



INTELLIGENT VENICE

The oldest city
of the future

EXHIBITION GUIDE

Special Project

of the Venice Sustainability Foundation (VSF)

for the Biennale Architettura 2025

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Introduction

The **Intelligent Venice Pavilion** comes to life around a central thread running through all its sections: the concrete demonstration of the existence of a **collective intelligence**, capable of shaping—over the centuries—a unique and constantly evolving creation: Venice and its lagoon. An intelligence sedimented over time through the shared knowledge of artisans, fishermen, navigators, workers, and citizens. Alongside the great names of Science, Art, Engineering, and Architecture—who were able to generate brilliant visions thanks to a **fertile and extraordinary context**—there exists a widespread heritage of quiet expertise and daily actions.

We do not know the names or biographies of these ordinary people, often left out of the pages of history. Yet it is their work, visible in this exhibition, that tells the story of a shared ingenuity—an ingenuity capable of innovating without betraying its memory. Of the “brilliant” and important people, we know everything from history books, even details of their private lives. **In this exhibition, however, there are no names or personal stories.** What is shown **here are the achievements—the works—of this collective and distributed intelligence**, which does not forget what has been, but finds in its history the very ability for continuous innovation.

The Pavilion exists within the **Biennale Architettura**, as a discipline that organizes human-made space, is characterized by a **strong sense of concreteness**. Its practical nature, expressed in the design and construction of buildings and environments, distinguishes it from other more abstract forms of art. It is within this architectural context that Venice is framed as a **paradigmatic example**, to showcase its **ability to adapt to a unique environment (the lagoon)**, unsuitable for urban development—its ability to overcome (in the past) construction challenges on soft ground, the lack of potable water, the impossibility of using animals as a driving or transport force, and (in modern times) its insularity, car-free mobility, frequent flooding, and overexposure to tourist flows. These and many other “defects” would typically hinder urban development, both then and now.

Instead, in **Venice, thanks to continuous innovations—both small and large—these challenges are truly turned into opportunities**, meeting the social needs of the moment. These innovations—these works of ingenuity—have been, and still are, a source of **wealth for Venice and an example for the entire world**.

Long before the term “environment” took on its current meaning, high attention to it was already rooted in Venice, even permeating its legal system. Scarce environmental resources (water), fragile ones (the morphological balance of the lagoon and its relationship with rivers and the sea) were already in the Late Middle Ages defined as **res publica**, addressed by specific legislation and continuously managed by the State.

Today’s interventions in Venice—**MOSE** being the most well-known—which once again astonish the world with their scale, precision, and effectiveness, are simply the offspring of this centuries-old culture. They are in continuity with, not in contradiction to, those of the past. They protect not only the city’s artistic and architectural heritage but also

guarantee a **new balance between environment and society**, in line with global values that recognize the need to **protect biodiversity**.

Indeed, the exhibition also concerns the construction of the landscape and environmental protection—past and present—capable of using “**Nature-based Solutions**” to face **global phenomena**, such as sea level rise, and competition from other localities.

The **true meaning** of the exhibition, however, is not to recount a past story, but to present a **rich present, where seeds of the future** are already planted, and the ground is being prepared to receive more.

The story of Venice has always been one projected into the future. The Republic of Venice would not have lasted so long if its people had not embodied a multigenerational vision—and even today, modern tools aim to manage what is to come.

Innovation—based on science and research—and the sustainable use of environmental resources has always been and still is the driving force of society, the key to Venice’s extraordinary success, expressed in the **collective intelligence that resonates in both Venice and this Pavilion**.

The itinerary exhibition

The exhibition is structured around **multiple levels of interpretation**, designed to offer a differentiated experience tailored to varying needs and timeframes of visit. Particular care has been taken to ensure that the “message” of the exhibition is conveyed **regardless of how much time a visitor is able to dedicate to it.**

Upon entering the Pavilion, visitors will find themselves immersed in a **basilica-like architectural space**, with a rhythmic wall structure created through a sequence of **apses and vertical panels.**

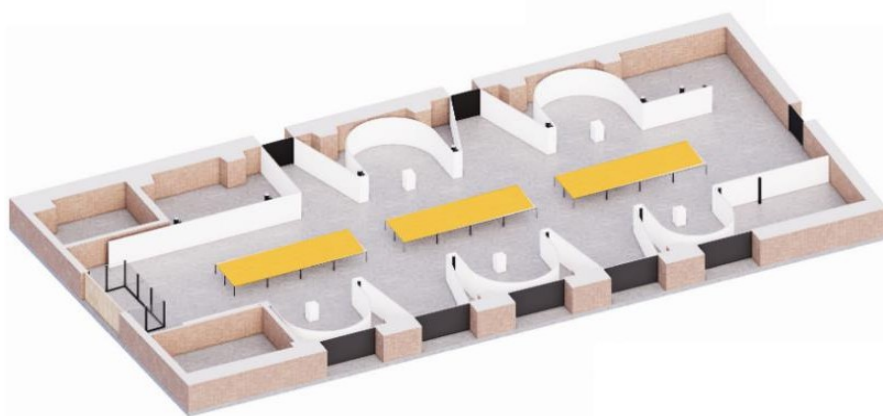
The content is organized into three main sections:

