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1. Community-based Facility Management in the Indonesian Context

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Abstract

Community-based Facility Management (CbFM) extends Facility Management beyond the organisational workplace by positioning communities as active participants in the planning, delivery, operation and maintenance of their shared built environment. Although the concept was introduced by Alexander and Brown, its implications for countries with strong traditions of collective action and multi-level community governance remain underexplored. This paper examines how CbFM can be understood and operationalised in the Indonesian context. It first positions CbFM in relation to conventional Facility Management and Urban Facility Management, emphasising its distinctive community-centred governance and public-value orientation. An integrative review of Facility Management literature, Indonesian policy and documented community-management practices is then used to examine how gotong royong, musyawarah-mufakat, swadaya, customary institutions and formal community organisations can contribute to the management of shared facilities and services. The analysis shows that these practices provide important foundations for collective mobilisation, local knowledge, deliberation and resource sharing, but do not by themselves ensure sustainable facility performance. Effective CbFM requires hybrid arrangements that connect community capacities with formal authority, technical competence, predictable financing and lifecycle responsibilities. The paper proposes an Indonesian CbFM framework structured around three interconnected elements: local routines of care and repair, hybrid governance and resource arrangements, and monitoring and institutional learning. These are operationalised through service standards, role clarity, maintenance cycles, differentiated funding, technical escalation and simple performance monitoring. The framework provides a basis for understanding and developing community-centred approaches to the long-term management of shared facilities in Indonesia.

2. Sustainability, Degrowth and Urban Resilience: Conceptualising Well-being in a Qualitative Study

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Abstract

This article examines the relationship between sustainability, degrowth and urban resilience and explores how these three dimensions are linked to urban well- being in residents' lived experiences. It starts from the premise that contemporary urban quality of life is shaped through the interplay between the normative orientation of sustainability, the sufficiency logic of degrowth and the operational capacity of resilience. Based on a review of the relevant literature, the article develops a conceptual model in which urban well-being is understood as the outcome of the interaction between these three axes, while digital overload is treated as a transversal contextual dimension of contemporary everyday life. The empirical part is based on a pilot qualitative study of eleven semi-structured interview cases, selected through a combination of convenience and purposive sampling and analysed using reflexive thematic analysis. The results show that interviewees understood sustainability primarily as the everyday liveability of space, degrowth as sufficiency and a reordering of priorities, and resilience as the practical capacity of space, institutions and communities to maintain basic functions under everyday and crisis conditions. Digital overload appeared as an ambivalent accompanying dimension that shaped access, communication and the rhythm of everyday life, but did not replace the central sustainability-degrowth-resilience relationship. The article contributes an integrated interpretative framework for further research on urban well-being and highlights the need for broader, systematically field-collected qualitative studies.

Keywords: sustainability, degrowth, resilience, urban well-being, spatial justice, quality of life, qualitative analysis

3. Digital Anxiety and the Urban Living Environment

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Abstract

Digital connectivity has become embedded in work, communication, leisure and domestic routines, yet digital anxiety is still most often treated as an individual problem of technology use. This qualitative exploratory study examines digital anxiety as a socio-spatial phenomenon in the urban living environment. It asks how residents connect digital pressure with the characteristics of their dwelling and neighbourhood, and which spatial conditions they describe as intensifying or mitigating digital strain. Twenty semi-structured interviews were conducted in January and February 2026 with residents living in different urban housing situations, including smaller flats, family dwellings, rented units and homes with varying access to outdoor space. The material was analysed using reflexive thematic analysis. Three central patterns were identified in participants' accounts. First, digital anxiety was described less as excessive screen time than as continuous responsiveness and difficulty disconnecting. Second, the dwelling appeared as a spatial filter of digital strain: limited space, weak privacy, poor sound insulation and the overlap of work and rest were frequently described alongside greater tension. Third, balconies, terraces, gardens, parks and quiet walkable outdoor areas were described as facilitating recovery, whereas traffic, noise, dense built form and weak neighbourhood cohesion were described as conditions that could compound digital pressure. The findings support further investigation of a socio-spatial model of digital anxiety and suggest that housing quality, neighbourhood conditions and access to immediate outdoor space may be relevant to recovery from digital overload.

Keywords: digital anxiety; urban living environment; housing quality; neighbourhood; sound insulation; qualitative interviews

4. AIoT as a driving force for the transformation of community care

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Abstract

The integration of Artificial Intelligence (AI) and the Internet of Things (IoT), collectively referred to as AIoT, is fundamentally transforming community healthcare from episodic, institution-centered care toward continuous, data-driven, and preventive care. This paper presents a conceptual framework that positions AIoT as a sociotechnical innovation requiring the co-evolution of technology, governance, organizational structures, and professional practices. AIoT-enabled systems leverage real-time data from wearables, home-based medical devices, and environmental sensors, while AI algorithms convert these data into descriptive, predictive, and prescriptive insights that support early detection, personalized interventions, and coordinated care. The framework emphasizes that technological capabilities alone do not generate value; improved health outcomes depend on effective care coordination, interoperable infrastructures, robust governance, and inclusive implementation. The increasing shift of healthcare toward home and community settings necessitates new professional roles, standardized decision-making processes, digital competencies, and adaptive financing models. Furthermore, AIoT enables community care to function as a learning health system, where continuous data collection supports ongoing evaluation, policy adaptation, and population health management. At the same time, successful implementation requires addressing critical challenges related to privacy, accountability, interoperability, digital inclusion, and public trust. By integrating technological, organizational, and societal perspectives, the proposed framework provides a comprehensive foundation for understanding how AIoT can enhance accessibility, quality, efficiency, and sustainability in community healthcare while supporting equitable and responsible digital transformation.

5. Bridging the Housing Gap: Leveraging Artificial Intelligence to Streamline Permitting Processes in the Dutch Construction Sector

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Abstract

The Dutch housing market faces a structural crisis, with an annual requirement of 100,000 new homes struggling against complex regulatory frameworks and lengthy permit procedures. Despite the maturity of Artificial Intelligence (AI), its application in municipal governance remains nascent. This article explores the strategic implementation of AI within the Municipality of Aalten to accelerate building permit issuance. By analyzing four key AI techniques-Machine Learning, Deep Learning, Natural Language Processing, and Computer Vision-this study identifies a "top three" suite of high-impact, low-risk applications: AI intake assistants, automated completeness checks, and automated communication. The findings suggest that a phased, human-in-the-loop approach can significantly reduce lead times and administrative burdens while maintaining ethical standards and legal compliance.

Keywords: Artificial Intelligence, Housing Crisis, Municipal Governance, Permit Procedures, Digital Transformation, Aalten, Achterhoek.

6. Village Infill and Quality Participation: A Facility Management Case Study

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Abstract

Purpose The purpose of this research is to identify strategies to enhance public support for housing infill projects within the urban core of Aalten, The Netherlands. The objective is to speed up project realization while preserving and promoting the livability of neighborhoods. Through a dual focus on expert perspectives and resident experiences, the study seeks to offer actionable recommendations for urban facility management. These recommendations aim to boost community engagement, improve communication channels, and better align infill housing development with the needs, concerns, and preferences of local residents, ultimately leading to more sustainable and widely supported urban growth. Design/methodology/approach The methodology section outlines the approach taken to identify key livability factors relevant to the development of infill housing locations in Aalten. This study employed a qualitative research design, incorporating both desk research and fieldwork. Desk research included the review of municipal and national policy documents, complemented by the application of Leidelmeijer's Livability Model to assess the alignment between people and their environment ("person-environment fit"). Field research involved conducting semi- structured interviews with selected municipal officials responsible for urban planning and public participation. The data gathered were analyzed using open and axial coding to extract themes and patterns. To ensure the validity of findings, the analysis was cross-referenced with the livability model. Reliability was reinforced by selecting knowledgeable experts, using a uniform interview format, and ensuring confidentiality to promote honest responses. Findings The Dutch housing market, including in Aalten, is under significant pressure due to increasing demand and frequent resistance to new developments. The research findings emphasize that greater public support can be achieved by involving residents early and consistently in the planning process. Important livability factors influencing support include clear communication, opportunities for meaningful involvement, access to information, enhancement of public spaces, strong neighborhood connections, and thorough post-project evaluation. Many residents expressed a desire to be truly engaged, rather than passively informed. However, previous projects revealed issues such as poor communication, a lack of a clear point of contact, and insufficient attention to neighborhood-specific concerns. The study recommends organizing more public meetings, implementing comprehensive communication strategies, and establishing a central contact person. Tools such as resident newsletters, feedback platforms, and a resident sounding board group could significantly enhance trust and participation. Ultimately, cooperation among municipalities, residents, and other stakeholders is essential to creating livable neighborhoods while meeting urgent housing needs. Research limitations/implications While this study underlines the importance of resident engagement, it is limited by its geographic focus on Aalten, which may restrict generalization to other regions with different social or administrative contexts. Furthermore, the sample consisted mainly of municipal officials, which may not fully reflect the range of resident opinions. The research concentrated on the early phases of infill development, suggesting future studies should investigate long-term impacts. Potential conflicts between stakeholders were not addressed in depth and represent another area for further exploration. Practical implications The research provides clear guidance for urban planners and municipal bodies. It suggests that municipalities should prioritize early and continuous resident involvement by setting

up structured feedback mechanisms and transparent communication pathways. This proactive approach can minimize resistance, build public trust, and result in developments that better reflect community needs. Social implications Engaging residents in housing development fosters social inclusion, strengthens neighborhood identity, and promotes community well- being. Participation builds trust and fosters a sense of ownership, contributing to harmonious urban growth. Originality/value This study contributes original insights by integrating a livability framework with practical urban management strategies. It provides valuable tools for improving public participation in housing development in the Dutch context.

Keywords: participation - village - facility management - municipality - housing Justification This research was carried out under the daily supervision of Jan Veuger, interim manager for Housing and Public Housing at the Municipality of Aalten. Conducted by Haket (2025) as a research student, it reflects findings from the 2024-2025 research period and was first presented at the 2025 Conference of Interdisciplinary Research on Real Estate (CIRRE). Confidential data has been excluded. Summary The municipality of Aalten, located in the Netherlands, is challenged with accelerating housing construction due to rising demand and demographic shifts in the Achterhoek region. However, infill development-building within existing urban areas-requires community support to avoid delays and resistance. This research aimed to identify how to increase local support for housing expansion in Aalten's core to speed up project realization while maintaining livability. A mixed-methods approach was used, combining expert interviews with municipal staff and surveys distributed to residents near two infill sites: Hoge Es and Ludgerstraat. The findings revealed five key factors influencing support: communication and involvement, information provision and expectation management, improvements to public space, integration with the neighborhood, and joint project evaluation after completion. Communication emerged as the most critical issue. Residents reported unclear roles among stakeholders, inconsistent messaging, and a lack of personal interaction. Merely providing information was seen as insufficient-residents desired active involvement in the planning and development process. The research suggests more frequent meetings with residents, centralized communication, and a designated contact person to foster greater transparency and collaboration. A key recommendation is appointing an area director during the development process. This individual would coordinate activities, act as a point of contact, and organize regular updates via newsletters and walk-in hours. Additionally, the area director would establish a sounding board group to ensure residents' concerns and ideas are incorporated into planning. Upon completion, a joint evaluation involving the neighborhood would finalize the project and enhance a sense of shared ownership. These measures aim to increase community support and streamline decision-making, thereby accelerating housing development. According to the Association of Dutch Municipalities (2024), such approaches can significantly reduce delays in housing projects. Future research could explore how different housing types-like social rental or owner-occupied homes-affect community engagement. It may also be useful to assess how the inclusion of commercial or social facilities influences support and to study the long-term effects of infill on livability, particularly in smaller hamlets where dynamics differ from urban cores.

7. A Future Perspective on Healthcare Real Estate in the Netherlands

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Abstract

Abstract not provided in the submitted manuscript.

