



Systematic Literature Review (SLR) of Urban Temporality Flexible and Adaptive Spatial Design Strategies in Urban Context

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Abstract

Urban temporality has become an emerging field of study in architecture and urban design, offering new perspectives on understanding urban space. However, systematic reviews of the evolution of this discourse remain limited. This study applies a Systematic Literature Review (SLR) using the PRISMA methodology to analyze the development of the concept of urban temporality in academic literature over the past decade. 200 publications containing "urban" and "temporality" were screened and assessed for eligibility, resulting in 25 studies analyzed bibliometrically. The findings identify six main themes, including Space Experience by Body Sense, Mobilities, Space Development, Spatial Dynamics, Infrastructure and Social Development, and Smart City. Trend analysis reveals a shift in focus from "rhythm" (2014–2019) to "social behavior" (2019–2024), reflecting a change in research orientation. This study contributes to mapping the thematic development and provides a foundation for future research into urban temporality.

Keywords: architecture; bibliometric; systematic literature review; urban design; urban temporality.

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1. INTRODUCTION

The growing complexity of urban challenges, including climate change, population growth, along digital transformation (Helbling and Meierrieks 2023; Chai et al. 2022). This statement highlights the importance of exploring how the concept of temporality can be applied to create more sustainable and adaptive cities. This argument is strengthened by (Redyantanu and Damayanti 2017; Harani, Atmodiwirjo, and Yatmo 2023b), where temporality is introduced through flexible and adaptive spaces that can withstand dynamic changes. Therefore,

exploring the concept of urban temporality is becoming increasingly relevant in architectural and urban design studies.

Urban spaces can adapt to socioeconomic and environmental changes (Sepe 2014; Ernst et al. 2016; Kowalczyk 2014). In architecture, the concept of urban temporality is often applied through flexible and transformative spatial design strategies (Harani, Atmodiwirjo, and Yatmo 2023a; Rahmah and Putrie 2021). Meanwhile, from an urban design perspective, this concept is becoming increasingly relevant in responding to the emergence of various dynamic

needs (Farooq and Pfaffenbach 2025). Thus, a deeper understanding of temporality can provide insights into creating spaces that are more responsive to societal needs.

The urgency of this research lies in the need to establish a connection between temporality, architecture, along urban design by conducting a systematic review of how this concept has evolved in academic literature. Therefore, this study aims to identify the context of temporality within the domains of architecture along with urban design over the past decade. Furthermore, it seeks to analyze the development of urban temporality discourse in academic literature.

This research aims to conduct a more specific exploration using the Systematic Literature Review (SLR) approach to examine the relationship between the concept of temporality and architecture and urban design. Previously, the context of temporality had been systematically discussed in urban planning literature. This study focuses on the concept of temporality within the domains of architecture along with urban design. Although Systematic Literature Review (SLR) studies have been conducted before, no research has specifically focused on developments based on Scopus publication data over the past decade. Therefore, this study is expected to serve as an essential

reference for academics, practitioners, and urban planners in addressing continuously evolving urban challenges.

2. METHODS

The synthesis in this study uses the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) as the methodological foundation. By using this method, the quality of the systematic review protocol can be improved, ensuring completeness and detecting selective reporting to support a more consistent along fully reported review, thereby ensuring its accuracy and transparency (Siddaway, Wood, and Hedges 2019; Selcuk 2019; PRISMA-P Group et al. 2015). PRISMA consists of a four-phase flow diagram: identification, screening, eligibility criteria, and also the inclusion of reports within the scope of the review (Selcuk 2019).

In the identification phase, a search using the keywords "urban" and "temporality" was defined to find urban studies that explore temporality in the urban context. The detailed process is illustrated in Figure 1 below.