- *The ApSES of Intelligences*
- *The Venetian Abacus*
- *Actors of Today and Tomorrow*

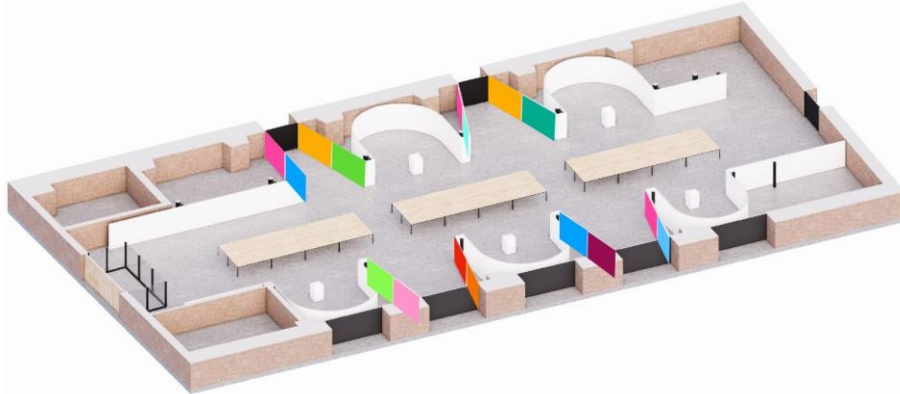
The five **ApSES of Intelligences** present the processes of formation and management—both historically and in the present—of the city and the lagoon.



The Venetian Abacus, which unfolds along the central axis of the Tesa, showcases the objects, tools, mechanisms, and technologies through which Venetians have succeeded in transforming an apparently uninhabitable place into one of the most important examples of global urban history.



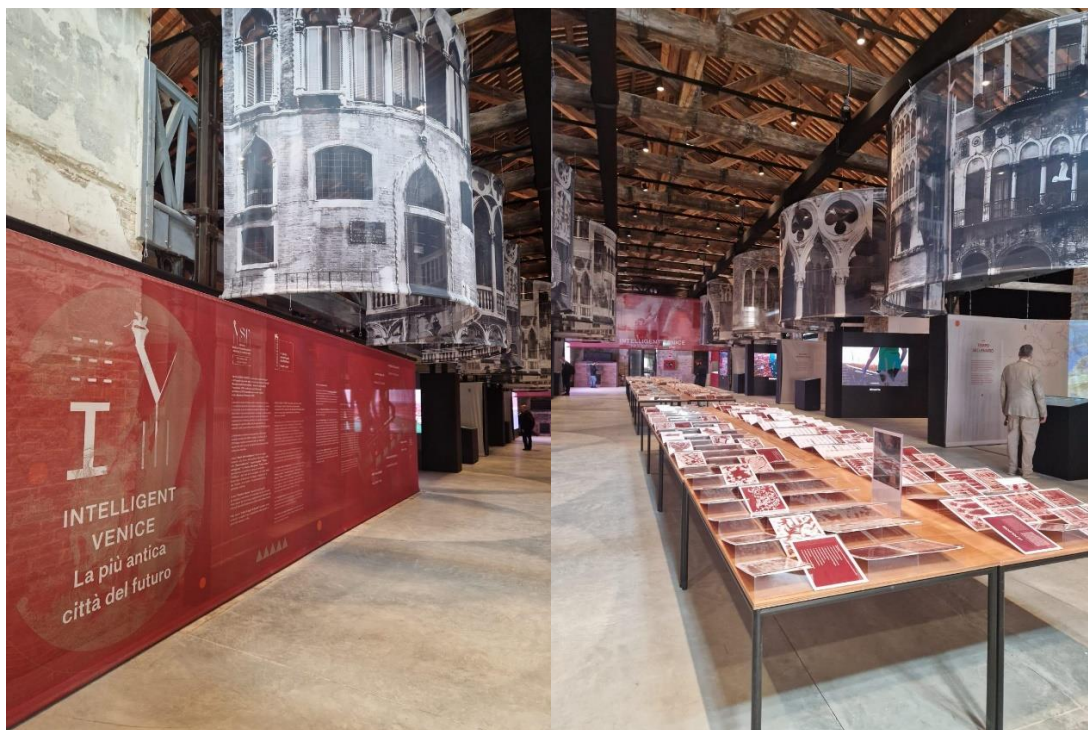
The section **“Actors of Today and Tomorrow”**, located along the connecting walls between the Apses of Intelligences, presents 14 ongoing and developing projects carried out by an equal number of actors—both public and private—who are active in the city.