8. Energy Regulation in Transition: From Macro Framework to Micro-Intelligence with InfraVitaal

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Abstract

The energy transition is developing at a rapid pace and is accompanied by digitalization, electrification, and decentralization. Together, these developments constitute a fundamental system transformation. Energy networks are evolving from linear systems (production-transport-consumption) into adaptive, data-driven ecosystems. As a result, energy regulation is shifting from a purely technical issue to an integrated challenge in which data, governance, spatial planning, and societal value take center stage. Artificial intelligence (AI) plays a dual role in this context. On the one hand, AI optimizes energy flows by better predicting supply and demand, balancing grids, and enabling more efficient use of storage and infrastructure. This can lead to significant energy savings. On the other hand, AI itself is energy-intensive, as data centers, chips, and cooling systems consume large amounts of electricity and water. As such, AI becomes not only a solution but also a new burden on the energy system. The integration of AI transforms energy infrastructures into smart, self-learning systems. Local balancing of supply and demand (for example, at the neighborhood or building level) is becoming increasingly important to reduce pressure on the main grid. Digital twins and real-time data make it possible to simulate scenarios and better plan investments. At the same time, this development requires systems thinking: energy, AI, and semiconductors are closely interconnected and must be approached integrally to prevent new bottlenecks such as grid congestion or excessive water use. In the Netherlands, this system transformation becomes concretely visible in grid congestion. Due to mismatches between generation and consumption and limited grid capacity, waiting times for connections arise. Traditional solutions such as grid reinforcement are slow and costly. AI offers alternatives, including demand shifting, smart control of devices, and local microgrids. The energy transition is also increasingly linked to spatial planning through the Environment and Planning Act (Omgevingswet), as energy and digital infrastructures have a physical impact on the living environment. From a policy perspective, the focus is shifting toward integrated steering. Proposals include conditional access to the grid (with obligations for flexibility), precise temporal matching of renewable energy, spatial planning of digital infrastructure, utilization of residual heat, and investments in labor market transition. The energy transition requires adaptive governance: policies must remain flexible and responsive to rapid technological and societal developments. At the micro level - such as homes and buildings - energy regulation becomes tangible. Inefficiencies often arise due to fragmented systems (solar panels, batteries, heat pumps). Integrated solutions, such as those provided by InfraVitaal, connect these systems into a single smart energy management system. This enables households to use energy more efficiently, reduce costs, and contribute to grid stability. This demonstrates that system integration is not merely a policy concept but also practically applicable. Effective energy regulation in the AI era requires several conditions: data transparency and interoperability, adaptive policy frameworks, societal acceptance, integrated spatial planning, and strong leadership. The core message is that the energy transition constitutes an integrated system challenge. Only through coherence between technology, policy, and practice - from macro to micro level - can a sustainable and flexible energy ecosystem be realized.

9. Towards a Holistic Paradigm: A Decade of Interdisciplinary Real Estate Research (2016-2025)

Abstract

This article reflects on ten years of the Conference of Interdisciplinary Research on Real Estate (CIRRE). By analyzing 436 scientific contributions through a qualitative grounded theory approach and quantitative mapping, the study identifies a fundamental shift in the field: the transition from siloed, mono-disciplinary inquiries to a holistic, human-centric, and sustainable paradigm. The research underscores that the built environment is a complex ecosystem requiring the synthesis of architecture, psychology, economics, and data science to address modern societal challenges.

10. Well-being in Urban Environments: A Psychological Perspective on Sustainable Urban Development

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Abstract

This article develops a psychological perspective on well-being in urban environments and argues that psychological well-being should be understood as a core dimension of sustainable urban development. Contemporary cities are increasingly shaped by environmental uncertainty, technological acceleration, demographic change, social fragmentation and growing psychological stress. These processes influence not only the physical organisation of urban space, but also residents' everyday experiences of safety, belonging, autonomy, restoration, participation and quality of life. The article connects theories of human needs, Self- Determination Theory, environmental psychology, sense of community and pro- environmental behaviour with recent Slovenian research on urban resilience, smart-city well-being, environmentally conditioned needs and sustainability- related values. It builds on the previously developed concept of environmentally conditioned needs as a bridge between basic psychological needs and the concrete conditions of the living environment, and extends it within a broader integrative model of urban well-being and sustainability. The article further proposes a psychological model of sustainable urban development in which urban environmental conditions influence well-being through environmentally conditioned needs and psychological mediators such as perceived environmental quality, perceived safety, sense of community, place attachment, perceived control, social cohesion, environmental attitudes and perceived behavioural efficacy. The model also emphasises reciprocal pathways through which residents' participation and pro-environmental behaviour contribute to more sustainable and resilient urban environments. The article concludes that sustainable urban development should not be evaluated only through infrastructural, technological, environmental or economic indicators, but also through psychological indicators that capture residents' lived experience. A sustainable city is therefore not only a city that functions efficiently, but a city that enables people to live safely, meaningfully, connectedly and responsibly.

Keywords: psychological well-being, sustainable urban development, environmentally conditioned needs, urban quality of life, sense of community, pro- environmental behaviour, urban resilience

11. Digital Measurement of Sociospatial Adaptation in Post-Disaster Temporary and Permanent Housing Settlements: Hatay Earthquake Case

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Abstract

Post-disaster housing processes involve not only physical reconstruction activities but also the social, psychological, and spatial adaptation of individuals to newly formed living environments. During the transition from temporary shelter areas to permanent housing settlements, disaster-affected individuals experience signi□icant changes in spatial perception, neighborhood relations, social solidarity networks, and sense of belonging. However, post- disaster housing policies predominantly focus on the provision of physical settlements, while the multidimensional structure of socio-spatial adaptation remains inadequately addressed. In this study, socio-spatial adaptation processes in temporary and permanent post-disaster housing areas were examined through digital methods and interdisciplinary analytical techniques. Within the scope of the study, levels of spatial attachment, social support relationships, daily spatial usage practices, and environmental perceptions of individuals affected by the Hatay earthquake who moved to temporary and/or permanent housing were evaluated comparatively. The research was grounded in a holistic methodology integrating approaches from environmental psychology, disaster resilience, urban planning, and spatial data analysis. A mixed-methods approach was adopted, incorporating cognitive mapping, social network analysis, Geographic Information Systems (GIS)-based spatial assessments, psychosocial surveys, and machine learning-supported classi□ication methods. Participants were asked to identify and map areas where they felt safe, locations they tended to avoid, and their daily movement routes. In addition, neighborhood relations and solidarity patterns were analyzed through social network data, while GIS-based indicators such as accessibility to green spaces, transportation connectivity, and proximity to public services were evaluated as components of the physical environment. The □indings revealed that levels of social belonging in permanent housing areas were signi□icantly higher compared to temporary settlements. In particular, shared public spaces, pedestrian accessibility, the intensity of social interaction, and everyday encounters at the neighborhood scale were identi□ied as key factors strengthening the sense of belonging. Machine learning results further demonstrated that the primary variables affecting socio-spatial adaptation were social support intensity, accessibility level, and shared space usage. The study concludes that post-disaster housing policies should focus not only on meeting physical shelter needs but also on developing settlement models that strengthen community relations and spatial attachment.

12. Traceable Reuse Intelligence: Turning Underused Buildings into a Defensible Municipal Action Pipeline

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Abstract

Small and mid-sized municipalities increasingly face a recurring mismatch: parts of the building stock become underused or vacant while demand grows for affordable services, community functions, and climate-resilient spaces. Decisions on which assets to reuse first are often fragmented across departments and stakeholders, based on partial evidence, and difficult to justify retrospectively, leading to avoidable operational costs and missed opportunities to unlock value from existing assets. This contribution presents a data-driven decision-support approach that integrates heterogeneous municipal and facility datasets into a transparent prioritisation and pathway recommendation process. The research begins by establishing a minimal "asset-and-space commons" that harmonises asset registry data, vacancy/underuse signals, facility management indicators like maintenance events and operational cost proxies, condition and energy performance proxies, and basic socio-spatial indicators related to accessibility and proximity to essential services. A typology of underuse is then developed to constrain feasible interventions, alongside a structured library of reuse pathways such as conversion, temporary activation, mixed-use adaptation, community service hubs, and circular refurbishment. Building on these components, a multi-criteria "Reuse Potential Score" is computed to balance feasibility and expected neighbourhood value across social, environmental, operational, and economic dimensions, complemented by scenario testing and sensitivity checks to surface key assumptions and uncertainty. A central emphasis is on producing outputs that are not only explainable but also traceable: each indicator is linked to its source, timestamp, and transformation steps, and scenario variants are versioned to preserve an auditable history of how recommendations evolve as data improves. Such traceable records may be packaged in a standardised building-level format, among other reporting mechanisms, to support cross-stakeholder communication and transferability.

Keywords: Underused Buildings; Vacancy; Adaptive Reuse; Municipal Asset Management; Facility Management; Decision Support; Traceability. 2

13. Resilience of Traditional Balinese Settlement in Facing Climate Change for the Sustainability of Future Settlements

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Abstract

Bali Island, as a tourism destination, is currently experiencing significant developments. Population growth influences the provision of facilities and accommodations, which in turn impacts residential development. Climate change is the cumulative impact of uncontrolled development, increasing the risk of natural disasters such as floods, landslides, abrasion, rising temperatures, and ultimately, damage to residential infrastructure. Disasters such as floods and landslides have occurred in several areas in Bali, such as Denpasar City, Gianyar Regency, Buleleng Regency, and several other areas, which have had an impact on environmental infrastructure. However, the island of Bali, with its enduring local wisdom, both cultural and architectural, is believed to be resilient to global developments, including climate change. These values are still applied in traditional Balinese settlements. This study examines how traditional Balinese settlements are able to survive in anticipating and responding to the impacts of climate change. The key to this research is how the application of local wisdom can maintain the integrity and sustainability of traditional settlements, including their culture and architecture. This study employs qualitative methods with a descriptive approach to explain the influence and impact of local values implemented in traditional settlements and examines their applicability to future settlements. Observations in traditional villages such as Julah Village in Buleleng Regency, and Tenganan Village in Karangasem Regency, serve as examples of how local values are applied in the face of global developments. Interviews with village leaders and religious leaders were conducted to obtain valid information on the traditional values applied in each settlement, thereby maintaining its local identity. Deep literature review was used to understand the local values that extant in Indigenous villages of Bali Aga. This study provides recommendations and strategies for implementing traditional Balinese local values that can serve as a reference for the environmental sustainability of future settlements resilient in the face of future global climate changes. By implementing these local values, the survival and sustainability of the future traditional settlements can create a local identity on the Island of Bali.

Keywords: resilience, local values, traditional Balinese settlement, sustainability, Bali Aga.

14. INVESTMENT IN SOCIAL INFRASTRUCTURE FOR SUSTAINABLE DEVELOPMENT IN THE WESTERN BALKANS: LEGISLATION AND POLICIES IN KOSOVO

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Abstract

Residents satisfaction is influenced by multiple factors, including urban design, respect for privacy, access to green spaces, the availability of medical services, kindergartens, primary and secondary schools, markets and shops, neighbourhood safety, access to facilities for the elderly, public transport, and related amenities. The primary aim of this research is to investigate the problems arising from the failure to meet residents' basic needs and to explore potential solutions for the development of health and social infrastructure, which remains significantly underdeveloped in Kosovo and the surrounding region. Unregulated urban growth has contributed to dissatisfaction among residents of both public and private neighbourhoods regarding access to essential services such as healthcare, education, kindergartens, transport, and markets. Health and social infrastructure encompasses the facilities through which health, education, and housing services are delivered. Financing development of health and social infrastructure, as expected by residents, is primarily perceived as a municipal responsibility, with service provision originating from the same level of governance. This study compares neighbourhood development and access to social infrastructure in the Western Balkans with corresponding practices in Western Europe, presenting case studies of new private and public neighbourhood developments. In line with the growing emphasis on human capital development and the knowledge economy, the legal environment should play a more active role in facilitating health and social infrastructure provision. This article presents the foundations of health and social infrastructure and examines legal basis for its provision. The study identifies two primary spatial legal barriers: (a) the lack of regulation of social infrastructure within spatial planning legislation, and (b) low property tax rates combined with the absence of dedicated financing mechanisms for social infrastructure development. The findings may inform the optimal organisation of social infrastructure for healthcare, education, and housing servicesan issue also under examination by European institutions.

Keywords: social infrastructure, spatial planning, legislation, education, healthcare, social housing

15. Reshaping Public Space Through Authority: The Transformation of Expression and Protest Spaces in Al-Kut Provincial Council Square

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Abstract

This research examines the relationship between power and the reshaping of public space through design interventions, based on the premise that public space is not a neutral or static entity, but rather a product of social, political, and institutional interactions. The research focuses on the role of urban design in reorganizing spatial uses and shaping patterns of interaction within it, and the impact of this on its functions, meanings, and social and civic value. The research is grounded in the concept of the right to the city, which affirms the right of individuals and groups to access, use, participate in shaping, express themselves within, and assemble within urban space. The research adopted a qualitative approach and a case study methodology to analyze the Wasit Governorate Council Square in the city of Kut, given its central location, its connection to the government institution, and its history as a space for assembly, expression, and protest. Design interventions included the removal of the previous platform and the addition of a central monument, along with the gradual conversion of large portions of the square into parking spaces. Data was collected from photographs, interviews, and official and media sources, and analyzed using NVivo software according to social, functional, spatial, and symbolic indicators. The results showed that the change extended beyond the physical aspect, as the removal of the platform and the central monument, along with the expansion of parking areas, reduced the square's flexibility and its capacity to accommodate gatherings, expressions, and protests. The research concludes that urban design serves as a tool for spatial governance and the reshaping of public space., civic, and symbolic value of public space and the exercise of rights in the city. Keywords. Public space, Authority, urban design, protest, civic expression, spatial control, Al-Kut Provincial Council Square.