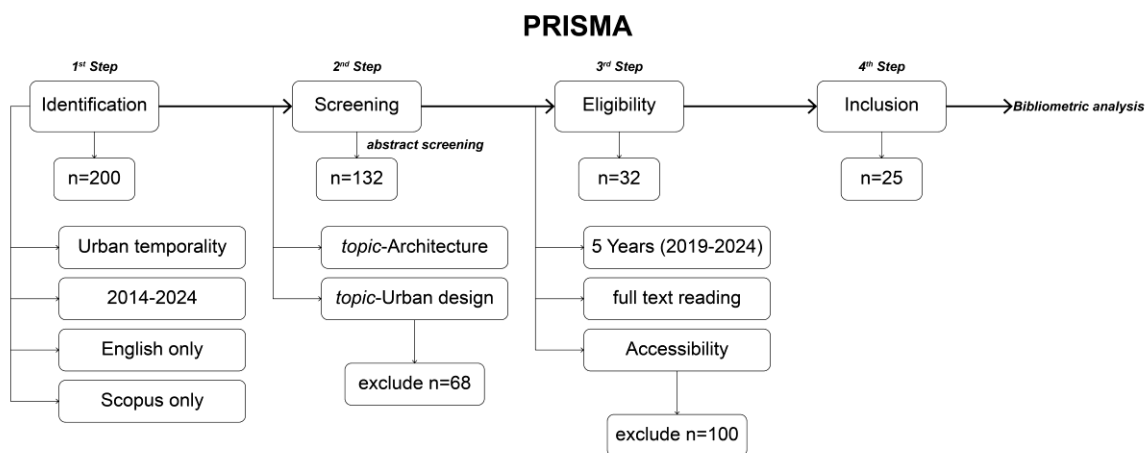


Figure 1. PRISMA Flow Diagram: Systematic Literature Review Process on Urban Temporality

A total of 200 publications were identified in the identification phase using Publish or Perish with the search keywords "urban" and "temporality." In addition to keyword-based searches, the selection also included only English-language publications that were accredited within the Scopus database. In the next phase, screening, a

comprehensive review was conducted to determine the relevance of the publications to the main topic related to architecture and urban design or urban planning. To ensure accuracy, an evaluation was carried out based on the titles along with abstracts of all articles, resulting in the exclusion of 68 articles due to their lack of

strongly related. This degree of association between items serves as the basis for forming diverse clusters.

Each cluster consists of interconnected nodes, representing thematic areas distinguished by different colors. The network analysis resulted in 17 clusters from a total of 238 keywords. However, only 6 of the 17 clusters are related to architecture and urban design, with clusters 2, 5, and 7 as key examples (see Figure 3). Cluster 2

includes keywords such as "atmosphere," "feel of place," "felt body," "home," "public space," "sense of place," "lighting quality," and "lighting". Cluster 5 includes keywords such as "housing," "place," "residential development," and "spatiotemporal analysis." Cluster 7 includes keywords such as "everyday life," "rhythm," "temporal analysis," and "urban space".