All the content represents a *real*, documented reality and has undergone rigorous scientific review. Much of the material on display is previously unpublished, and where it comes from archival sources, it has been edited in an original way specifically for the exhibition.

Visitors can **interact directly with the five touchscreens** located within the Apses, allowing them to quickly select the material of most interest and explore it at their preferred level of depth.

The following chapters provide a deeper look into the various sections of the exhibition path.



The apses of Intelligences

Abside 1 "Millenary time"

Abstract

The time of the present generation is just a fragment in the long course of Venice's history—following times already lived and preceding those yet to come. The lagoon is an ephemeral natural element, whose continued existence today is the result of its interaction with human society. Its current and future role is to serve as a connector, integrating different urban realities with one another.

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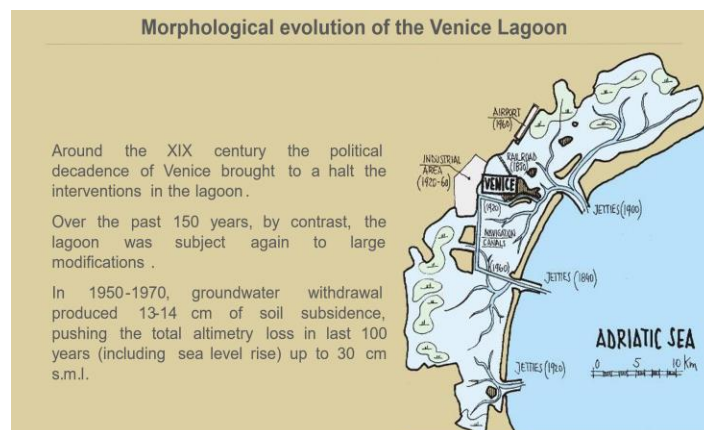
It shows the evolution of the lagoon's morphology and the perimeter of the city-port, highlighting the natural forces (subsidence, eustatism) and the management of river sediments.

The following topics are explored in detail:

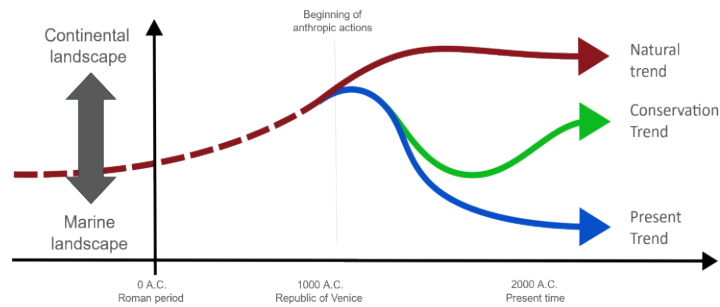
- The role of the barene (mudflats), both in its ecological functions and in restoration projects
- The growth of the port, first within the city, then in Marghera
- The evolution of bathymetries and the methods of studying them
- The role of sediments, the historical diversion of rivers, and ongoing erosive processes
- The evolution of the port entrances from ancient times to the present

This theme is contributed by the Autorità di Sistema Portuale dell'Adriatico Settentrionale - Porti di Venezia e Chioggia, CORILA - Consortium for the Coordination of Research on the Venetian Lagoon System, and the Università Iuav di Venezia.

Examples of images from the touchscreen



Morphological evolution of the Venice Lagoon



Without human intervention the Venetian Lagoon would have filled up with sediments and evolve into a Continental landscape. Over centuries it has thrived thanks interventions carried out by humans, creating a perfect symbiosis between human work and nature.

