Reading Mutations: An Urban Diagram of Time

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Abstract

Since time is a way to read the city, how can urban processes be captured in a single drawing? Moreover, how can diagrammatic concepts and mapping techniques be used to reveal mutations in the city?
The concept of mutation, strictly related to time, refers to the formal and functional changes that occur within a stable urban frame. To show this concept, it is necessary to reconsider traditional methods of representation. The map, historically used to define the physical form of the city, provides a grounded and static reading of the space. The diagram, on the other hand, introduces a conceptual dimension, allowing for the representation of relationships, processes, and transformations. Rather than searching for permanent elements to validate the city's logic, this work defines mutations as a fundamental key to understanding contemporary urban dynamics. Through this lens, the use of the diagram enables the invention of new spatial narratives, producing a new specific reality within a new temporality, delving into diachronic and synchronic time.

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From the book

Saverio Muratori, Studi per una operante storia urbana di Venezia, 1959.

Saverio Muratori, in his book, proposes a method for interpreting the transformation of Venice over time by studying the evolution of its neighborhoods. The area of San Bartolomeo is the most extensively represented, due to the availability of a greater number of drawings and data, which allow for a more complete reconstruction of the island's transformation. Through a sequence of maps from different historical periods, Muratori analyzes the city's dynamics while emphasizing its structural continuities. His work is organized into four main temporal phases here represented (T1, T2, T3, T4), tracing the evolution of San Bartolomeo approximatelly from the year 1000 to 1959.

T1_1000-1200
Parish building and byzantine expansion

T2_1300-1400
Byzantine consolidate and north extension

T3_1700-1800
Replacement of medieval buildings

T4_1959
Survey stage

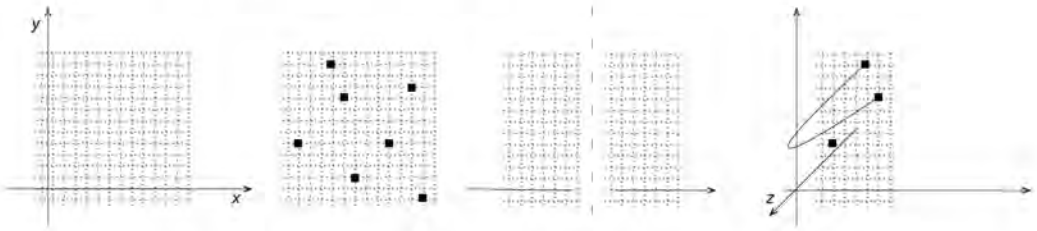
Despite the intention to illustrate the transformation of the island through mapping, Saverio Muratori never combined the drawings of San Bartolomeo into a single, unified image. This attempt at recomposition represents a first effort to understand how the city has changed over time by overlapping the individual drawings (T1, T2, T3, T4). However, the result does not fully capture the complexity of the transformation, it emphasizes only one aspect: what remains fixed throughout the process.

T1+T2+T3+T4_*Map of permanences*

Fig. 1 - The map of San Bartolomeo in Venice.