16. Material stocks and flows in the Philippines residential building sector

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Abstract

Buildings account for large shares of global material and energy use. The extraction and use of these resources contribute to climate change, pollution, resource depletion, and biodiversity loss. In the Global South, rapid population growth and urbanization are increasing the demand for new construction. In the Philippines, this challenge is compounded by high exposure to natural hazards, large shares of self-built housing, and limited enforcement of building codes throughout the construction process, highlighting the need to better understand resource use in existing and future residential buildings. This study investigates prevalent residential building archetypes in the Philippines to assess their material composition and intensity. A parameterized modelling approach is used to capture uncertainties arising from variations in building design and construction practices. Key parameters include component dimensions, material composition (e.g., cement content in concrete blocks), and structural characteristics. Archetypes are modelled using Rhino-Grasshopper, and the resulting material intensity and composition data are integrated into mini-RECC, an open-source material flow analysis (MFA) model. Using mini-RECC, we assess future material demand flows and associated greenhouse gas (GHG) emissions driven by population growth, floor area per capita, and building lifetime assumptions. Results indicate greater variation in material intensity among small, detached houses with masonry base construction materials than among larger or multi-story building archetypes. Under a business-as-usual (BAU) future scenario, demand for concrete- and cement-based materials increases substantially toward 2060, leading to a corresponding rise in GHG emissions. The findings provide a basis for evaluating material-efficiency strategies and emission reduction pathways for the Philippine residential sector, while supporting the provision of adequate housing for a growing population.

17. Eco-City Development Model for Denpasar, Bali: Integration of Ecological Principle toward a Sustainable City

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Abstract

Rapid urbanisation in Denpasar has intensified multidimensional environmental pressures, particularly in the areas of transportation, water resources, green open space, and waste management. Although the concept of environmentally friendly cities has been well established in global urban sustainability discourse, its integration with the distinctive cultural and ecological contexts of the Global South remains comparatively underexplored. To address this gap, this study employs a sequential exploratory mixed-methods design that integrates stakeholder interviews, a community survey, and focus group discussions to develop the Tri Hita Karana-based Eco-City Framework (THK- ECF). The framework operationalises the traditional Balinese triad of parahyangan (spiritual relations), pawongan (social relations), and palemahan (human-environment relations) through the six ecological principles of Sad Kerthi. These principles provide a culturally grounded basis for addressing systemic urban pressures, including rapid motorisation, groundwater depletion, the loss of green open spaces, and increasing organic waste generation. By grounding urban sustainability in customary ethics and local ecological values, the study reconceptualises eco-city planning as a form of relational balance among spiritual, social, and environmental dimensions. The resulting framework offers a context-sensitive and potentially transferable model for advancing sustainable urban development in rapidly urbanising regions of Indonesia and other culturally diverse contexts of the Global South.

18. Participation in Smart Mobility: Trends in Digital Tool

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Abstract

The current context of rapid digitalization in urban mobility, coupled with the ever-persistent need for public participation in urban mobility planning, provides a critical starting point for this study. As innovative technologies like digital mobility platforms, twins, and other digital tools redefine cities' mobility systems, participation is also mediated through digital tools and methods. This study explores the concept of participation in the context of digitalization in mobility. A systematic search strategy in Scopus and Web of Science yielded 521 unique studies. The studies went through title-based and abstract-based screening processes, resulting in 27 relevant studies, which were further analyzed and reviewed in full. The results highlight thematic trends in the literature regarding emerging tools, which are further discussed in terms of methods, challenges, and best practices associated with participation. The findings illustrate the requirements for improvements in participatory frameworks and suggest ways for users' active involvement in smart mobility planning. The implications for policy and practice remain regarding a better understanding of digital tools and further research direction for future-oriented transportation systems.

19. Decision-making strategies for sustainable refurbishment of swimming facilities

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Abstract

Swimming facilities play a crucial role in society. However, they are among the most energy-consuming public buildings and require special attention to operate in a sustainable way. This study investigates how operational data and technical condition of swimming facilities can be used to support decision-making strategies in sustainable refurbishment. Technical and operational performance data were collected from 40 swimming facilities in the region of Vestfold and Telemark in Norway were collected through surveys, interviews, and on-site observations. The variation among the collected was considerable. During the data collection the awareness of facilities technical and operational condition was investigated for three different levels in the organization; facilities managers at the municipality, facility manager and technical operators. For the two upper levels, it was found that the requested knowledge of the facility was lacking while the technical staff reported what was requested. Only 53% of the contacted facilities managed to answer the questionnaire. The quality of the data is highly dependent on the individuals' knowledge about the facility, most of which lies in the daily operation. Revealing a lack of systematic reporting of the buildings' technical condition and operation performance at municipal organizational level. The non- response rate (47%) might be linked to data availability which potentially leads to underrepresentation of facilities that are less able to provide data. On-site inspections were conducted at four facilities, allowing for diagnosis of current conditions but not enabling broad generalizations across the portfolio. Further research should include a larger portfolio, to establish whether the data availability pattern we observed in Vestfold Telemark is recurring problem.

20. Living circumstances and housing conditions of students in higher education centres

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Abstract

The living circumstances and housing conditions of students have become an increasingly important research topic as higher education systems have expanded and as student accommodation has developed into a distinct segment of urban housing markets. This theoretical article synthesises the international scholarly literature on student housing and proposes an integrative conceptual framework for studying the living circumstances of students in higher education centres. Based on a narrative review of research published in peer- reviewed journals, the article first clarifies the concepts of living circumstances and housing conditions and develops a typology of the main forms of student accommodation. It then examines six theoretical perspectives that structure the field: housing pathways and transitions to adulthood, residential satisfaction, student integration and involvement, studentification and urban change, housing and well-being, and the political economy of student housing. The synthesis shows that student housing simultaneously operates as a stage in the housing biography, a determinant of academic and social integration, a factor of health and well-being, and a driver of neighbourhood change. The article concludes by formulating theoretical propositions and identifying research gaps concerning affordability, comparative welfare contexts and the long-term consequences of student housing conditions.

21. Use and satisfaction of older people with digital technologies

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Abstract

In the face of demographic change and the rapid ageing of the population, digital technologies can make an important contribution to safer, easier and more independent living for older people, most of whom wish to grow old in their own familiar home environment. However, their use remains uneven and is often confined to basic solutions, while data on prevalence alone do not reveal how useful older people find individual technologies in everyday life. This paper presents the use of twenty-one digital technologies among older people in Slovenia - namely basic technologies and internet services, technologies related to health and health monitoring, technologies providing help with the home and household tasks, and technologies relating to safety - as well as the satisfaction of their users. The data were collected through a telephone survey of 1,000 people aged 60 and over, who indicated for each technology whether they used it and, if they did, rated their satisfaction with its usefulness on a five-point scale. The results show that prevalence is markedly uneven: basic technologies and established internet services are used by the great majority of respondents (mobile phone 91.8%, internet 88.8%, computer 75.5%, online banking 74.6%), whereas assistive, health-related and safety technologies are used by only a few per cent (automatic fall detection 4.0%, pull-cord switch 1.1%). Satisfaction, by contrast, is high and relatively uniform, as between 78.6% and 95.4% of users are satisfied or very satisfied; the highest ratings go to technologies with a direct, everyday benefit and the lowest to those whose benefit is latent and preventive. The findings show that the barriers to wider use lie before entry into use rather than in the experience of use and can serve as a basis for designing user-adapted digital solutions and support measures for older people.

22. Acceptance of digital technologies among older non-users

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Abstract

With the rapid ageing of the population, digital technologies can make an important contribution to preserving the independence and autonomy of older people, most of whom wish to grow old in their own familiar home environment. However, a considerable proportion of older people neither use these technologies nor trust them, as the technologies are often insufficiently adapted to their needs and abilities, while acceptance is further shaped by limited digital skills, low self- confidence, financial barriers, concerns about privacy and the fear that technology will replace personal contact. This paper presents the acceptability of twenty-one digital technologies among those older people in Slovenia who stated that they do not use them - namely basic technologies and internet services, technologies related to health and care, technologies for the home and household tasks, and technologies relating to safety. The data were collected through a telephone survey of 1,000 people aged 60 and over, in which respondents indicated for each technology whether they used it, and non-users then rated on a five-point scale how acceptable using it would be for them. The results show that acceptability is markedly stratified and, at the level of technologies, is inversely associated with actual prevalence: it is highest for technologies relating to safety (detection of hazards in the home 75.3%, automatic fall detection 75.0%) and for technologies related to health and care (approximately two thirds of non-users), and lowest for technologies that require active, independent use (internet 7.5%, mobile phone 9.4%, online banking 19.1%, computer 20.6%), which are also explicitly rejected by up to 47.8% of their non-users. The high share of undecided responses (between 20.9% and 62.3%) indicates that many attitudes are not yet formed and stem from the absence of personal experience. Because acceptability was asked only of the non-users of each technology, every estimate refers to a different subgroup, ranging from 82 non-users of the mobile phone to 989 non-users of the pull-cord switch, and the inverse association is a technology-level pattern that may in part reflect the changing composition of the non-user group; the analysis is descriptive and cross-sectional. The findings can serve as a basis for designing differentiated approaches to strengthening the digital inclusion of older people.

23. Attitudes towards digital technologies among older people

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Abstract

In the face of demographic change and the rapid ageing of the population, digital technologies can make an important contribution to preserving the independence and autonomy of older people, most of whom wish to grow old in their own familiar home environment. However, older people are often more cautious in accepting digital technologies, as they have less experience with them, doubt their own abilities and are reluctant to accept changes in their living environment. This paper presents the attitudes of older people in Slovenia towards digital technologies in the home environment, grouped according to constructs drawn from established acceptance models - namely perceived usefulness, expected difficulty of use, social influence, fear of use, perceived security, affordability and the integration of technologies into the living environment - as well as older people's preferences regarding the way in which digital technologies are implemented (modes of presentation, providers, forms of invitation and venues). The data were collected through a survey of 1,000 older people in Slovenia, who rated the statements on a five-point scale of agreement or preference. The results show that older people mostly recognise digital technologies in the home environment as useful and believe that their use can be learned; they are most critical of their affordability, and opinions are also divided regarding the protection of personal data and their own ability to use them. Regarding implementation, older people most want practical ways of becoming familiar with digital technologies, trying them out at home and workshops, invitations by e-mail, and delivery organised by educational institutions. The analysis is descriptive and no measure of technology acceptance (behavioural intention, willingness to accept or actual use) was collected, so the study describes reported attitudes and stated preferences and does not establish which factors influence acceptance. The findings can serve as a basis for designing policies and digital literacy programmes for older people.

24. Non-Invasive Thermal Comfort Detection in Buildings: A Systematic Review of Bio-Sensing and Artificial Intelligence Approaches

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Abstract

Thermal comfort is a key component of indoor environmental quality (IEQ), in□luencing occupant health, well-being, satisfaction, and productivity while affecting the energy performance of buildings. Conventional thermal comfort assessment methods rely on environmental measurements and subjective occupant feedback, limiting their ability to support real-time and personalized building operation. This systematic literature review examines recent advances in non-invasive thermal comfort monitoring using bio-sensing technologies and arti□icial intelligence (AI), focusing on studies published between 2020 and 2025. Following a PRISMA-guided review process, 21 empirical studies involving human participants were identi□ied and analyzed. The reviewed studies investigate a range of physiological and behavioral indicators, including facial thermal imaging, skin temperature, heart-rate variability, facial micro-expressions, wearable sensors, and vision-based monitoring systems. The □indings reveal a growing shift toward occupant-centric approaches capable of detecting thermal discomfort without explicit user interaction and supporting adaptive environmental control strategies. Machine-learning models demonstrate promising potential for improving the accuracy and responsiveness of thermal comfort assessment in both controlled and real-world environments. However, challenges remain regarding model generalizability, limited sample sizes, methodological inconsistencies, and validation across diverse building contexts. The review highlights emerging trends and research gaps and discusses the role of bio-sensing and AI technologies in enabling healthier, more energy-ef□icient, and responsive indoor environments.