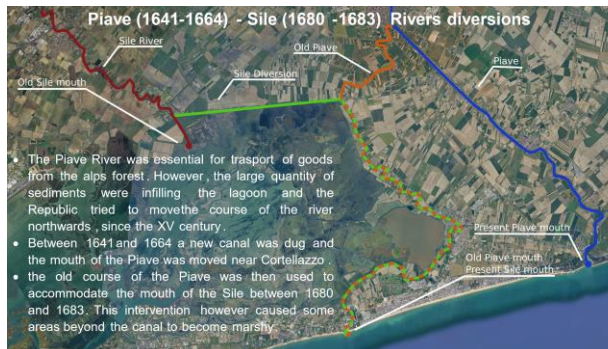
Evolution of a port City

The evolution of the port is strongly tied to the city morphology. It starts in the Rialto area and progressively expands along the southern city limits

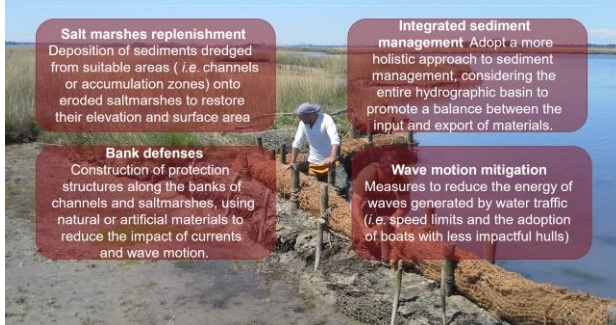


Evolution of a port City

In the early 1900s begins the development of the Porto Marghera industrial site. The port activities are gradually moved there.



Protection actions



Creation of protective barriers



Apse 2 “Regulated lagoon”

Abstract

The defense of Venice from floods has not aimed to isolate the city from the sea, but rather to apply intelligent regulation to the natural tidal fluctuations, so as not to disrupt the lagoon's ecosystem services. The mobile barriers of MOSE, which have protected Venice from flooding more than 100 times since October 3, 2020, represent an extraordinary work that complements many other interventions, forming part of an integrated protection strategy to increase resilience in a very complex system, described in this section.

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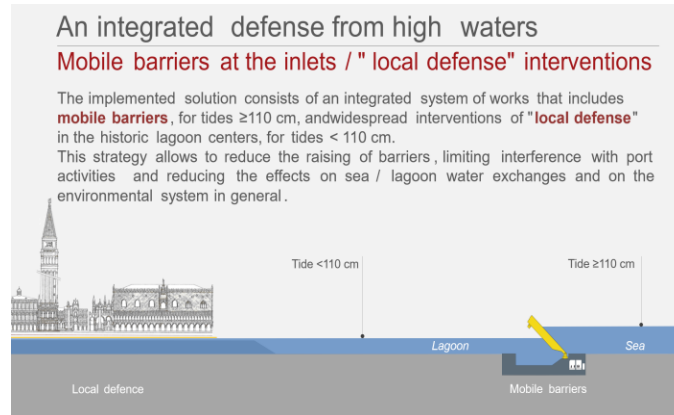
The apse illustrates the integrated protection and management system for the Venetian Lagoon, highlighting the key actions undertaken to address the environmental, climatic, and urban challenges facing the city and its surrounding territory. The main themes addressed are:

- The MOSE barriers: from the problem to the solution. This section describes the main components of MOSE (caissons, hinges, sluice gates), its construction, and operation, which are part of a broader integrated defense system for the entire lagoon. There is also a focus on management and maintenance.
- Environmental protection and resilience: this describes the interventions for renaturalization and natural engineering (such as artificial mudflats) to combat the effects of rising sea levels, protect biodiversity, and regulate the hydraulic dynamics within the lagoon.
- Protection from storm seas: strengthening of the coastlines, particularly in Pellestrina, with structural interventions to contain coastal erosion and protect inhabited areas. Works to raise pavement levels and secure lower-lying areas, with specific interventions in Venice and Chioggia, including:
 - Baby Mose: local mobile sluice gates to protect the most vulnerable areas.
 - Riverbank restoration and raising of public path levels.
 - The defense of the San Marco area

The presentation includes maps and images documenting the work carried out in the main lagoon and urban areas: Venice, Chioggia, Lido, Pellestrina, Treporti, Torcello, and Murano.

This apse is contributed by materials from the Autorità della Laguna and the Consorzio Venezia Nuova.

Examples of images from the touchscreen



Apse 3 “Anthropized nature”

Abstract

The Venetian Lagoon is the largest in the Mediterranean, an important wetland for biodiversity conservation. Its co-evolution with the needs of society makes it a typical product of the Anthropocene. Accurate scientific knowledge of natural dynamics forms the foundation for its sustainable management.

Contents

The apse explores the concept of '**anthropized nature**' in the Venetian lagoon, the result of centuries-long interaction between natural processes and human activity, analyzing various environmental, ecological, and management aspects:

1. Habitat and vegetation

The lagoon is a mosaic of habitats: mudflats, coastal dunes, and fishing valleys. The mudflats and seagrass meadows play key roles in sediment stabilization, water purification, and biodiversity.