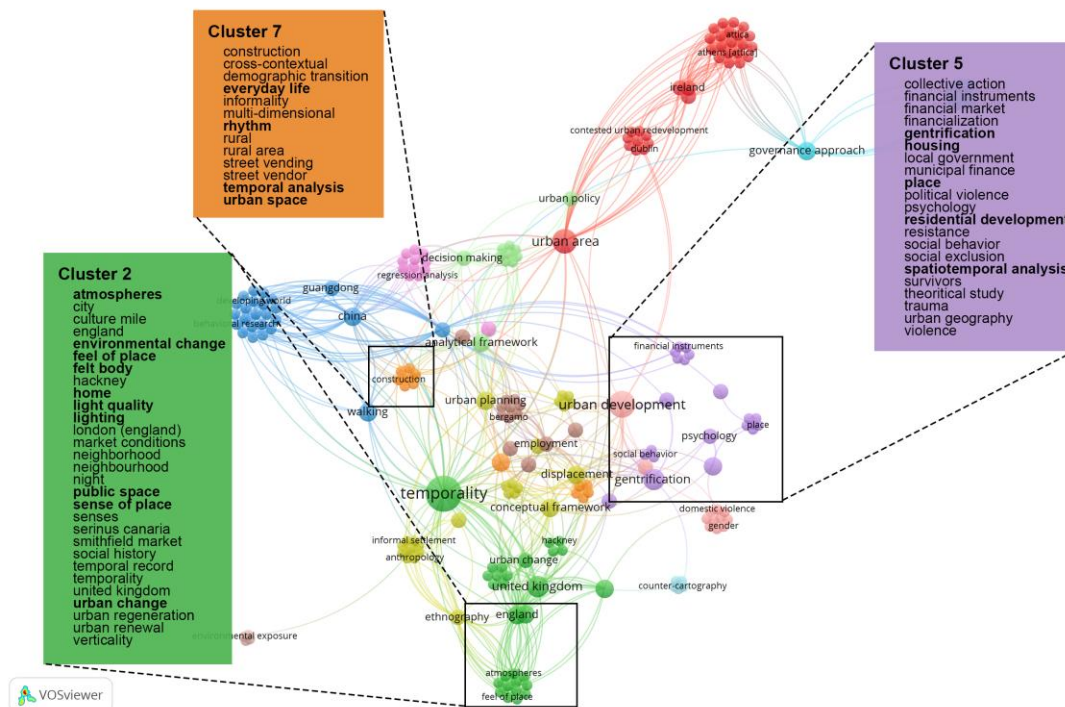


Figure 3. Cluster Mapping of Urban Temporality Research Topics

Next, the author attempts to identify the six clusters and assign appropriate names based on the focus of each cluster, derived from the keywords within them (see results in Table 1). By doing so, the author can more easily identify architecture-related topics that are frequently discussed within the urban temporality discourse. The identified topics include: Space Experience by Body Sense, which focuses on sensory perception in spatial experiences (Degen and Lewis 2020; Ebbensgaard and Edensor 2021; Blunt, Ebbensgaard, and Sheringham 2021). Urban Mobility, which explores movement patterns and mobility within urban environments (Chan et al. 2020). House and Space Development, which examines housing and spatial planning (Blunt, Ebbensgaard, and Sheringham 2021; Elliott-Cooper, Hubbard, and

Lees 2020; Pain 2021; Aalbers 2020). Urban Rhythm and Spatial Dynamics, which investigates temporal and spatial changes in cities (Sun 2022; Phillips et al. 2021; Blunt, Ebbensgaard, and Sheringham 2021). Urban Infrastructure and Social Development, which looks at the interplay between infrastructure and social structures (Datta and Ahmed 2020; Phillips et al. 2021; Ebbensgaard and Edensor 2021; Moore-Cherry and Bonnin 2020; Cooke, Landau-Ward, and Rickards 2020; Aalbers 2020). Smart City and Innovation, which discusses technological advancements and innovation in urban development (Kandt and Batty 2021).

Table 1. Thematic Clusters in Urban Temporality Studies

Space experience by body sense	Urban mobilities	House and space development	Urban rhythm and spatial dynamics	Urban infrastructure and social development	Smart City and Innovation
Atmospheres	Behavioral Research	Collective Action	Construction	Domestic Violence	Analytical Framework
City	Built Environment	Financial Instruments	Cross-Contextual	Gender	Big Data
Culture Mile	China	Financial Market	Demographic Transition	Gender Relations	Data Mining
England	Developing Cities	Financialization	Everyday Life	India	Database
Environmental Change	Developing World	Gentrification	Informality	Infrastructure	Decision Making
Feel Of Place	Environmental Features	Housing	Multi-Dimensional	Intimate	Mobilities
Felt Body	Exploratory Studies	Local Government	Rhythm	Kerala	Mobility
Hackney	Guangdong Level Of Satisfaction	Municipal Finance	Rural	Safety	Smart Cities
Home		Place	Rural Area	Urban	Smart City
Light Quality	Local Residents	Political Violence	Street Vending	Urban Development	Urban Analytics
Lighting	Meaning	Psychology	Street Vendor	Urban Society	Urban Policy
London (England)	Pedestrian	Residential Development	Temporal Analysis	Womens Status	
Market Conditions	Place Attachment	Resistance	Urban Space		
Neighborhood	Public Transport Research Work	Social Behavior			
Neighbourhood		Social Exclusion			
Night	Shenzhen	Spatiotemporal Analysis			
Public Space	Social And Cultural Context	Survivors			
Sense Of Place	Sustainable Transport	Theoretical Study			
Senses	Transportation Development	Trauma			
Serinus Canaria	Transportation Planning	Urban Geography			
Smithfield Market	Transportation System	Violence			
Social History	Urban China				
Temporal Record	Walking				
Temporality	Walking Environments				
United Kingdom	Walking Experience				
Urban Change					
Urban					
Regeneration					
Urban Renewal					
Verticality					