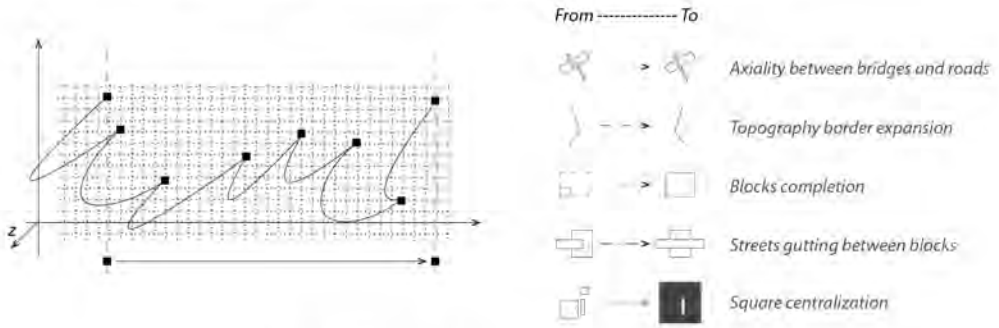
How to read the diagram

The following diagram is based on data from Saverio Muratori's maps of the San Bartolomeo area in Venice. It visualizes diachronic transformation while introducing a synchronic perspective, shifting the focus from the reconstruction of continuities to the interpretation of urban mutations.
To represent this, a conceptual field is established, starting from a coordinate system that evolves from two to four dimensions. The two main axes correspond to time (x-axis) and scale resolution (y-axis). Between them, a diachronic plane develops (1), within which frames, extracted from Muratori's maps, are located (2). Temporal intervals are expanded or contracted depending on the amount of available information for a given year. The distance of each frame from the vertical axis reflects its spatial configuration at that specific moment.
When a transformation occurs in the urban fabric, often instigated by a defined intervention or project, it interrupts the diachronic continuity. This interruption gives rise to a synchronic counter-space (3), a sectional cut in which a localized transformation can be isolated and analyzed.
To reestablish a system of continuities, each frame is then related to the others in depth along the z-axis (4). The spatial distance from the diachronic plane defines the strength and the type of relationship: direct if extending outward, indirect if receding inward the dyacronic space.
This framework allows for an understanding of how different urban elements relate to one another across time and scale, revealing both continuities and discontinuities within the evolving city.



1_ reference system time-resolution | *2_ urban frame in relation with time* | *3_ Syncronic section of the reference plane* | *4_ Relation between frames on the z-axes*

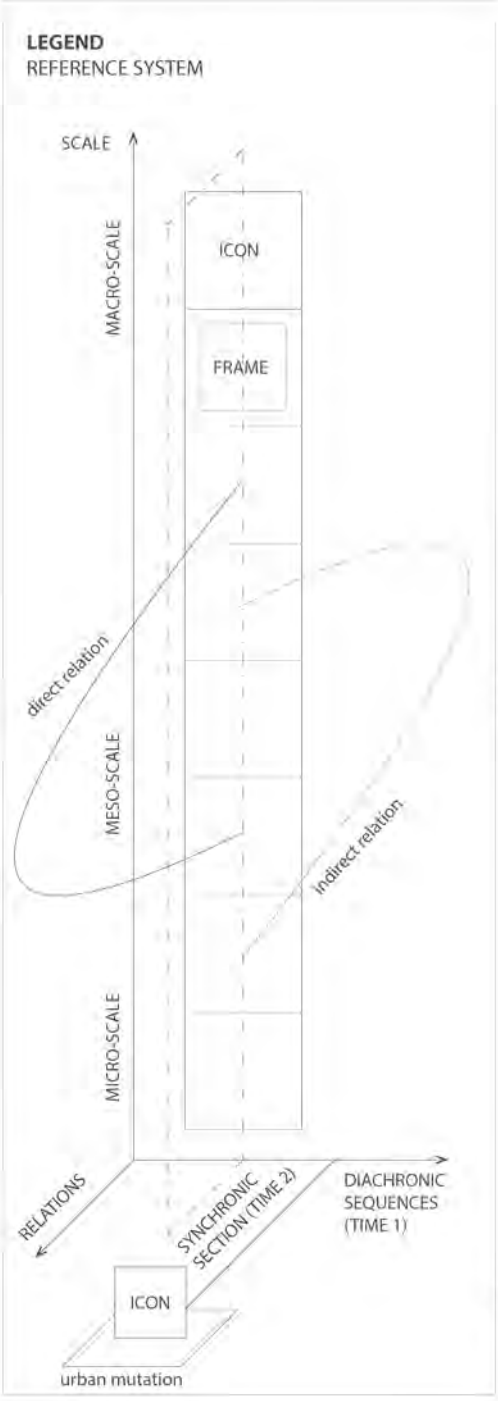
Following the five trajectories defined by distinct lines, it is possible to reconstruct several key urban transformations, represented by icons, that have been identified in Venice. These transformations are mapped using the diagram and illustrated at the bottom (5).