2. Venice is (its) lagoon – Permeability between the city and the lagoon

The entire city depends on the lagoon's ecological processes: climate regulation, erosion protection, fishing, tourism, and culture. Artisanal fishing represents a sustainable model for resource use, with centuries-old traditions. It is a multispecies fishery, targeting 27 species, using traditional tools such as cogolli. In the past, Venice had a direct, daily relationship with the water.

Today, this bond is compromised by raised levels, embankments, and urban transformations. A study is proposed on the "permeability" of the city's shores, mapping the levels of access and interaction with the lagoon.

3. Plastic recovery

Innovative technologies and robotics to intercept floating waste before it reaches the open sea. The collected materials are reintegrated into a circular economy to produce new objects.

4. Yellow-legged gulls' management

The growth of the urban yellow-legged gull population in Venice has caused conflicts (noise, waste, damage). An integrated plan has included satellite and bell tower monitoring, new waste management (door-to-door), and awareness campaigns.

5. Reclamation of Cavallino-Treporti

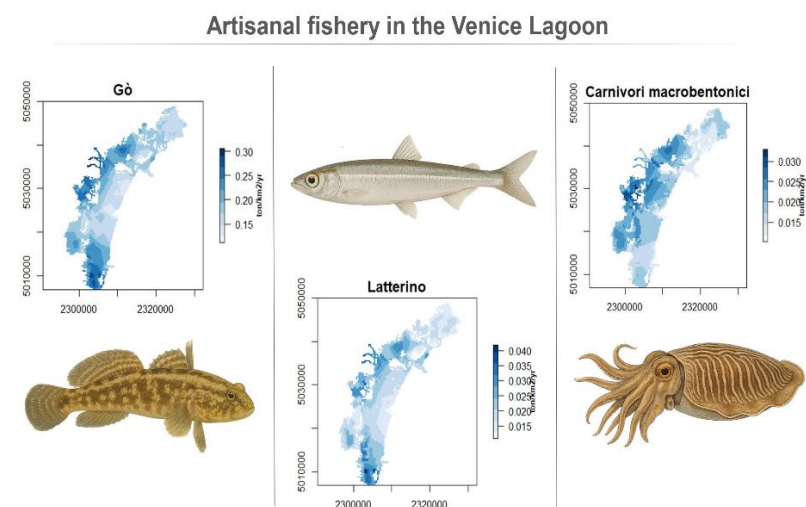
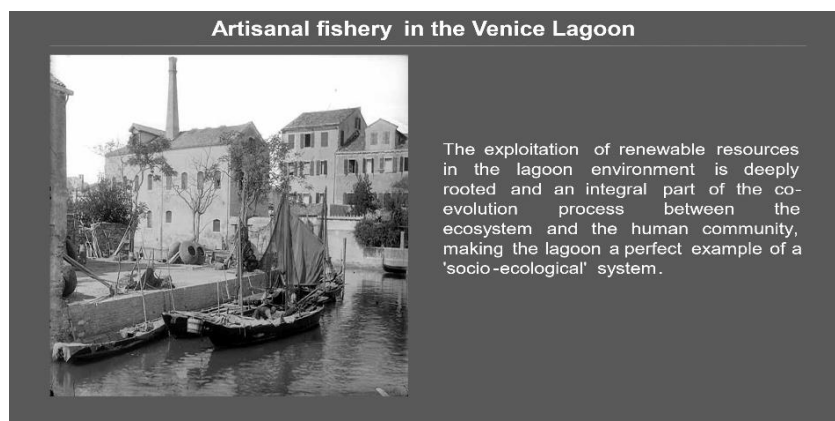
This presents the extensive agricultural reclamation between 1930 and 1933, which transformed a marshy area at the edge of the lagoon into a productive zone with new roads, rural buildings, and crops. Today, this area is one of the main European destinations for outdoor tourism.