3.3 The Development of Urban Temporality Discourse in Temporal Maps (2014-2024)

At this stage, the author utilizes a total of 132 articles that have been carefully selected through the screening phase, ensuring their relevance along with alignment with the research objectives. These articles are then subjected to further analysis using VOSviewer, specialized

software designed for bibliometric mapping along with network visualization. Through this analysis, the author aims to generate a comprehensive visualization (see Figure 4) that illustrates the progression, and shifts, along with key themes within the urban temporality discourse over the past decade, spanning from 2014 to 2024. This visualization not only helps in identifying recurring patterns but also

highlights emerging trends along with evolving areas of interest within the discourse.

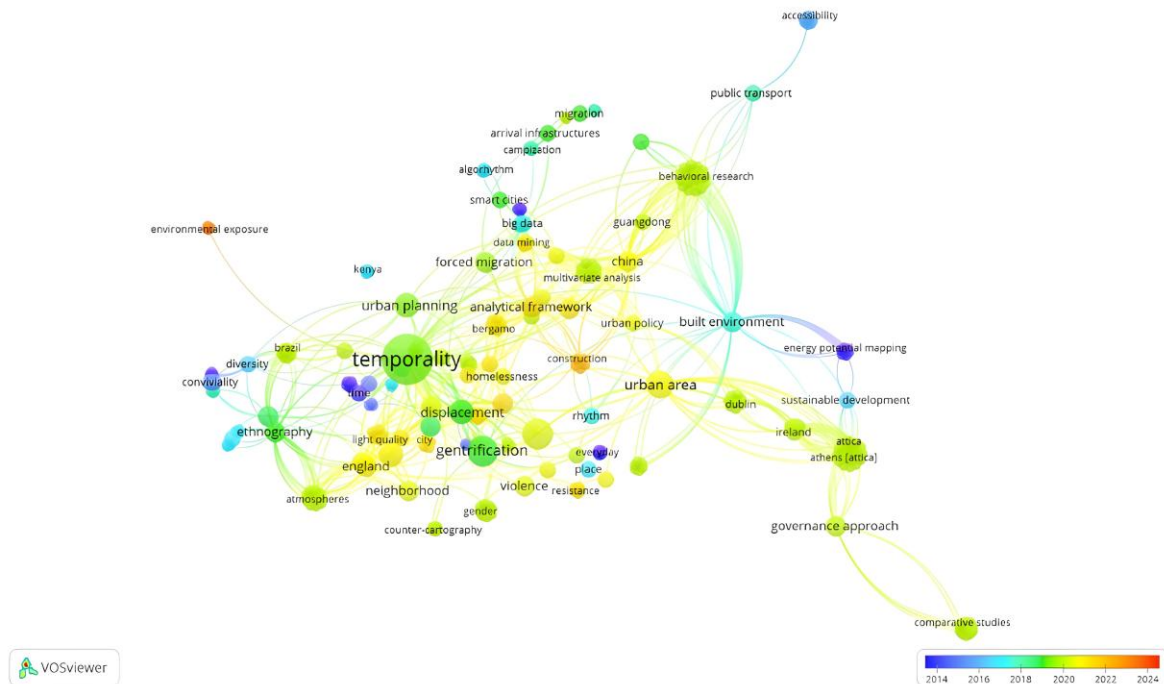


Figure 4. Temporal Evolution of Urban Temporality Discourse (2014-2024)