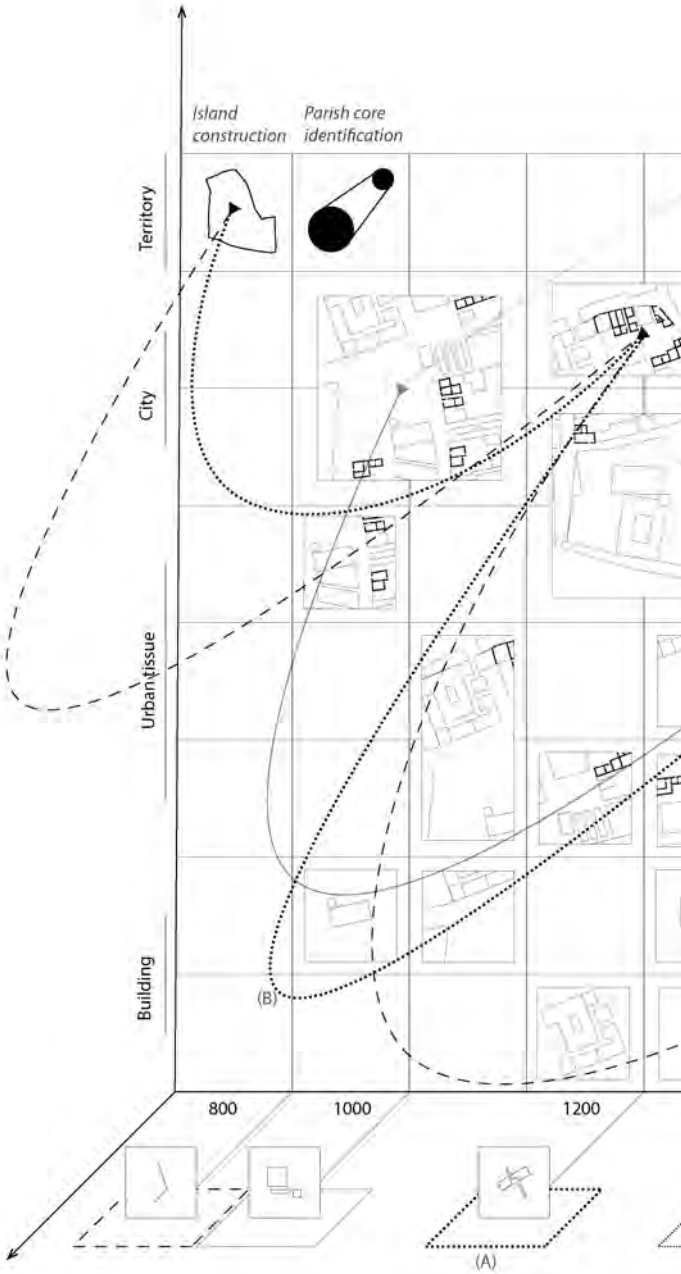


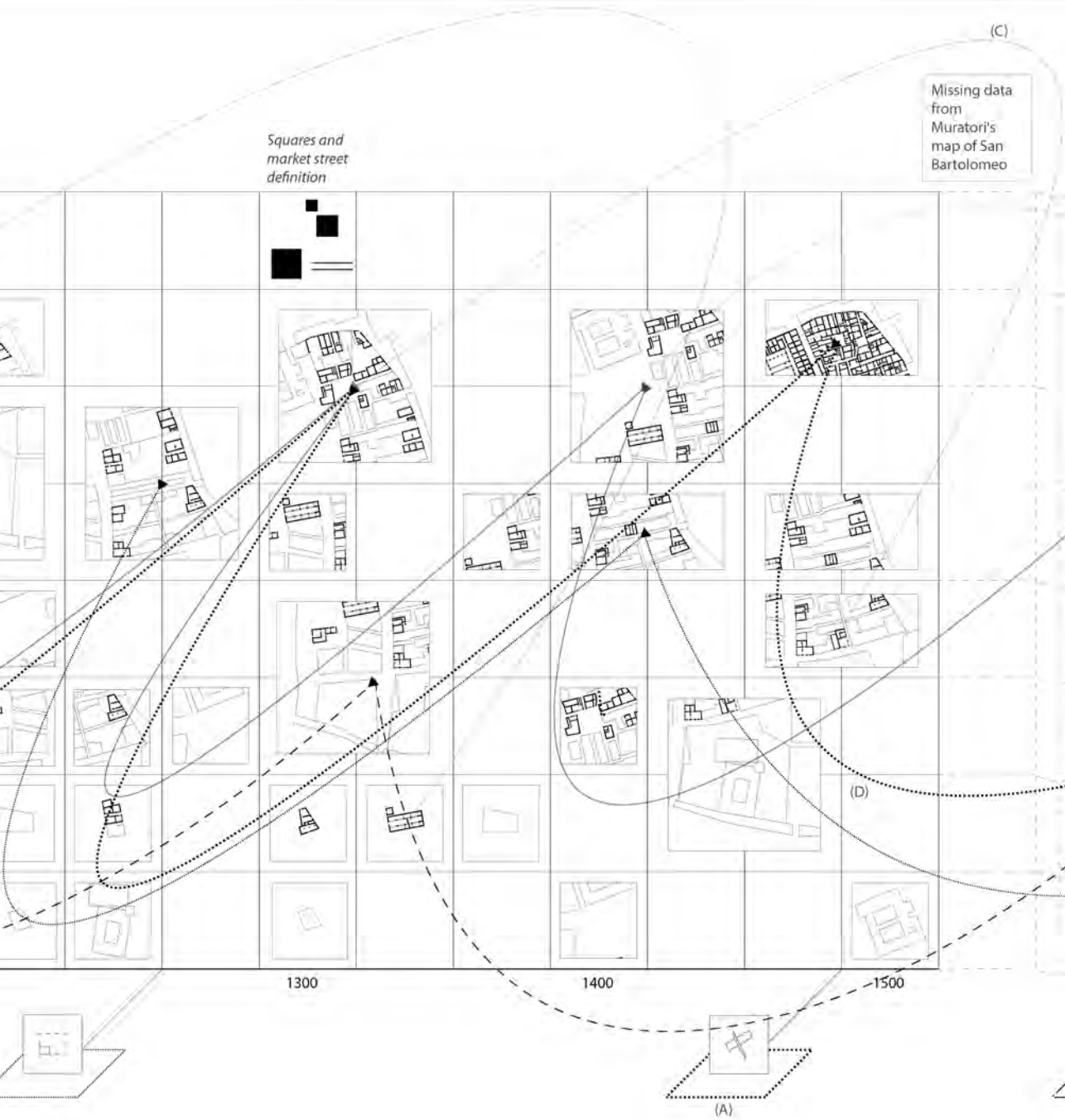
5_ Routes to understand urban mutations. From how it was to how it is