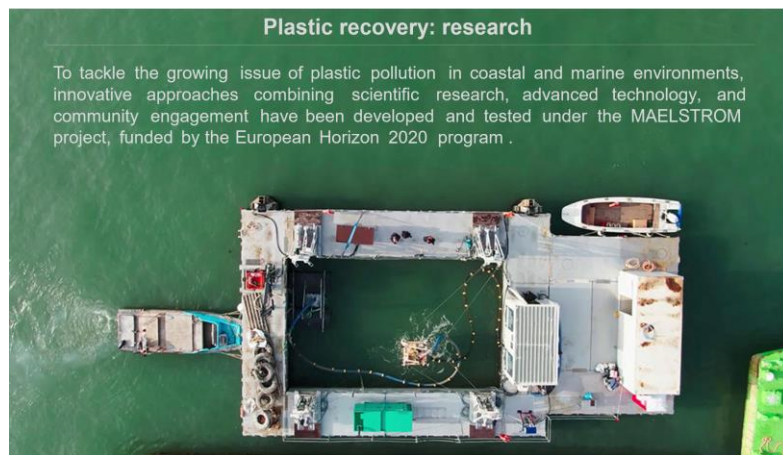
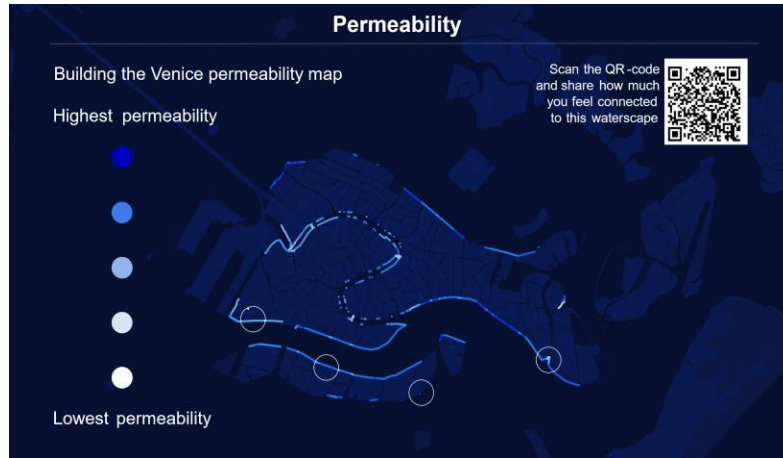
6- Agriculture

Some lagoon islands have always been dedicated to agricultural practices to meet the nutritional needs of this unique city. Even today, they host niche productions, highly valued in the market.

CORILA, ISMAR-CNR, Ca' Foscari University of Venice, Coldiretti, and the Municipality of Cavallino-Treporti have provided the rich material for this section.

Examples of images from the touchscreen





Apse 4 "Venice of the people"

Abstract

Like every other capital of a pre-unified Italian state, Venice expanded beyond its walls during the modern era. If the city is a projection of the community that inhabits it, then it is the *civitas*, **the city of the people**, that delineates the **real functional boundaries** of Venice, surpassing the material limits of the walls and buildings (*urbs*). Today, the Venetian *civitas* is expressed through the interaction of nearly a **million individuals**, involving both lagoon settlements and mainland settlements within a single functional area. The Venetian uniqueness is given by the lagoon, the walls of Venice, which sometimes act as a connector and sometimes as an obstacle to the flow of interaction between the different parts. The ability to measure these flows across a large area is essential for their sustainable management.

Contents

This section is dedicated to the **functional dimension of Venice** and aims to offer a representation of the anthropic phenomena that characterize it, describing the ways in which the city is experienced by its people, whether they are permanent residents, commuters who travel daily to work or study, or those who arrive from all over the world to visit. The goal is also to provide the visitor with an idea of the intelligence at the service of the people, that is, the complex organizational machine, the means, and technologies employed to ensure the livability and safe enjoyment of the City for all its **city users**.

The images that scroll on the LED wall next to the apse represent the digital depiction of some phenomena related to the use of the delicate urban fabric of Venice by its people. The density of people on the municipal territory, the number of entries and exits through the main pedestrian gates of the ancient city, the distribution of water buses serving people on the waterways, and the monitoring of boats transiting through the canals are concrete examples of the capabilities and tools that Venice has developed to analyze phenomena and ensure the balance between the city of the people and its fragile urban ecosystem.

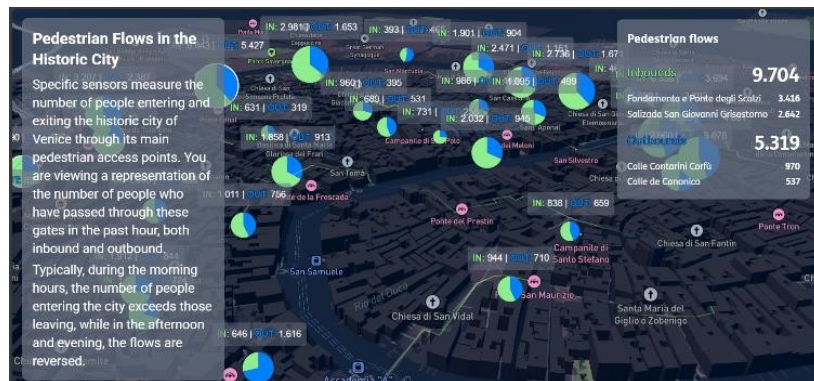
At the center of the apse, the "touch screen" monitor allows the visitor to interact with some informational scenarios built from data generated by mobile phone cells, in aggregated and fully anonymized form. In particular, the analyzable contexts are as follows:

- **Venice beyond Venice:** A geographical and dimensional view of functional Venice, identified as the area corresponding to the daily commuter basin of the city, extending beyond its administrative boundaries to embrace the territories of fourteen neighboring municipalities.
- **The City that Breathes:** The representation of the cycle of inflows and outflows from the city that people describe every day with their movements, like a breath at regular intervals.