25. Creating and Sustaining Successful Academia- Practice Collaboration: A Scoping Review

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Abstract

Collaboration between academia and practice is increasingly recognised as essential for addressing complex societal and organisational challenges by strengthening knowledge exchange, innovation, and the implementation of research in practice. Despite its growing importance, research on academia-practice collaboration remains fragmented across disciplines, with barriers, enabling factors, and collaboration mechanisms often examined in isolation. This study addresses this gap through a scoping review that synthesises the existing literature to develop a more integrated understanding of successful and sustained academia-practice collaboration. The review followed a structured scoping review methodology using the Scopus database. An initial search identified 1,250 records, of which 999 unique studies remained after duplicate removal. Through a multi-stage screening process involving title refinement, abstract screening, and full-text assessment, 22 studies were included in the final thematic synthesis. The findings show that successful academia-practice collaboration is influenced by interconnected barriers, enabling conditions, and collaboration mechanisms rather than by isolated factors. Recurring barriers include misaligned expectations, organisational capacity constraints, governance challenges, and implementation difficulties. Successful collaborations are supported by institutional commitment, trust-based relationships, shared objectives, and effective governance arrangements, while mechanisms such as structured coordination, reciprocal knowledge exchange, co-production, boundary spanning, and iterative learning enable collaborative partnerships to develop and generate sustainable outcomes. The study contributes to the literature by proposing an integrated conceptual interpretation that brings together previously fragmented perspectives on academia-practice collaboration. Rather than viewing barriers, enablers, and collaboration mechanisms independently, the review demonstrates how their interaction shapes successful collaboration across organisational and disciplinary contexts. The findings provide practical guidance for designing and sustaining collaborative partnerships while offering a foundation for future empirical research on academia-practice collaboration.

26. Bridging the Operational Gap in Positive Energy Districts: An Urban Facilities Management Perspective from Treklang, Norway

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Abstract

Cities play a central role in climate-neutral transitions, increasing interest in Positive Energy Districts (PEDs) as integrated approaches combining renewable energy systems, energy flexibility, smart technologies, and sustainable urban development. However, PED research has focused primarily on technological innovation and planning, with less attention to the long-term operational governance required to sustain district performance after project delivery. As climate-neutral districts become increasingly interconnected socio- technical systems, operational complexity frequently exceeds the capacity of conventional building-oriented governance and facilities-management structures. This paper investigates these challenges through an empirical case study of Treklang in Bærum, Norway, a high-ambition public development associated with broader PED and Zero Emission Neighbourhood (ZEN) ambitions. It examines how operational gaps emerge between sustainability ambitions formulated during planning and the realities of long-term district operation. Drawing on interviews, field observations, participatory collaboration with the municipality, focus group discussions, and document analysis, Treklang is analysed through the combined lenses of PEDs and Urban Facilities Management (Urban FM). The findings reveal significant operational fragmentation after handover despite advanced technologies, integrated energy infrastructure, and strong sustainability ambitions. Key challenges include fragmented governance across municipal sectors and external operators, unclear operational responsibilities, weak lifecycle integration, limited operational capacity to manage advanced systems, regulatory constraints on energy sharing, and tensions between sustainability goals and everyday operational practices. The study demonstrates that many PED challenges are institutional and governance-related rather than primarily technological. The paper argues that Urban FM is not facilities management at larger scale, but as an emerging integrative governance and operational logic required for coordinating interconnected climate-neutral districts across lifecycle phases. The study contributes to PED research by shifting attention from technological optimisation toward operational governance and lifecycle stewardship, while also conceptualising Urban FM as a missing integrative layer between urban planning, sustainability ambitions, and long-term district operation.

Keywords: Positive Energy Districts, facility management, climate-neutral cities, smart buildings, urban governance, operational complexity

27. Sustainable Concrete Development Using Eggshell Powder and Bamboo Leaf Ash for Built Environment Sustainability

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Abstract

The construction industry is increasingly encouraged to adopt waste- derived materials that can support waste valorization within a circular-economy framework. Eggshells and bamboo leaves are abundant waste materials with calcium-rich and silica-rich characteristics, respectively, and have potential for use in concrete applications. This study aims to: (1) analyze the effect of eggshell powder-bamboo leaf ash (ESP-BLA) addition on the compressive strength of concrete at curing ages of 7, 14, and 28 days; and (2) identify the ESP-BLA addition level that exhibits the highest observed compressive strength within the investigated range. An experimental method was employed using ESP-BLA as an additional waste-derived material at proportions of 0%, 2.5%, 5%, 7.5%, 10%, and 12.5% by weight of cement. Cylindrical concrete specimens measuring 100 mm in diameter and 200 mm in height were prepared and subjected to wet curing. Slump and compressive strength tests were conducted at curing ages of 7, 14, and 28 days. The results indicate that ESP-BLA addition produced varying effects on the compressive strength of concrete. At 28 days, the 10% ESP-BLA mixture achieved the highest observed mean compressive strength of 21.04 MPa, while the lowest mean strength was 18.67 MPa. The study provides experimental evidence on the effects of ESP-BLA addition on concrete workability and compressive strength, while its sustainability contribution is limited to the potential valorization of waste-derived materials.

28. Framework for Integrating Built-Environment Determinants into the WISH Digital Model for Breast Cancer Follow-up and Survivorship

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Abstract

Women with breast cancer, as well as women exposed to breast cancer risk, are increasingly supported through digital health models that promote monitoring, prevention, lifestyle change, and out-of-hospital care. However, such models often pay limited attention to the everyday built environment in which women live, access services, move, rest, and maintain social participation. This study presents the development of a built-environment framework and questionnaire to be integrated into the WISH (Women's Integrated Support for Hormonal Health) digital follow-up model for women with early breast cancer receiving adjuvant hormonal treatment. The purpose is to identify how home, neighbourhood, and service-access conditions can be considered as contextual determinants in breast cancer prevention and survivorship. After a scoping review, we synthesised prominent environmental determinants, barriers, and enabling conditions into four dimensions: access to care and services; green spaces and physical activity environment; indoor light, sleep, and comfort; and social connection and everyday support. The resulting framework and questionnaire, which includes baseline questions, short follow-up questions during implementation, and end-of-study reflection questions, were designed to complement clinical, lifestyle and patient-reported data in WISH by capturing contextual factors that may influence follow-up, healthy behaviours, fatigue management, wellbeing and social participation. Future implementation will assess its feasibility, relevance and added value far patient/centred recommendations.

Keywords: Built environment; breast cancer; prevention; survivorship; digital health; WISH; questionnaire; personalised recommendations; quality of life.

29. THE EXISTENCE OF PURI IN BALI AS A FORM OF SUSTAINABLE CULTURAL INFRASTRUCTURE AND ARCHITECTURAL SPACE

Abstract

"Puri" is one of the architectural form of traditional house in Bali, in the form of complex of building which function as center of government and residence of king and its family. 'Puri' represents an architectural quality that uniquely corresponds to a particular function, form and time. Its representation embraces the grandeur of scale and aesthetic and decorative elements. Along the way of history, this form of living, which specifically accommodates the activities of noble families / empires and its components, is struggling to meet the high cost of regular maintenance. As a result, there has been a change of spatial and architectural formation of various 'puri'. The developments that occur are certainly not limited to physical changes, but also to the philosophical meaning of spaces and buildings. The research is aimed to reveal the various aspects that change the existence of the architectural form of the castle. Assessments are conducted by observing progress / progressive changes of a form through adjustment efforts that are restricted to both external and internal factors. The conclusions of the research are ‘puri' in Bali currently does not function as the center of government and is no longer supported by the community. Thus, the prevailing general view is that the physical building of 'puri' is only a historical heritage of the past. Currently the Balinese people have not much to know the meaning attached to the complex 'puri'.

Keywords: Kingdom in Bali, Puri, Sustainable, Cultural Infrastructure Author: A. A. Gde Djaja Bharuna S.1, Anak Agung Ngurah Aritama2, I Ketut Mudra3 Affiliation: 1, 2, 3 Department of Architecture, Faculty of Engineering, Udayana University INTRODUCTION Puri represents a style of Balinese architecture characterised by a complex of structures that functions as a governmental seat and the domicile of a monarch and their family. For the Balinese people, a puri is perceived as the dwelling of the Ksatrya, the governing elite, or the abode of a revered local aristocrat (Gelebet, 1986:36-37). The puri functions as a palace, embodying a comprehensive architectural design that integrates spatial and structural organization, including parhyangan (worship spaces), pawongan (living areas), and palemahan (functional zones), all meticulously arranged in a cohesive manner (Rumawan, 1993:2-3). Puri, like other royal palaces and castles around the world, has distinct traits that have evolved over time to reflect shifting eras. Only a limited number of such palaces endure on the island of Bali today; some have deteriorated, been moved, or remain unrenovated, while others are meticulously maintained. The royal residences/puri and notable edifices in Bali predominantly originate from the 17th to 19th centuries AD. During this time, the island was ruled by a number of small kingdoms, and conflicts arose often between smaller realms. These battles not only caused the collapse of many kingdoms, but also resulted in the demolition of royal palaces by opposing forces. By the late nineteenth century, several kingdoms had fallen, either as a result of inter-kingdom fighting or Dutch invasions. This damage continued until the Dutch seized the majority of Bali in the early 2 twentieth century, destroying and razing several palaces belonging to both peaceful and still- independent kingdoms (Ketut Agung 1991:126-130). Due to successive conflicts and the kingdoms' declining authority, only a few palace structures in Bali exist intact today. They include Puri Gianyar, Puri Karangasem, Puri Amlapura (in Karangasem), and Puri Ubud. The latter two are modest palaces that historically housed kings. Meanwhile, just the front section of Puri Klungkung survives, and it is now known as Taman Kertagosa. The architectural form of the puri (royal palace) has been impacted by the evolution and lengthy history of the Balinese royal authority structure, which has been shaped by both internal (such as power transfers or rebellions) and foreign (such as conquest or colonisation). Changes have also been influenced by causes such as an increase in the number of tenants, economic considerations, and evolving public opinions of the puri's existence. There are at least two variables that underlie this research, according to numerous studies and investigations: 1) Balinese puri, or royal palace complexes, no longer serve as centers of government or are sustained by a society that operates under a monarchical system; as a result, the general consensus is that these physical structures are merely historical relics of the past; and 2) modern Balinese society is largely ignorant of

the meanings that may be inherent in a puri complex. This study focuses mostly on the evolution of architectural forms and how the underlying philosophical concepts adapt to the changes that occur. While there are studies on Balinese puri (palaces) and their architecture, none have comprehensively addressed their existence and the transformations of their architectural forms from the perspective of historical development and its relationship to the associated systems of authority. The study begins by looking at forms that represent specific concepts, essentially assessing layout, building design, function, and other physical features. A secondary research goal is to elucidate the many factors direct or indirect that have influenced the evolution of puri architectural forms. This study adopts a qualitative research strategy based on the historical materialism approach. The study employs a naturalistic qualitative paradigm in which the subject stays unaltered by experimental manipulation. The study investigates architectural form by monitoring gradual morphological changes caused by adaptive processes constrained by both external and internal causes. Furthermore, the philosophical significance of the puri (palace complex) is examined in relation to the dominant authority systems and the community's socio-cultural context, with a focus on tracing these developments throughout time. RESEARCH METHOD A qualitative technique is used because the main focus of this research is quality; it is naturalistic, contextual, and descriptive, emphasising a *emic* perspective and a process-oriented character. It is holistic, interpretive, and subjective, expressed through in-depth narratives; it is based on direct, purposeful data and employs inductive analysis throughout the research process-with the researcher acting as the primary instrument. In the end, the qualitative method offers very detailed advice about the study results (Ibrahim, 2005:53-54). As a result, the historical materialism method is used in this study. According to this approach, the research must accurately, thoroughly, and clearly depict the reality of the puri (palaces) being 3 studied; it must be based on observable facts (what is seen and heard) without fabrication or manipulation. Though theoretical generalisations are still possible, the research tries to expose phenomena rich in meaning rather than making sweeping generalisations. Even if a very modest sample size is needed, it is anticipated to capture and depict a complicated reality. Samples will be chosen for this study using a random purposive sapling technique that is thought to be representative. This research is designated as a'single-case' study, therefore it requires a research site that can demonstrate a variety of typologies about the architectural alteration of puri (palace complexes), as well as the history of their roles and underlying meanings. The choice of the puri site may reveal phenomena and issues that contradict existing ideas; therefore, the theory developed in this study is expected to refine, supplement, or perfect those theories. The data to be collected can be divided into two categories: primary and secondary. Primary data will be gathered through field observations or surveys, specifically by investigating the puri (palace) complex, conducting physical inventories, and mapping and measuring the complex and its structures in their current state. The researcher will personally conduct the interviews, starting with open-ended sessions to acquire preliminary information about the puri's architectural form, functions, and philosophical importance. To gain a more complete understanding of the challenges, interviews will be undertaken with other informants representing various levels of experience and competency, such as undagi (traditional master builders), sulinggih (high priests), and architects. In general, the data for the proposed study will be analysed using grounded theory. This method comprises an investigation that goes beyond simply acquiring an overview or comprehension of the reality or social phenomenon being studied; its goal is to discover, augment, or, at the very least, refine a theory. The analytical results will be presented using both formal and informal ways, with a descriptive method comprising narratives interpreted based on an assessment of the gathered data. LITERATURE OVERVIEW

