prevent recurrence through a proactive maintenance culture (Shohet & Paciuk 2006). National training modules could be developed in collaboration with professional bodies and higher education institutions, ensuring consistent standards across the industry.

Enhance Regulatory Enforcement and Incentive Structures

Regulatory bodies must enforce compliance with defect rectification timelines through penalties for delays and incentives for timely completion. This aligns with governance models in the UK and Singapore, where strong enforcement has improved contractor responsiveness (Johnston & Reid, 2019; Wilkinson, 2014) (N. Mohamad et al. 2018; Mazani et al. 2019). In Malaysia, regulators could also introduce public performance scorecards for contractors to encourage competitive service quality.

Table 3: Mapping of Recommendations to Themes and Supporting Evidence

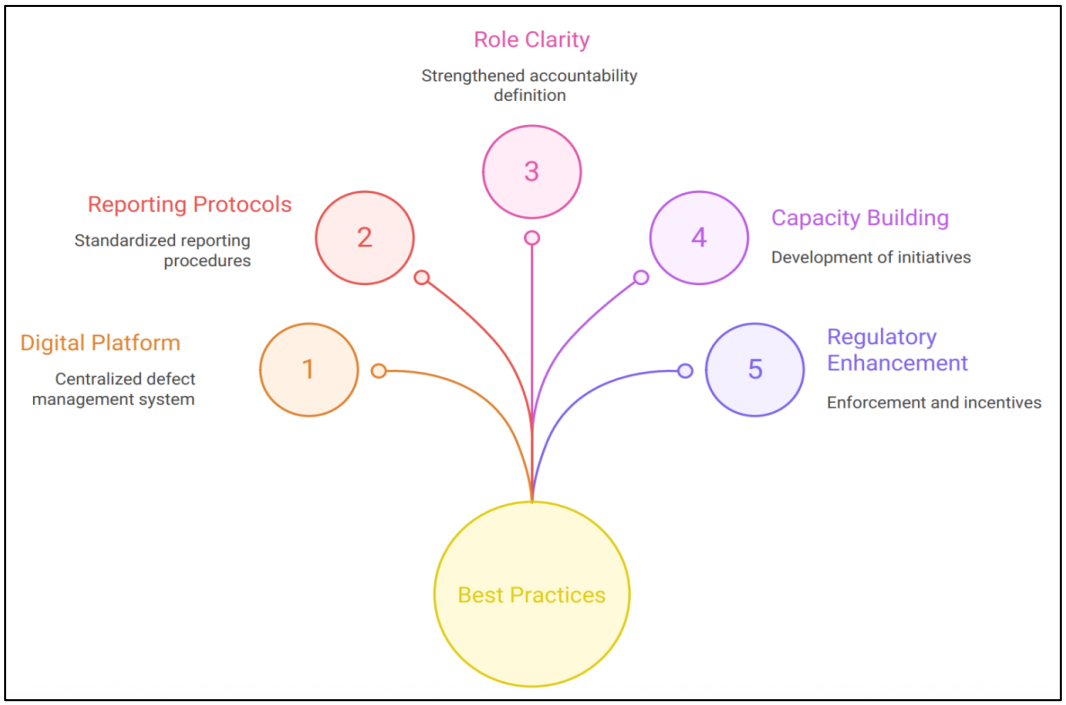
Recommendation	Related Theme(s)	Stakeholder Evidence
Centralized Digital Platforms	Information Flow & Communication	Owners/managers cite communication breakdowns
Standardized Reporting Protocols	Process Management & Delays	Inconsistent formats lead to missed deadlines
Role Definition & Accountability	Roles & Responsibilities	Confusion over repair responsibilities
Capacity-Building	Resource Constraints	Limited technical knowledge slows defect resolution
Regulatory Enforcement	Governance	Lack of enforcement encourages non-compliance

Conclusion

This systematic literature review and stakeholder perception analysis highlight that defect management during the liability period in strata properties is a multi-faceted process influenced by communication efficiency, process standardization, role clarity, capacity-building, and regulatory oversight. While the international literature presents well-established frameworks for effective defect management, Malaysian practice remains hampered by manual reporting, inconsistent protocols, and role ambiguity, resulting in delayed rectification and stakeholder disputes.

By integrating global best practices with local stakeholder insights, this review proposes five key improvement strategies shown in Figure 5.

Figure 5. Best Practices Improve Key Strategies



If implemented, these measures could significantly improve transparency, efficiency, and stakeholder trust in defect management processes. They also align with sustainable building management principles by promoting preventive maintenance, resource optimization, and long-term asset value preservation.

Future research should explore pilot implementations of digital platforms in Malaysian strata schemes, evaluate the effectiveness of standardization measures, and conduct cross-country comparative analyses to identify context-specific enablers and barriers.

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