- **The World in Venice:** A tangible measure of how the city welcomes visitors from all over the globe, a melting pot of languages and cultures united by their common interest and love for Venice.
- **Living Venice:** A representative look at the different “categories” of city users and the urban functions related to them, which intertwine across the Venetian territory.
- **Staying in Venice:** A view of how tourists visiting Venice choose to stay in the ancient city, but also on the Lido and in mainland accommodations.

The Municipality of Venice provides the content of its Control Room, with the collaboration of Venis, TIM, and VSF for their elaboration and presentation

Examples of images from the touchscreen



Apse 5 “Urban Form”

Abstract

The urban form of Venice has evolved while preserving some original insights and achievements, which remain legible to this day. Through historical illustrations, archival documents, and textual descriptions, this section presents some of the most significant aspects of the history of the Venetian archipelago.

Contents

An immersive experience to rediscover the role of the islands in building the lagoon city

The apse “Urban form” proposes a new exploration of the islands of the Venetian lagoon, interpreted as fundamental—though now largely forgotten—elements in the historical, political, environmental, and cultural process that made Venice a one-of-a-kind city. The installation takes the form of a multimedia and immersive device designed to tell the millennia-long story of these minor territories in a concise yet multifaceted way. For centuries, they formed the backbone of the urban, productive, and symbolic life of the Serenissima.

Today, the over sixty Venetian islands are often abandoned, marginalized, or transformed into tourist destinations stripped of memory. Yet they represent a rich and complex historical fabric that deserves to be reinterpreted through a proactive vision of the lagoon landscape’s protection and enhancement. *Venice is Archipelago* seeks to refocus attention on these spaces, presenting them as nodes in a historical network that is integrated and interdependent with the urban center—capable of telling a broader, more intricate, and vibrant story of Venice.

The exhibition is organized as a small yet autonomous digital installation, made up of an interactive touchscreen table and a synchronized projection wall. This setup allows the visitor to freely navigate various thematic paths, selecting chapters to explore more deeply through a model of “experiential zapping.” Each section combines historical documents, archival images, animations, concise texts, and video reconstructions, offering an immersive and informative experience that merges historical storytelling with contemporary technology.

One of the main storylines focuses on the role of the islands as sources of food and water: for centuries, vegetable gardens, vineyards, and wells were the only means of sustenance for a city lacking agricultural land. Other sections recount the islands’ uses as religious communities, health stations during plague outbreaks, military outposts defending against sea attacks, or as sites for public ceremonies and diplomatic receptions. The islands were also places of arrival for foreign communities fleeing persecution—Armenians, Jews, Cretans—who found refuge and rebirth in the lagoon, leaving deep traces in the material and spiritual culture of the city.

A central part of the installation is the interactive map of the lagoon, enabling a space-time journey through five centuries of transformations. While navigating the entire water basin, users can zoom in on individual islands, compare their ancient and current

morphology, discover vanished buildings, and consult documentary sources. This tool provides a powerful visualization of the lagoon landscape's historical density and its continuous mutation under the pressure of natural events, political decisions, and economic dynamics.

The setup is completed by a narrative video projected in one of the exhibition rooms. Designed for simultaneous viewing by multiple visitors, the film brings together the main stories from the interactive device, serving also as educational material for future presentations in national and international settings. The aim is to raise awareness among institutions—such as UNESCO, FAO, or the Ministry of Foreign Affairs—about the value and fragility of the lagoon heritage, prompting new scenarios for active conservation and cultural regeneration.

Aligned with the goals of the program, *Intelligent Venice* proposes an “intelligent” approach to urban memory, blending historical research, technological innovation, and design thinking. The Venetian archipelago thus emerges as a living, complex system to be understood, inhabited, and protected in its entirety—moving beyond the idea of an isolated, idealized historic center. The islands reclaim their role as functional and symbolic hinges, able to narrate a plural, ecological, and dynamic Venice, where the landscape is not a backdrop, but the protagonist.