30. THE HUMAN IN MYTHOLOGICAL SPACE: BETWEEN THE FIGURATIVE AND THE ABSTRACT

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Abstract

Background: Mythological space has a unique role in human culture, situated between the sensory perception, which is pragmatic and perceptual, and the pure cognition, which is imagined and abstract. It realizes itself on a symbolic level, playing a crucial role in the overall symbolic exchange among people. This space delineates a fundamental ontological dichotomy and establishes the logic of identity. Furthermore, mythological space reflects the fundamental human need for identification and orientation. Purpose of Study: The paper studies the mythological space that holds a specific and functional place in human culture, where patterns of behaviour, connection, communication, and symbolic exchange among people are crucial as they reflect the mythological aspects of human existence. This research provides a theoretical overview of the processes involved in communication and symbolic exchange between humans and architectural space. Methods: The paper utilizes qualitative research based on a descriptive theoretical review, to examine the concept of space within mythical consciousness. The study focuses on communication patterns and symbolic exchanges related to human behaviour, exploring both its collective phylogenesis and individual ontogenesis. The structure of mythological images is traced through a sequence of basic elements and mythemes, as well as the operations involved in their structuring. Main Argument: The study argues that mythological thought represents a set of ethical values, which, in a series of transformations, acquire spatiality. First, they are reduced to relations, that is, energies, and then they form patterns, which further become spatial patterns, and as such, become space. The patterns provide conceptuality and permanence to the architectural space. Conclusions: Following the research on mythological images by various authors (for various socio-cultural formations and civilizational circles) the paper concludes that the morphology of mythological images is based on a certain number of value principles, which are formalized as patterns, and further as spatial patterns.

Keywords: Myth, mythological images, mythological space, patterns, spatial patterns, morphology.
Introduction Mythological thought represents one of the earliest forms of human cognition through which people organize reality, establish systems of values, and create meaningful relationships with the world. Situated between sensory perception and abstract cognition, mythological consciousness transforms individual experience into symbolic representations that shape collective identity, communication and orientation. Within this symbolic framework, space is not understood merely as a physical entity but as a meaningful construct formed through symbolic patterns and cultural values. The purpose of this research is to provide a theoretical review of the phenomenology of architectural interior space and the symbolic patterns of human behaviour, with particular emphasis on the role of mythological thought in the formation of spatial meaning. The study examines how ethical values embodied

31. Visual Connectivity as a Mediator between Active Frontage and Social Interaction in an Urban Commercial Corridor: Evidence from Blok M, Jakarta

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Abstract

Urban commercial corridors play a crucial role in promoting social sustainability by providing public spaces that encourage pedestrian activity and social interaction. While previous studies have established that active frontage contributes to urban vitality, the mechanism through which physical frontage characteristics influence social interaction remains insufficiently understood. This study investigates the direct effect of Active Frontage on Social Interaction and examines the mediating role of Visual Connectivity in an urban commercial corridor. A quantitative cross-sectional survey was conducted in the Blok M commercial corridor, South Jakarta, involving 84 respondents selected through field-based questionnaires. Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4, which is suitable for exploratory models with relatively small sample sizes and formative measurement constructs. The findings indicate that Active Frontage has a significant positive effect on Visual Connectivity, while Visual Connectivity significantly enhances Social Interaction. In contrast, the direct relationship between Active Frontage and Social Interaction is not statistically significant. Mediation analysis demonstrates that Visual Connectivity fully mediates the relationship between Active Frontage and Social Interaction (indirect-only mediation, VAF = 67.19%), indicating that physical frontage characteristics foster social interaction primarily by improving visual accessibility, transparency, and perceived spatial openness. These findings suggest that Visual Connectivity functions as the key behavioral mechanism linking built form characteristics to social outcomes in commercial streets. The study contributes to urban design theory by extending the understanding of Active Frontage beyond its physical attributes and highlighting the importance of visual permeability in supporting socially sustainable public spaces. The results also provide practical guidance for planners and designers to prioritize transparent façades, visually permeable ground floors, and pedestrian oriented street environments in the revitalization of commercial corridors.

32. Evaluation of Room Thermal Comfort in Colonial Heritage Buildings at Dr. Radjiman Wediodiningrat Mental Hospital

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Abstract

Knowing that Indonesia has a humid tropical climate, mental hospitals must pay extra attention to the physical condition of the building to provide thermal comfort to patients for obtaining comfort in their souls in the form of a sense of calm, security and happiness. This research aims to determine the level of thermal comfort in the Dr Radjiman Wediodiningrat Mental Hospital building based on the roof shape and roof material. This research uses observational data collection carried out directly in the field, the data collection technique uses gradual data collection using a time interval and compares it with the Indonesian Standard of SNI T-14-1993-03. The research results show that the variable values of air temperature, humidity and wind speed are influenced by the physical condition of the building. The research results show that the total temperature measurement results at the hospital meets the standard with a total room sample of 66.6% followed by the relative air humidity value which also meets the standard with the value of 98%. As of wind speed research at the hospital tends to have no significant values, according to SNI T-14-1993-03 all measurement values are at the standard level, which means the influence of roof shape and material is not significant in influencing wind speed.

33. Evaluation of a Hauling Truck Productivity Model for Estimating Fuel Use and Emissions from Earthwork Activities

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Abstract

Heavy-duty diesel (HDD) equipment is essential for supporting infrastructure construction activities across the United States. Despite its importance, this machinery consumes large volumes of diesel fuel and generates considerable emissions, including nitrogen oxides (NOx), particulate matters (PM), hydrocarbons (HC), carbon monoxide (CO), and carbon dioxide (CO2). Because pollutant emissions are closely related to fuel usage, and fuel usage is affected by equipment efficiency, reliable estimation approaches are necessary. This study proposes a methodology and computational tool for predicting fuel consumption and emissions from HDD equipment by considering operational productivity rates. The approach combines multiple linear regression (MLR) techniques for productivity prediction with the EPA NONRAD model. Productivity data for hauling trucks were deployed using information obtained from RSMeans Heavy Construction Cost data. Emission factors provided by the NONROAD model were subsequently applied to estimate both fuel use and pollutant generation. To evaluate the approach, a case study of a hauling truck involved in earthmoving operations was conducted together with a sensitivity analysis. The findings demonstrate that the developed productivity model achieves strong accuracy and precision while maintaining very low bias. As a result, the model offers a dependent framework for estimating fuel requirements and forecasting pollutant emission in construction projects.

34. Analysis of conditions on the private rental market in selected urban municipalities

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Abstract

In Slovenia, housing affordability has become one of the most pressing social and economic challenges of recent years, with the private rental market playing an increasingly important role in meeting the population's housing needs. Despite its growing significance, the private rental market has historically lacked systematic and methodologically consistent monitoring, and the completeness and accuracy of the official Real Estate Market Register (ETN) have long been questioned. Against this backdrop, the Urban Planning Institute of the Republic of Slovenia conducted the research project Analysis of Conditions on the Private Rental Market, commissioned by the Ministry for Solidary Future. The study focused on the ten largest urban municipalities in Slovenia and pursued two aims: to systematically analyse rental market conditions in these municipalities, and to compare official ETN data with advertised data from the private rental market. Advertised data were collected through systematic daily monitoring of listings on nepremicnine.net, covering dwelling type, floor area, furnishing, rent and other attributes, while ETN transaction data were subjected to a rigorous suitability assessment before comparison. The results show substantial and systematic differences between the two data sources: officially recorded ETN rents never reached 80% of advertised market rents in any of the ten municipalities. The findings highlight the scale of informal rental activity in Slovenia and underscore the need for a permanent public database of advertised private rental data to support more effective, evidence-based housing, spatial and fiscal policy.

35. Reasons for vacancy and partial occupancy of single-family homes

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Abstract

The underutilisation of single-family homes, expressed through vacancy and partial occupancy, represents an increasingly important housing-policy challenge in Slovenia, despite persistent shortages of affordable housing. This paper aims to identify the key drivers of vacancy and partial occupancy of single- family homes and to develop a typology of owners based on the circumstances and motivations underlying the underutilisation of their properties. The analysis shows that housing underutilisation results from the interaction of demographic change, socioeconomic conditions, physical characteristics of the housing stock, housing-market dynamics, and policy factors. A distinction is made between owners facing objective constraints and those whose properties remain underutilised as a result of deliberate decisions. The findings highlight that vacant and partially occupied homes are not a homogeneous resource and therefore require differentiated policy responses. Future research will empirically test the proposed typology among owners and examine the perspectives of housing seekers in order to assess the practical potential of different measures for activating underutilised housing stock.

36. Developing Response Scenarios for Coastal Climate Adaptation through Multi-Layer Imaginaries Workshops: The Indonesia Living Lab

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Abstract

Climate-risk assessments can identify future hazards and exposed systems, but translating this evidence into locally meaningful adaptation responses remains challenging. This paper develops a multi-layer imaginaries workshop framework for constructing response scenarios for climate-vulnerable coastal communities. A staged workshop process moves from identifying risks and their interactions to examining critical functions, local perceptions, social and environmental imperatives, available opportunities and alternative future pathways. Three interconnected workshop layers engage multidisciplinary researchers, institutional and technical stakeholders, and local residents. Each works from a common evidence base but uses communication formats and prompts appropriate to its knowledge and decision-making role: researchers test systemic and technical plausibility, institutional actors examine governance, funding and maintenance feasibility, and residents assess lived relevance, local opportunities and social acceptability. Outputs are compared for convergence, complementarity, disagreement and missing knowledge before being synthesised into response scenarios. A response scenario is understood not as a masterplan or project proposal, but as a coherent future pathway that combines locally available opportunities with adaptation actions, stakeholder roles, enabling conditions and uncertainties. Developed through an Indonesian coastal Living Lab, the framework demonstrates how successive imaginaries workshops can connect scientific risk assessment with participatory future-making and implementation- oriented adaptation planning while avoiding premature commitment to a single technical solution.

37. Homeowners' attitudes toward models for activating vacant and partially occupied single-family homes

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Abstract

This paper examines homeowners' attitudes toward models for activating vacant and partially occupied single-family homes in Slovenia, where high levels of private homeownership, a large stock of oversized family houses and demographic change have created an important but weakly mobilised housing reserve. The problem is not only physical vacancy or under-occupancy, but also the emotional, legal, financial and planning-related barriers that make owners reluctant to sell, rent or adapt houses built as family homes and often understood as intergenerational heritage. The aim of the paper is to identify which activation models owners find acceptable and under what conditions such models could contribute to housing accessibility while respecting attachment to home and local community. The analysis is based on activation models developed for the Slovenian legal, spatial and social context and on twenty-four semi-structured interviews with owners of vacant and partially occupied single-family homes. The findings show that the most acceptable option is the internal subdivision of a house into two dwelling units, with the owner remaining in one unit and the second let on a long-term basis through a trusted public or municipal organisation, preferably with renovation support and safeguards such as tenant screening, rent guarantees and professional management. They also show that unresolved co- ownership, fear of tenants, renovation costs and restrictive municipal spatial plans are central barriers, whereas vacancy taxation is received ambivalently and specialised social uses appeal only to a smaller segment of owners. The paper concludes that activating this stock requires not a single instrument, but a graduated set of models centred on subdivision, organisation-mediated letting, renovation support, simplified legal procedures for co-owned houses and targeted changes to spatial-planning regulation.

38. Incentives for homeowners to activate vacant or underutilized residential spaces

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Abstract

This paper examines incentives for activating vacant and underutilized residential spaces, particularly in Slovenia's stock of older single-family houses. It addresses the paradox of growing housing affordability problems alongside a substantial number of vacant or partially occupied dwellings. The aim is to identify which policy instruments are most suitable for encouraging homeowners to activate these spaces and how they can be combined into an effective policy framework. Drawing on a comparative review of Slovenian and international practices, the analysis examines regulatory measures, financial incentives, intermediary and advisory organisations, and community-based housing models. The findings indicate that the greatest potential lies in combining targeted renovation support, secure rental arrangements, vacancy management measures and specialised intermediary organisations that reduce homeowners' risks and administrative burdens. The paper concludes that Slovenia should develop an integrated activation strategy centred on trusted intermediary support, conditional financial incentives and complementary regulatory and community- based measures, while further testing these approaches through pilot projects and empirical research.