The results of this analysis consist of systematically compiled keyword data that covers an entire decade, which is further categorized into two distinct periods for a more structured comparison. The first period encompasses the five years from 2014 to 2019, while the second period focuses on the most recent five years, from 2019 to 2024. These keyword distributions, along with their frequencies and associations, are presented in a detailed manner in Table 2 to provide a clearer

picture of the changing dynamics within the urban temporality discourse. Based on the findings obtained from this analysis, it becomes evident that there are notable differences in the keywords that frequently appeared during the initial five-year period compared to those that have gained prominence in the more recent five-year period. These differences suggest shifts in research focus, theoretical approaches, and key discussions that have shaped the discourse over time.

Table 2. Temporal Keyword Distribution in Urban Temporality Research (2014-2024)

2014 - 2019	2019 - 2024
"Time"	"Atmosphere"
"Chronology"	"Demography"
"Urbanization"	"Behavioral research"
"Place"	"Urban development"
"Rhythm"	"Temporal analysis"
"Built environment"	"Urban housing"
"Place Attachment"	"Walking"
"Smart cities"	"Collective action"
"Urban Planning"	"Spatiotemporal analysis"
"Temporality"	"Social behavior"
"Gentrification"	"Greenspace"
"Housing"	"Mobilities"
"Displacement"	
"Public space"	
"Architecture"	

4. DISCUSSION

Based on the exploration conducted by the author, the obtained results need to be discussed in this section to achieve the research objectives, namely identifying architecture-related topics that are frequently discussed in the discourse on urban temporality and tracing the development of this discourse over the past decade (2014–2024). By understanding the trends in this discourse, the author can identify how the concept of temporality in architecture and urban design has evolved along with how various related aspects have changed over time.

From the results of frequency analysis and cluster mapping, the author observes that several architectural and urban design topics are closely related to and frequently discussed in the discourse of urban temporality. For instance, the frequency analysis indicates that four keywords have larger node sizes than others, signifying that these four keywords have been the most frequently discussed topics in urban temporality discourse over the past five years. Additionally, six clusters of keywords related to architecture along with urban design have been identified and named based on their respective focuses. This classification helps the author understand recurring themes in the discourse on urban temporality, thereby providing a more structured overview of the interconnections between various concepts emerging from previous studies.

Topics related to architecture and urban design include "temporality," "urban areas," "urban development," and also "gentrification," while themes discussed in the discourse of urban temporality encompass space experience through bodily senses, urban mobility, housing and spatial development, urban rhythm and spatial dynamics, urban infrastructure, and social development, as well as smart cities and innovation. By categorizing these themes, the author can better understand how the concept of temporality is applied in various aspects of urban planning along with how different approaches and strategies can be employed to address challenges related to temporary changes in urban contexts. This research also expands the understanding of urban temporality as proposed by (Lynch 1972), which has traditionally been based on spatial form and the physical world.

Furthermore, the findings of this study reveal design strategies for incorporating temporality in the urban context.

Meanwhile, through the exploration of the development of urban temporality discourse, the author has identified differences in keywords over the past decade. For instance, the keyword "rhythm" frequently appeared in the first five years (2014–2019), indicating its dominance during that period. In architecture, rhythm has long been understood as a repetition of form (Ching 1979), often referring to formal regularity without considering broader social dynamics. However, in the last five years (2019–2024), the keyword "social behavior" has become more dominant, replacing "rhythm" as a more frequently discussed topic in recent research. This shift suggests that the focus in urban temporality studies may be transitioning from rhythm toward more complex patterns of social behavior, potentially reflecting changes in how society interacts with urban spaces and adapts to evolving social and environmental conditions.