Fig. 2 - Instruction to read the diagram.

Diagram of San Bartolomeo in Venice (reconstruction based on Saverio Muratori Maps)



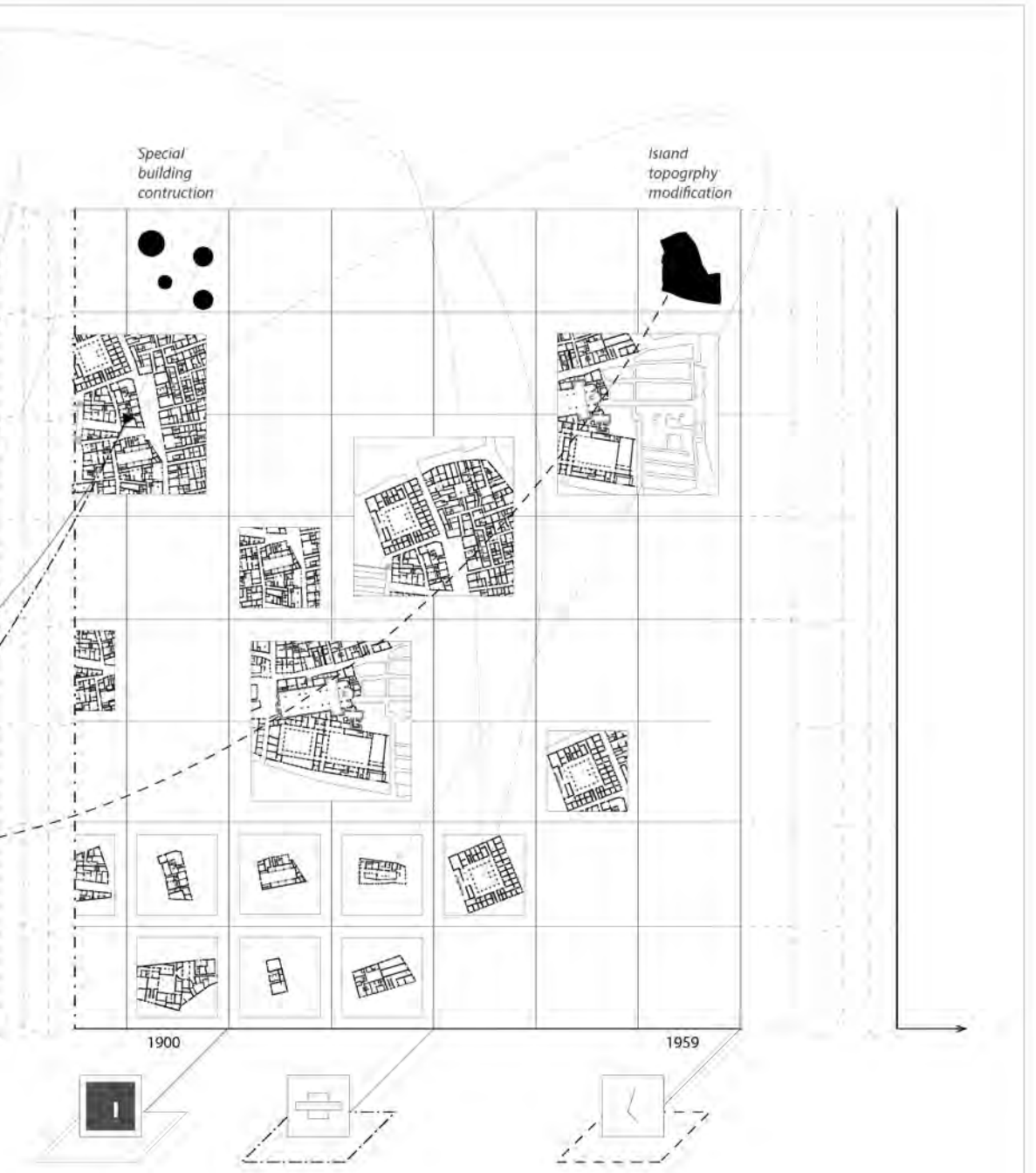



(C)
Missing data from Muratori's map of San Bartolomeo
Squares and market street definition
(D)
1300
1400
1500
(A)

SYNCHRONIC SECTION

Reconstruction of a specific event - the construction of Rialto Bridge

Fig. 3 - Diagram to read city mutations in San Bartolomeo.



The study led by Saverio Muratori in 1959 on Venice addresses the need to define operative methods to read, interpret, and represent how cities change over time. His study on Venice stands out as an investigation into the role of urban evolution to inform future design interventions. The maps developed were not only acts of analysis, but also tools of historical and critical knowledge, combining survey data with speculation and inference, making them a hybrid between observation and hypothesis.
A key assumption of this study was the identification of repeated and fixed elements of the city as structuring components of the urban system. However, a significant issue lies in the inability to relate these fixed elements to the dynamism of urban changes. The urban morphology of the contemporary city can't ignore the ongoing metamorphosis of settlement forms. Identifying mutations within the urban fabric becomes a fundamental step in grasping the continuous transition that the city undergoes over time.
Stewart Brand, in *How Buildings Learn: What Happens After They're Built* (1994), reflects on time's role in architecture. To examine its historical function and context, a synchronic reading of the time may occur; another way is to trace how it evolves over time, diachronically. To understand the complexity of an urban transformation, it is necessary to combine the two approaches.
Diachronic evolution has often been studied through maps, layering information to uncover patterns of repetition. Muratori's maps of San Bartolomeo, for instance, emphasize a succession of historical phases defining what remains fixed. The map is understood here as a cartographic representation of the built and natural landscape (Abrams & Hall, 2006). The diagram, by contrast, acts as an intermediate condition between presence, image, and idea, past and present (Garcia, 2010). It spatializes a selective abstraction of a concept or phenomenon, in this case, highlighting mutations in San Bartolomeo.