39. A Risk Screening Approach to Environmental Vulnerability in Indonesian Tropical Cities

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Abstract

This study begins from a preliminary observation in central Jakarta, where the Mahoney classification drifted from a stable G4 pattern toward a mix of G3 and G4 months, an early sign that urban thermal regimes are shifting in ways simple averages miss. Building on that signal, I develop a risk screening framework to identify the Indonesian provinces most exposed to concurrent environmental and climatic stress. The framework integrates three official data streams from Statistics Indonesia: population density to 2021, the Environmental Quality Index (IKLH) for 2019 to 2023, and its component scores for air, water, land cover, peat, and coastal conditions. Rather than reduce each province to one number, the method profiles demographic pressure, current environmental state, and recent trajectory. Provinces stressed on all three are prioritized for follow up Mahoney analysis at their capitals, where the table is repurposed as a classification instrument that reads regime change through rising G3 prevalence, declining relative humidity, and climbing maximum dry bulb temperature. Combining the two tracks yields a risk typology of compound high risk, latent risk, and an environmental decline pathway. The study makes no causal claim; it maps where environmental vulnerability, and emerging climate signals intersect.

40. Spatial Configuration Patterns of Commercial Establishments Along Local Streets in Ubud Cultural Tourism Area

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Abstract

The growth of tourism in Ubud, Bali, has intensified the insertion of commercial activities into traditional Balinese residential compounds, producing hybrid residential-commercial environments. While previous studies have documented tourism-driven physical and functional transformations, limited attention has been given to how commercial building typologies are spatially accommodated within the hierarchical organization of traditional Balinese residential compounds. This study investigates the relationship between commercial building typology and spatial configuration within traditional residential compounds along Goutama Street and Goutama Selatan Street, Ubud. A descriptive qualitative approach combines typomorphological analysis with Space Syntax using Justified Plan Graph (JPG) analysis. Data were collected through field observation, spatial documentation, and mapping of 39 residential plots containing 223 commercial functions. Five commercial building typologies were identified and synthesized into three recurring typology-configuration groups based on their spatial location, configurational depth, and sequence of access. Kiosks and pods generally occupy the street frontage and outer Palemahan with shallow configurations, while larger row buildings and street-edge single buildings can extend further into the plot while maintaining direct street access. Plot-interior single buildings and compound developments exhibit deeper configurations, with commercial functions reached through Angkul-angkul and transitional spaces. Differences between west- and east-side plots further indicate that traditional zoning influences the extent of commercial intervention, with Parahyangan constraining intervention and Pawongan allowing greater spatial adaptation. Commercialization therefore follows recurring typological and configurational strategies, accommodating commercial needs through spatial adaptation and compromise while retaining selected elements of the traditional spatial order.

41. The Evolution of Spatial Configuration in the Intergenerational Growth of Traditional Balinese Houses

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Abstract

Traditional Balinese housing continuously evolves across generations through the addition of building masses, subdivision of plots, and adaptation of spatial functions to accommodate changing family needs. These transformations raise questions about how spatial configuration and traditional values are maintained while adapting to changing functional and social requirements. This research aims to examine how spatial configurations evolve through the intergenerational growth of traditional Balinese housing in Desa Adat Beresela, Gianyar, and to understand how traditional spatial identity is negotiated through this process. The study employs a qualitative approach combining spatial ethnography with Space Syntax analysis using the Justified Plan Graph (JPG) method. Data were collected through field observation, visual documentation, plan mapping, and semi-structured interviews. Analysis involved marginal coding of interview data, JPG analysis of individual housing clusters, and synthesis of ethnographic and configurational findings to interpret the evolution of the housing system. The findings indicate that spatial elements can be broadly categorized as maintained, transformed or simplified, and lost. The Pawongan zone is maintained across clusters, while Parahyangan is maintained at the compound level despite simplification of sacred elements. In contrast, Palemahan is the most flexible zone and is frequently transformed to accommodate new generations. Open spaces, particularly the natah and open merajan, demonstrate high integration, control, and choice, indicating their role as central spaces for movement, activity distribution, and socio-spatial interaction. The evolution of this housing system therefore represents an adaptation to family growth and contemporary needs while maintaining traditional cosmological values, in which spatial hierarchy, sacred orientation, and the centrality of open spaces remain key elements of traditional identity.

42. Sustainability of Sacred Architecture Based on Balinese Culture, Case: Ngenteg Linggih Ritual

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Abstract

Balinese sacred architecture represents a living cultural heritage whose sustainability is maintained not only through physical conservation but also through ritual continuity and communal participation. This study examines the Ngenteg Linggih ritual as a cultural mechanism for sustaining sacred architecture based on Balinese culture, with particular emphasis on the production and reactivation of sacred space. Using a qualitative interpretative case-study approach, the research applies the Saraswati Method, particularly the Pleasure of Aesthetic of Place framework, to interpret ritual experience through visual, auditory, tactile, olfactory, and gustatory dimensions. The findings show that Ngenteg Linggih function as a ritual process that transforms rehabilitated or renewed architectural structures into spiritually legitimate sacred space. Through purification, consecration, offering, sacred sound, incense, holy water, bodily movement, and collective prayer, architecture is not merely preserved as a material object but continuously reactivated as a living sacred spatial system. The ritual also sustains cultural memory, embodied practice, communal responsibility, and the transmission of traditional architectural knowledge among undagi and craftmen, this study argues that the sustainability of Balinese sacred architecture should be understood as the continuity of sacred space trough ritual spatialization, multisensory experience, cultural memory, and social participation.

43. When Infrastructure Fails, Mobility Prevails: Assessing Illegal Dumping Dynamics in Denpasar Bali

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Abstract

The shutdown of the Suwung Landfill - Bali's largest and longest- running final waste disposal facility - has triggered a substantial urban waste management crisis in Denpasar, Indonesia. After the Indonesian Ministry of Environment banned any further waste disposal at the site, the lack of feasible alternative disposal infrastructure has resulted in extensive illegal dumping of household waste on public streets and in open areas. Although prior scholarship has examined illegal dumping through frameworks of behavioral change, social norms, and regulatory enforcement, the spatial and infrastructural processes underlying this behavior have not been adequately investigated. This research adopts a qualitative case study design to examine the behavioral and spatial dynamics of illegal dumping in 32 documented cases across South Denpasar. Data were gathered via participant observation, physical site surveys, and informal interviews carried out by a researcher who was embedded in the study area as a permanent resident. The findings indicate that conventional environmental deterrents have only a minimal effect on dumping behavior when residents cannot access functioning waste collection services. Rather, four principal spatial and behavioral mechanisms were identified: (1) the ineffectiveness of surveillance technology amid infrastructure failure; (2) the appropriation of territorially ambiguous or abandoned spaces as de facto disposal sites; (3) the informal use of road and sidewalk space as communal waste staging areas, particularly where vehicular access is limited; and (4) the disproportionate contribution of micro, small, and medium enterprises to roadside waste accumulation, owing to the organic character of their waste and the absence of on-site processing capacity. A fifth finding underscores the erosion of culturally significant spatial boundaries, as waste is increasingly deposited next to sacred Balinese temple structures (sanggah), signaling the breakdown of both civic and cultural norms under conditions of infrastructural stress. The study concludes that illegal dumping in Denpasar stems primarily from systemic infrastructure failure rather than from individual behavioral deficiency.

Keywords: illegal dumping, waste management infrastructure, public space appropriation, Denpasar, Bali, qualitative case study, urban waste governance

44. Children Participation in Sustainable Urban Development: Design of the ByMaker Educational Game

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Abstract

Professional design is essential for transforming educational objectives into an accessible, engaging and meaningful game experience. For children, visual and interaction design is not merely aesthetic: it directly in□luences usability, motivation, emotional engagement and learning outcomes. Clear navigation, recognizable imagery, age-appropriate interactions and consistent visual feedback enable children to understand complex topics and make informed decisions. This study presents ByMaker, a scenario-based educational computer game designed to help children understand the balance between the environmental, economic and social dimensions of sustainability. Its immersive virtual environment uses familiar streets, buildings, landmarks and historical □igures from Trondheim to strengthen children's sense of belonging and encourage critical thinking. Players explore scenarios related to transportation, housing, public space and urban nature, choosing among solutions with different sustainability consequences. The professionally designed user interface uses bright colours, literal icons and visual rather than numerical feedback. Environmental results are represented by the Earth, economic results by a wallet and social results by Olav, a historical □igure associated with Trondheim. Their expressions change according to the player's choices. Classroom testing with children aged 10-12 indicated positive engagement and informed improvements to the game's visual language, usability and feedback mechanisms.

45. Agent or Agency? AI-Enabled Co-Benefit Reasoning for Urban Sustainability in Neighbourhood Transformation

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Abstract

Urban sustainability is often pursued as a technocratic capacity: the ability of municipalities to produce master plans, action plans and indicator frameworks that direct neighbourhood transformation from above. This discussion paper argues that such planning frequently becomes a poor substitute for participation. Because dispersed local knowledge cannot be fully centralised, comprehensive plans tend either to be irrelevant to situated practice or to be realised at a disproportionate social cost, and in doing so they can breed frustration, alienation and conflict rather than informing, engaging and directing local agency. Drawing on systems thinking, planning theory, action science, social sustainability and public value, the paper reframes urban sustainability as a local governance capacity: the capacity to connect context, needs, knowledge, roles and solutions across sectors, with local accountability for community, economy and environment. It then asks what role artificial intelligence should play. The central claim is that agentic AI is valuable not as an optimising agent that re-centralises decisions, but as agency infrastructure that relaxes cognitive constraints and supports collective reasoning about co-benefits and trade-offs. Climate action illustrates the argument, which is then extended to planning and local public provision more generally.

46. Bridging Traditional Values and Spatial Policy: Legal Strategies for Sustainable Governance of the Ayung River Cliffs

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Abstract

The rapid expansion of the tourism industry in Ubud, Bali, has triggered significant land-use conversion along the fragile landscapes of the Ayung River cliffs, threatening both ecological stability and local heritage. While formal environmental laws and spatial policies exist, their enforcement frequently lacks local legitimacy and fails to curb unchecked spatial exploitation. This study investigates the institutional gap between state-driven spatial planning and Balinese indigenous customary law (Awig-awig) in governing river cliff areas. Employing a socio-legal approach, this research utilizes spatial analysis via Geographic Information Systems (GIS) to map zoning compliance and land-use dynamics, combined with in-depth interviews with traditional village leaders (Bendesa Adat) and local government officials. The findings reveal a dualism in spatial control, where indigenous institutions possess strong social legitimacy but lack formal legal integration within regional spatial policies. To address this, the paper proposes collaborative legal strategies to formalize and harmonize traditional values into modern spatial governance. By establishing a co- management institutional framework, this study demonstrates how integrating customary systems into formal legal architectures can prevent further spatial degradation. Ultimately, this approach bridges cultural heritage and future sustainability, offering a viable collaborative solution for building resilient and liveable communities against global tourism pressures.

47. Adaptive Traditional Street Frontage as Capital: Bridging Cultural Resilience and Tourist Experience in Ubud, Bali

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Abstract

Living cultural destinations must balance heritage continuity, tourism pressures, and socio-economic change, yet street frontage is rarely examined where domestic, socio-cultural practice, mobility, and visitor experience are converged. The paper reframes traditional street frontage in Ubud, Bali as adaptive cultural infrastructure that produced cultural capital that not only immersive tourist experiences but also meaningful place for local resident. Using a qualitative approach supported by descriptive-quantitative evidence, the study combines typo-morphological analysis and tourist-resident perceptual inquiry across twelve street corridors expanded by sixty local settlement frontages observed. Findings show that TBF adapts and selectively absorb tourism pressures through layered negotiation guided by hierarchical adaptability that maintain cultural resilience through continuity of sacred-ritual practice, symbolic value, and local legitimation. Thus, it operates through three domains: cultural legibility, adaptive commodification, and community legitimization, with six mechanisms explain this adaptive process: 1) ritual-domestic life continuity, 2) symbolic markers, 3) physical-symbolic hybridization, 4) spatial hierarchy restructuring, 5) genealogical / heritage responsibility, and 6) inclusive integration. The study offers transferable principles for other living cultural destinations where traditional street interfaces under negotiating the tourism pressures while sustainable capital needs on co-producing cultural continuity and distinctive visitor experiences.

Keywords: adaptive heritage, traditional frontage, cultural capital, cultural resilience, tourist experience.