Nevertheless, the author also identifies similarities between these two keywords by referring to Wunderlich's (2013) theory, which states that rhythm is a key component of place temporality, playing a crucial role in how people experience cities. Wunderlich further explains that rhythm is formed based on everyday life patterns that emerge through repetition. The term "social behavior" consists of two English words, "social" and "behavior," which refer to human social habits that tend to be rhythmic and repetitive. Therefore, despite the shift in focus from "rhythm" to "social behavior," both concepts remain closely related within the discourse on urban temporality. It is interesting to revisit the discussion of rhythm along with social behavior in urban temporality.

This shift may indicate a broader understanding of how social factors influence urban temporality—not only shaped by recurring activity patterns but also by how communities collectively interact, adapt, and create social dynamics in their urban environments. Thus, the author concludes that the keywords "rhythm" and "social behavior" have a strong connection and play a significant role in urban temporality, further highlighting the potential transition from

rhythm to social behavior as a primary factor in shaping urban temporality.

This discussion presents an opportunity to critique the conventional understanding of rhythm as merely a repetition of form, as suggested by Ching (1979). This argument is supported by Lynch's explanation that the concept of temporality is traditionally based on spatial form (Lynch 1972). However, this discussion attempts to demonstrate that temporality is no longer solely dependent on spatial form but extends beyond it. The discourse on temporality has evolved to encompass the study of rhythm in everyday life.

5. CONCLUSION

This study highlights the importance of the concept of urban temporality in designing and managing more adaptive and sustainable cities. Temporality in the urban context reflects how space and time interact to shape evolving social, economic, along environmental dynamics. Cities are not static entities but rather systems undergoing continuous transformation due to social interactions, technological advancements, and implemented policies. Therefore, understanding temporality becomes a crucial aspect of urban planning, enabling more flexible and responsive strategies to address future challenges.

The systematic review in this study reveals that the concept of urban temporality in architecture and urban design can be applied through flexible and adaptive spatial design strategies. This builds upon previous studies that explained how temporality-related strategies can create adaptive and flexible spaces, particularly in urban contexts. The flexibility of space allows it to adjust to changing needs, both in function along usage patterns, enabling a more effective response to urban dynamics.

Through keyword frequency analysis, this study identifies four main topics frequently discussed in the discourse on urban temporality: temporality, urban areas, urban development, and also gentrification. Additionally, through keyword clustering analysis, six main themes related to urban temporality in architecture and urban design have been identified: space experience through bodily senses, urban mobility, housing and spatial development,

urban rhythm and spatial dynamics, urban infrastructure, and social development, and smart cities and innovation.

This research demonstrates that urban temporality contributes to the ongoing discussion of everyday life along with the production of space. These aspects are also related to spatial strategy, which concerns how space is configured, utilized, and adapted in response to social, economic, and temporal dynamics within urban environments. The findings indicate a shift in the understanding of architecture and urban design, moving away from fixed notions. This shift allows urban spaces to be more adaptive to change, thereby supporting efforts to create sustainable cities.

This study serves as a foundation for further research into exploring how temporality influences spatial adaptation, socio-technical dynamics, and also urban policies. However, it has limitations, as it is based solely on Scopus-indexed publications and focuses on keyword clustering. Consequently, this research has not yet fully captured the concept of temporality in a broader context. Future studies can be conducted through comparative case studies or explorations of real-world manifestations of temporality in response to the continuously evolving dynamics of urban temporality.

AUTHOR CONTRIBUTIONS

The first author (KAE) served as the primary initiator of the research idea and was responsible for conceptual formulation, data collection, and data analysis. Meanwhile, the second author (ID) and third author (DS) acted as academic supervisors, providing guidance, conceptual input, and validation of the methodology and research findings to ensure the quality and academic accuracy of this study.

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