This experiment explores how the maps, used to show the city's physical form, can be combined with the inventive power of diagrams, which help organize and reveal information that might otherwise remain hidden in the subtext of the map. By tracing five routes through San Bartolomeo, it is possible to observe how, despite certain stable elements like the ancient parishes and the Venetian squares, the city has undergone subtle but significant shifts.
One example can be seen in the evolving connections between the small island of San Bartolomeo and its surroundings (A). Since the formation of the island and the initial settlement around the church between 1000 and 1200, the island was originally linked to neighboring areas by wooden bridges (B). Over time, as the market's centrality to Venice grew and pedestrian movement increasingly replaced water transport, these connections gradually shifted (C). As the surrounding urban fabric became more defined, the original wooden bridges were replaced with more permanent structures, realigned to create stronger connections with

the primary street network. A key frame in this transformation was the replacement of the wooden structure of the Rialto Bridge with the stone bridge that stands today (D).
This example does not introduce new urban theories about San Bartolomeo, but it demonstrates how change can be made visible and explicit by tracing and reconstructing its processes. While this approach does not offer a definitive reading of urban transformation and it has not been yet tested on a contemporary design case study, it suggests a way to explore the relationship between city and time, either by uncovering the logic of change or by enriching archival research with new information.
This approach shows how, through diagrammatic representations, it is possible to reinvent the existing morphological studies in order to introduce variables and parameters, such as urban mutations, useful for a design yet to come. Beyond its pictorial function as an image, the diagram adopts a logical, operational construction (Allen, 2009) becoming an active tool of interpretation and design.

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