48. Climate-Conscious Material Transformations in a Balinese Palace: Resilience Lessons from Puri Agung Ubud

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Abstract

Puri Agung Ubud, a traditional palace that is still inhabited and actively used, demonstrates how architectural heritage can adapt to the pressures of tourism, social dynamics, and potential disaster risks that are increasingly relevant in the context of climate change. The focus of this paper is on the transformation of materials and construction systems in several bale and key elements of Puri Agung Ubud, particularly in Palebahan Ancak Saji, Palebahan Rangki, Semanggen, and Saren Agung, as a strategy to strengthen structural resilience without losing the character of traditional Balinese architecture. The changes studied include the use of reinforced concrete in the foundation, strengthening the frame structure, adjusting column dimensions, and adapting roof and wall materials that still refer to the Tri Angga concept and the principles of traditional Balinese architecture. The analytical approach relies on material transformation as part of the Theory of Built Environment Transformation and the Theory of Architectural Function, which is then combined with local wisdom such as Tat Twam Asi and the Sanga Mandala pattern.[1] The results of the study indicate that the application of hybrid materials, a combination of traditional structures and modern materials, can increase safety against earthquake loads, intensity of use, and tourism pressure, while maintaining the natah pattern in each palebahan, the presence of corridors to maintain natural air circulation and the con□iguration of the profane sacred space and symbolic expression of the palace. From these practices, lessons are drawn for the development of future settlements in cultural areas: climate- conscious material adaptation needs to be designed as a resilience strategy, not just a technical replacement, while still placing values, spatial patterns, and community participation as the main guide.

Keywords: Climate-Conscious Design, Material Transformation, Architectural Resilience, Puri Agung Ubud, Traditional Balinese Architecture

49. Resolving Density-Performance Trade-off in Tropical Social Housing: A Two-Phase Multi-Objective Optimization Framework for Jakarta's Rusunawa

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Abstract

Tropical megacities increasingly face a dual challenge of housing shortage and rising cooling demand. In hot-humid climates such as Jakarta, social housing developments frequently prioritize unit quantity over environmental performance, resulting in increased cooling dependency and reduced indoor comfort. The Rusunawa (social housing) typology is frequently characterized by high cooling loads and inadequate daylighting due to rigid, intuition-based design standards. This study develops a two-phase multi-objective optimization framework to investigate density-performance trade-offs in tropical social housing. Using Rusunawa Pengadegan in Jakarta as a case study, the framework integrates parametric modeling, NSGA-II evolutionary optimization, and K-means clustering to generate and classify design alternatives. The first phase optimizes building morphology based on residential capacity, cooling Energy Use Intensity (EUI), and Useful Daylight Illuminance (UDI), while the second phase optimizes shading devices. Results demonstrate that the selected configuration increases residential capacity by 15.38%, reduces cooling EUI by 11.91%, and improves daylight performance compared with the baseline condition. The study demonstrates that machine-learning-assisted design exploration can transform social housing development from rule-based replication toward evidence-based climate-responsive decision making. Furthermore, Spearman Correlation Analysis reveals critical non-linear relationships between unit width and cooling loads in the north-south orientation. The study concludes that the integration of unsupervised machine learning with evolutionary search provides a scalable, data-driven methodology for developers and policymakers to align urban real estate efficiency with sustainable green building standards in the Global South.

Keywords: Tropical Social Housing, Multi-objective Optimization, Generative Design, Building Perforance Simulation, Design Decision Space, NSGA-II.

50. Adaptive Passive Cooling Housing Model for Climate-Resilient Tropical Cities: Evidence from Urban Communities in Bali, Indonesia

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Abstract

Rapid urbanization and urban heat intensification are increasing residential cooling demand in tropical cities. This study develops an Adaptive Passive-Cooling Housing Model from a cross-sectional mixed-methods investigation of 125 households across the four administrative districts of Denpasar, Indonesia. Data were obtained through a structured household survey, systematic building and neighborhood observations, and thematic analysis of open-ended responses. Overall, 67% of respondents perceived their dwellings as hot or very hot, particularly during midday and late-afternoon periods. Natural ventilation (70%) and electric fans (63%) were the most frequently reported adaptation practices, while 60% of households owned air-conditioning equipment. Among AC users, 65% used conventional or non-inverter units, and 72% operated AC for at least four hours per day. Triangulated evidence recurrently associated unfavorable thermal perceptions with ineffective cross-ventilation, inadequate external shading, exposed or heat-retaining roof and wall systems, limited vegetation, and restricted neighborhood airflow. The adoption of more comprehensive cooling improvements was constrained by upfront costs, limited technical knowledge, tenure and spatial restrictions, and insufficient institutional support. The proposed model integrates five components: climate-responsive building design, urban ecological enhancement, behavioral adaptation, policy and institutional support, and efficient residual mechanical cooling. It provides differentiated implementation pathways for lower-income landed housing, middle-income households, and vertical housing. The findings support a passive-first hybrid-cooling strategy that reduces avoidable heat gain while retaining access to efficient mechanical cooling when passive measures are insufficient.

Keywords: passive cooling; adaptive thermal comfort; climate-resilient housing; residential cooling; urban heat; tropical cities; Denpasar

51. Space Syntax for Inclusive Mobility: Movement Patterns Analysis of People with Blindness

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Abstract

Blind individuals represent one of the disability groups most affected when urban environments fail to meet accessibility needs. Their limited visual capacity makes understanding their movement logic essential in designing inclusive built environments. One potential analytical approach is space syntax, a well-established predictor of human movement. However, research applying space syntax to examine the mobility patterns of blind users remain limited. This study aims to investigate whether the movement logic predicted by space syntax is also applicable to totally blind individuals. Data were collected from totally blind residents of Sentra Wyata Guna Bandung who independently determined the routes they travelled, either individually or when leading group movements, through observation, interviews, and manual route tracking (shadowing). Using a small exploratory qualitative case study approach, the observed movement patterns were synthesized with the integration, connectivity, and choice values derived from Space Syntax analysis to examine the correspondence between spatial configuration and route selection. The findings indicate that, in general, the observed mobility patterns show a visual correspondence with the integration measure of space syntax, whereas connectivity and choice values show no clear correspondence with observed route selection. Additional factors influencing route selection include the availability of guiding blocks, the quality of spatial settings, and the preference for distance-efficient routes. These results highlight the potential of space syntax as a tool to support inclusive built-environment planning and offer valuable insights for policymakers seeking to foster more accessible urban contexts.

52. Space Syntax Analysis of Disability Movement at Pusat Pelayanan Sosial Griya Harapan Difabel

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Abstract

Persons with disabilities have different mobility characteristics, spatial orientations, and environmental needs according to their types of disabilities, causing mobility behavior within a space to vary. The Pusat Pelayanan Sosial Griya Harapan Difabel (PPSGHD) in Cimahi accommodates individuals with various types of disabilities within a shared spatial setting through structured daily activities and social rehabilitation programs. However, studies related to disability generally focus on physical accessibility and inclusive design, while research discussing the relationship between spatial con□iguration and movement patterns of persons with disabilities remains limited. Therefore, this study aims to analyze the relationship between movement patterns of persons with disabilities, physical setting, and spatial con□iguration using the space syntax approach. This study employed a qualitative descriptive approach involving seven respondents, comprising one person with physical disabilities, three with visual disabilities, and three with intellectual disabilities. Data were collected through □ield observation, shadowing, interviews, movement mapping, and Space Syntax analysis. During the observation, each respondent was individually followed throughout their daily activities to record movement trajectories, route selection, and navigation behavior. The movement maps were subsequently overlaid with Space Syntax measures (connectivity, integration, and choice) to examine the relationship between observed movement patterns and spatial con□iguration. The results of the study indicate that there is a relationship between movement patterns, the physical setting of the area, and the spatial con□iguration within PPSGHD. However, these in□luences vary among disability groups due to differences in needs and limitations. Person with physical disabilities move based on spatial and social factor, while the movement patterns of persons with intellectual disabilities are shaped by optional activities and social factor. Meanwhile, persons with visual disabilities tend to move based on necessary and spatial factors. The movement of persons with disabilities is in□luenced by considerations related to spatial con□iguration, individual limitations, and social relationships.

53. Bridging BIM and Green Building through Project Delivery Systems: A Strategic Framework for Green- BIM Adoption in Indonesia

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Abstract

Green Building (GB) implementation has become a strategic priority for reducing the environmental impacts of the construction sector and is mandated in Indonesia through Minister of Public Works and Housing Regulation No. 21/2021. However, its implementation remains inconsistent due to technical, organizational, and regulatory challenges. Building Information Modeling (BIM) has been widely promoted to improve project efficiency and collaboration, while the concept of Green-BIM offers opportunities to integrate BIM with Green Building objectives. Nevertheless, a lack of strategic frameworks linking BIM capabilities with Project Delivery Systems (PDS) continues to limit Green-BIM adoption in practice. This study aims to develop a strategic framework for Green- BIM adoption in Indonesia by examining the relationships among BIM, Green Building, and PDS, evaluating current implementation practices, and identifying priority strategies for improving Green Building delivery. A qualitative mixed- method approach was employed through literature synthesis, stakeholder surveys, expert validation, and process mapping. The findings were synthesized into a strategic framework and validated by industry experts. The results indicate that BIM supports Green Building implementation primarily through process enhancement and project integration rather than technological capabilities alone. Major barriers include limited team competencies, inadequate practical experience, low technology adoption, and weak regulatory support. The assessment reveals that technology is the most mature dimension of Green-BIM implementation, whereas policy and governance remain the least developed. BIM is estimated to address approximately 65% of identified Green Building implementation challenges when supported by improvements in technology, process integration, and governance. Expert validation further identifies coordination and integration services as the most critical BIM capability, while contractual and regulatory mechanisms are the key PDS components requiring enhancement. A multi-level Green-BIM framework is proposed, encompassing macro (policy), meso (organizational coordination), and micro (individual competency) strategies. The framework provides a practical pathway for accelerating Green-BIM adoption and strengthening Green Building delivery in Indonesia.

54. Socio-Demographic Determinants of Timber Adoption Toward Low-Carbon Residential Architecture in Indonesia

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Abstract

Timber may offer a lower-carbon option for residential construction in Indonesia, but the factors shaping its adoption are not yet well understood. This study investigates the relationships among socio-demographic characteristics, interest in adopting timber, and the positive and negative reasons people associate with its use. Data came from a quantitative survey of 214 respondents, which gathered socio-demographic information, Likert-scale ratings of interest, and open-ended responses about timber use. Content analysis produced 380 observations of positive reasons in ten categories and 282 observations of negative reasons in eight categories. To assess relationships among the variables, the study applied one-way ANOVA and Pearson Chi-Square contingency analyses. Overall, respondents showed high interest in adopting timber, while socio- demographic characteristics had limited influence. Occupational field was significantly related to the distribution of positive reasons; negative concerns, by contrast, were broadly shared across socio-demographic groups. Interest levels did not differ significantly between the positive and negative reason categories, nor was a significant association found between those reasons. Taken together, the findings indicate that respondents are generally favourable toward adopting timber, while socio-demographic characteristics account for little variation in their perceptions. Broader adoption may benefit from communication that addresses shared concerns, alongside more targeted approaches suited to different educational and professional contexts.

55. Empirical Environmental Performance Evaluation of a Photobioreactor Façade Prototype in a Tropical Office Building

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Abstract

Photobioreactor (PBR) façades have emerged as a promising bio-responsive building 17 envelope technology capable of supporting microalgae cultivation while improving building 18 environmental performance. However, most existing studies rely on simulations or laboratory 19 experiments, and empirical evidence from real operating conditions remains limited, 20 particularly in tropical climates. This study evaluates the environmental performance of a PBR 21 façade prototype installed in a tropical office building and investigates the relationship between 22 microalgal biomass concentration and light transmission through the reactor. An empirical 23 monitoring approach was employed over a 19-day observation period. Indoor and outdoor 24 environmental parameters, including air temperature, relative humidity, light intensity, and dew 25 point, were continuously recorded using data loggers. In parallel, microalgae culture 26 performance was monitored through optical density (OD) measurements to assess the influence 27 of biomass concentration on the façade's optical behavior. The results demonstrate that the PBR 28 façade contributed to a more moderated indoor environment compared with outdoor conditions. 29 Indoor temperatures were lower and exhibited reduced fluctuations, while daylight penetration 30 was significantly regulated through the façade system. Relative humidity levels indoors 31 remained more stable, indicating the formation of a more controlled microclimate. Optical 32 density measurements further revealed the dynamic relationship between microalgal growth 33 and light transmission, highlighting the façade's capacity to function as both a biological 34 cultivation system and an adaptive environmental filter. The findings provide empirical 35 evidence that PBR-integrated façades can improve indoor environmental conditions while 36 simultaneously supporting productive biological processes. The study contributes to the 37 growing body of knowledge on algae-based building technologies and demonstrates their 38 potential as climate-responsive and low-carbon design solutions for tropical regions. The results 39 also support the broader integration of bio-responsive façade systems into sustainable building 40 design and future green building strategies. 41 42

Keywords: Photobioreactor Façade; Building Envelope; Tropical Architecture; Environmental 43 Performance; Sustainable Buildings; Bio-Responsive Architecture. 44 45

56. From Institutional Mental Health Care to Inclusive Community Living: The Role of the Built Environment, Social Infrastructure and Digital Innovation

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Abstract

Mental health is increasingly recognized as a critical dimension of sustainable development, healthy cities, and inclusive environments. The transition from institutional to community-based mental health care has transformed service delivery by promoting autonomy, social participation and independent living. However, successful deinstitutionalization requires more than healthcare reform alone; it also depends on the quality of the built environment and the availability of integrated community support systems. This paper presents a systematic literature review of 47 international studies examining the outcomes, bene□its, and challenges of community-based mental health care, reinterpreting the □indings through the perspective of the built environment. The review demonstrates that accessible housing, inclusive neighbourhoods, barrier-free transport, community infrastructure, and coordinated health and social services are fundamental for enabling recovery, reducing social exclusion, and supporting independent living. It further highlights the growing contribution of digital and immersive technologies, including telemedicine, virtual reality, augmented reality, and remote monitoring, in improving access to personalized care, strengthening community integration, and enhancing continuity of mental health services. The □indings suggest that successful community-based care requires an integrated ecosystem that combines healthcare, housing, spatial planning, social infrastructure, and digital innovation rather than relying on healthcare services alone. Based on these □indings, the paper proposes a built environment perspective for community mental health that positions architects, urban planners, healthcare professionals, municipalities, and policymakers as collaborative actors in creating healthier, more inclusive, and resilient communities. The paper contributes to current discussions on the role of the built environment in supporting equitable, person-centred mental health care and sustainable community development.

57. Philippines Residential Buildings: Now and then!

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Abstract

Buildings account for large shares of global material and energy use. The extraction and use of these resources contribute to climate change, pollution, resource depletion, and biodiversity loss. In the Global South, rapid population growth and urbanization is increasing the demand for new construction. In the Philippines, this challenge is compounded by high exposure to natural hazards and a predominantly self-built construction sector, highlighting the need to better understand resource use in existing and future residential buildings. This study investigates prevalent residential building archetypes in the Philippines to assess their material composition and intensity. A parameterized modelling approach is used to capture uncertainties arising from self-built practices and variations in building design. Key parameters include component dimensions, material composition (e.g., cement content in concrete blocks), and structural characteristics. Archetypes are modelled using Rhino-Grasshopper, and the resulting material intensity and composition data are integrated into mini-RECC, an open-source material □low analysis (MFA) model. Using mini-RECC, we assess future material demand □lows and associated greenhouse gas (GHG) emissions driven by population growth, □loor area per capita, and building lifetime assumptions. Preliminary results indicate greater variation in material intensity among small, detached houses than among larger or multi-story building archetypes. Under a business-as-usual future scenario, demand for concrete- and cement-based materials increases substantially toward 2060, leading to a corresponding rise in GHG emissions. The □indings provide a basis for evaluating material-ef□iciency strategies, energy demand scenarios, and emission reduction pathways for the Philippine residential sector, while supporting the provision of adequate housing for a growing population.

58. Revisiting Bale Banjar: Local Genius and Sustainable Built Environment Practices in Bali, Indonesia

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Abstract

Amidst the increasing attention to sustainable development in the built environment, local genius is increasingly recognized as a learning resource for creating adaptive, contextual, and sustainable environments. One manifestation of Balinese local knowledge is the Bale Banjar, a traditional communal space that serves as a center for social, cultural, and community activities. This study aims to identify the sustainability principles embodied in the Bale Banjar and its relevance to the concept of a sustainable built environment. The method used is a descriptive qualitative approach through literature studies and analysis of the spatial, architectural, and socio-cultural characteristics of the Bale Banjar. The analysis is conducted based on the dimensions of environmental, social, cultural, and economic sustainability. The results show that the Bale Banjar applies passive design principles through open spaces, cross-ventilation, natural lighting, and the use of local materials that are appropriate to Bali's tropical climate. In addition, the Bale Banjar plays an important role in strengthening social cohesion, supporting cultural preservation, and encouraging community-based space management. These findings indicate that the Bale Banjar not only has cultural value but also represents sustainable built environment practices that have developed over generations. Therefore, the principles embodied in Bale Banjar can serve as a reference in developing a sustainable built environment with local identity.

Keywords: Bale Banjar, local genius, sustainability, built environment, Balinese architecture.

59. Ageing in Place: A Study of Barriers to Housing, Transport, and Access for Older Populations in Denpasar, Indonesia

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Abstract

The global population is ageing rapidly, with Asia experiencing one of the most significant demographic shifts. 'Ageing in place'-the ability to live independently in one's own home and community-is a policy priority across the region. However, rapid urbanization, informal settlement structures, and varying degrees of infrastructure development create distinct barriers for older populations in different Asian cities. This research proposes a qualitative study to investigate the barriers to ageing in place in distinct Asian urban contexts: Denpasar, Indonesia, a rapidly developing city in a lower-middle-income country with a strong informal sector. Employing a case study design, the research will utilize semi-structured interviews and focus group discussions with older residents (aged 60+) in selected neighbourhoods of Denpasar. Thematic analysis will be used to identify and compare barriers across three domains: housing, transport, and amenity access. The study aims to produce a nuanced understanding of how local socio-economic, cultural, and policy contexts shape the lived experiences of older adults. By studying Denpasar city at different stages of economic development and urban governance, the findings will generate transferable insights for policymakers, urban planners, and health practitioners seeking to develop context-sensitive strategies to support healthy and dignified ageing in place across Indonesia. The results also perform conceptual design and laboratory testing of a modular, sensory-friendly navigation aid system for the elderly in navigating a simulated indoor public space (e.g., hospital hallway) to assess optimal signage.

60. Developing a Methodological Approach for the Reactivation of 20th-Century Department Stores and Shopping Centres: Application to GTC in Skopje

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Abstract

Background and Aim. Department stores and shopping centres from the 20th century are not only commercial buildings; they are also social places that shape the community. Today, e-commerce and changing consumer habits create new challenges for these buildings as the interest shifts and takes another form. If these structures are adapted carefully they still can be reused in today's time. The aim of this research is to develop a method which can easily be applied to the shopping centres from the 20th century. This study targets the City Trade Center in Skopje and tries to test the methodology and see if that kind of action will help in reactivating it again and making it a major gathering point. This will not only help the owners of the stores to gain more customers but also to enhance the livability of the place.

Methods and Data. The method that was developed is tested on the City Trade center (GTC) which started from the idea to analyze its possibilities of attracting international multiband company LPP as a tenant. The data gathered is from a previous research done on GTC about its economical functionality and maintenance that will be combined with professional questionnaires from LPP as potential stakeholder. Surveys with the customers and methodologies from other case studies from previous research (Lundgren's study and the study from Støre-Valen et al.) shall be adapted.

Originality. The value of the study is the connection of actor mapping, owner-tenant collaboration, retailer requirements and consumer opinions in one method. This makes it possible to see which existing qualities can be used, where the three perspectives align, and which problems still need to be addressed.

Practical and Societal Implications. The study offers methods that can be used in the early stages of reactivating similar commercial buildings. It helps owners, managers, designers and stakeholders discuss refurbishment, leasing and future use together, while user needs and the identity of the building are still part of the decision. In this way, commercial and financial questions are considered together with social sustainability.

Type of Paper. Full Research.

Keywords: reactivation, methodological approach, adaptive reuse, retail property management, owner-tenant collaboration, facility management, GTC Skopje

AI DECLARATION: AI-assisted tools supported language editing, structural refinement and clarity.

61. Nusantara, a Third Path: Reading Yoka Sara's Design Process through a Phenomenology of Place

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Abstract

Debates on Arsitektur Nusantara continue to gravitate towards two poles: identity as the representation of traditional form, and locality as technical performance in response to climate and construction. This study proposes a "third path" by treating Arsitektur Nusantara as a formal object: design knowledge grounded in the experience of place. It seeks to identify the principles that inform Yoka Sara's practice and to explain how site, time, climate, users, and culture are translated into architectural decisions. The research adopts an interpretive qualitative approach and a multiple-case study design. Five projects were selected purposively: Kayu Aga Residence, Balai Banjar Gerenceng, Del Mango Villa, The Sari, and Catu Salila. The evidence comprises design documents, observations, project publications, and two interview transcripts. Analysis proceeded in two stages: a within-case reading structured by the sequence phenomena of place–architectural interpretation–design translation, followed by cross-case comparison. The findings show that the consistency of Yoka Sara's work lies not in a recurring style, material palette, or iconography, but in a recurring procedure of translation. Place is read through boundaries, contours, vegetation, water, light, wind, temporal change, activity, and cultural structure. These readings are then mediated through orientation, zoning, thresholds, sequences, shelter, landscape framing, and tectonics. Kayu Aga works with an agrarian horizon; Gerenceng negotiates publicness and cultural continuity; Del Mango abstracts shade and wind; The Sari turns the street-to-beach transect into a narrative; and Catu Salila follows contours, water, and the horizon. The study concludes that a Nusantara character can emerge without imitating traditional form when design operates as a way of knowing, valuing, and negotiating place. Its claims are limited to design intention and process; actual atmosphere, bodily orientation, and sense of place require evaluation with users.

Keywords: Arsitektur Nusantara; phenomenology; design process; place; Yoka Sara; multiple-case study

62. Reinterpreting Catuspatha in Ubud, Bali: Living Heritage Infrastructure for Cultural Sustainability and Conditional Regenerative Place-Making

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Abstract

Catuspatha, the traditional four-way intersection of Balinese settlements, is commonly interpreted as a symbolic spatial structure associated with cosmological orientation, royal authority, ritual life, and civic organisation. In contemporary Ubud, the inherited node also accommodates intensive tourism, commerce, public use, and motorised mobility. This study examines how central Catuspatha operates as living heritage infrastructure within a transforming cultural-tourism landscape. A qualitative single-case spatial design integrated morphological mapping, structured non-participant observation, qualitative activity mapping and movement tracing, photographic analysis, and document analysis. Structured field observations were conducted at five microsites during morning, midday, and late-afternoon sessions on 27 July 2026, supported by supplementary photographic documentation collected on 5 April 2026. The inherited relationships among Puri Saren Ubud, Ubud Market, the sacred-communal precinct, civic functions, and principal circulation axes remained recognisable despite physical and functional change. Daily rhythms shifted from local and market-oriented exchange in the morning to tourism-oriented viewing at midday and intensified mixed movement and public occupation in the late afternoon. These overlaps strengthened cultural visibility, accessibility, public interaction, and economic vitality, while generating congestion, pedestrian-vehicle conflict, crowding, and pressure on sacred thresholds. The study interprets Catuspatha as a sacred-connective-public-touristic node and a distributed public realm characterised by adaptive cultural continuity and conditional regenerative potential. Future sustainability depends on pedestrian continuity, culturally sensitive mobility management, protection of sacred and communal thresholds, and coordinated customary-formal governance.

Keywords: Catuspatha; living heritage infrastructure; cultural sustainability; regenerative place-making; Ubud; cultural tourism

63. Lighting comfort: the study of Standard lighting assessment with dialux and regression method at playground area in Sewaka Dharma Open Space

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Abstract

The regulation of child-friendly open spaces in Bali requires every public space to have a children's play area. It's no surprise, then, that through this policy, many play spaces or areas are found in every public space in Bali. Friendly is not only related to atmosphere and security, but also seen from the services provided. One of the services that must be present in child-friendly public open spaces is comfortable lighting. Through research on the level of lighting comfort, this study focuses on assessing user comfort in public spaces through lux and perception assessments. The novelty of the research is seen from the combination of methods and the location chosen, namely the Sewaka Dharma Open Space (TKSD) in Denpasar City. The solution to the research problem uses a quantitative research method by calculating lighting standards (Lux) using Lux calculation techniques and the dialux application, and also observing visitor perceptions regarding lighting in the park. Through the inventory, it was found that the child-friendly play area has used lamps with a lighting intensity of 139 lm/W located at three points. However, with the placement of the light points, it was found that there were several areas that did not meet the standard for comfortable outdoor lighting, which ranged from 10-50 lux. This argument is further supported by the results of multiple regression analysis of visitor perception data, which yielded a positive hypothesis. The conclusion is that adjustments and additional lighting are necessary to optimize the comfort of the room's lighting.

Keywords: dialux, lighting, comfort, regression, garden