The immersive installation is curated by Ludovica Galeazzo, scientific director of the ERC project “Venice’s Nissology. Reframing the Lagoon City as an Archipelago”. Created in collaboration with studio camerAnebbia of Milan and with the support of the Ministry of Foreign Affairs and International Cooperation and Venice International University (VIU), this Apse is a unique experience in which visitors can immerse themselves and retrace a millenary history.

The Venetian Abacus

Developed along the central axis of the Tesa, the **Venetian Abacus** is dedicated to the "**Ingenuities**"—the ingenious devices—and showcases the objects, tools, mechanisms, and technologies through which the Venetians transformed an apparently uninhabitable place into one of the most significant examples of global urban history.

Visitors can consult archival documents and photographs detailing the urban development of Venice over the centuries. Through specific architectural constraints—seemingly rigid but in fact enabling—it becomes clear how such limits have fostered exceptional creativity.

This section explores Venice as a technical and cultural system, the outcome of continuous collective invention, where architecture, engineering, and the environment are uniquely intertwined. Through original drawings and archival images, a material narrative of the lagoon city is presented—founded not on solid ground, but on mud, water, and ingenuity. Each exhibit element represents a concrete, historically layered response to extreme environmental conditions, revealing how fragility can give rise to innovation.

The guiding image is that of a Venetian abacus, a kind of technical memory board where each device, construction detail, or functional solution acts as a "unit of measurement" for the city's environmental intelligence. Venice is portrayed as an organism designed to endure: despite adverse conditions, every part—small or monumental, temporary or permanent—contributes to a dynamic balance between nature and the built environment.

The exhibition highlights a series of devices selected to demonstrate the breadth and depth of Venetian technical knowledge. Some are well-known, like the public and private cisterns, engineered to collect and filter rainwater in the absence of freshwater sources. Hidden beneath courtyards and squares, these cisterns function as natural filters with layers of sand and charcoal and include central wells that served both practical and civic functions.

At the other end of the technological timeline lies MOSE (Modulo Sperimentale Elettromeccanico), the experimental electromechanical system initiated in the late 1970s to protect the lagoon from high tides. The mobile barriers installed at the port inlets of Chioggia, Malamocco, and Lido, along with elevated quays and reinforced shorelines, represent today's most advanced technological response to rising sea levels.

Between these two poles, the exhibition explores numerous intermediate solutions. Timber piles, made of larch or oak and driven into the soft ground, form the foundation of the city. The waterlogged environment prevents wood from decomposing, making these foundations incredibly long-lasting. Above them rise flexible and lightweight structures: Venetian terrazzi (monolithic lime, sand, and crushed tile floors) that absorb ground movement without cracking, or Venetian chimneys, designed to shield fire from wind, promote ventilation, and reduce indoor humidity.

Also central to the exhibit are devices for lagoon containment and protection. Steel sheet piles, driven vertically into the ground, are used to stabilize banks and act as temporary

or permanent hydraulic barriers. Submerged breakwaters, concrete structures on the seabed, dissipate wave energy, aiding sand deposition and counteracting coastal erosion. Lunate breakwaters, curved artificial reefs, slow incoming currents and help protect inner ecosystems. These work in tandem with natural and artificial formations such as dunes, shaped by wind and waves, and groynes, stone or concrete structures extending into the water to reduce coastal drift and stabilize beaches.

These devices never work in isolation. They are always part of an integrated system, where technical function merges with architectural quality, landscape, and daily life. Consider, for example, *altane and liagò*—elevated terraces and glazed loggias that capture sunlight and encourage air circulation, transforming the harsh climate into a living resource. Or the ship-hull ceilings (*soffitti a carena di nave*), lightweight timber structures that reduce lateral forces in Gothic churches while also imparting symbolic character to sacred spaces.

Together, these elements form a coherent and adaptive technical vocabulary, where each feature results from contextual intelligence. Venice does not present itself as an abstract model, but as an evolutionary organism, where solutions have multiplied over time in response to emerging needs. Ingenuity is not confined to a single grand project, but distributed across countless small, often invisible, yet vital devices.

The "table of ingenuity" thus proposes a vision of Venice as a technical abacus: a grid of design solutions that collectively generate a city capable of resisting, adapting, and reinventing itself. The exhibition invites visitors to rediscover this wealth of material knowledge not as relics of the past, but as a living archive—ready to be drawn upon to face contemporary challenges like climate change, resource scarcity, and the need to build in harmony with the environment.

More than a celebration, this section is a call to interpretation: an opportunity to see the city with new eyes, decoding its technical details as traces of a shared knowledge—rooted in practice, observation, maintenance, and continuous adaptation. Like an abacus, this knowledge doesn't merely record; it suggests new combinations, new solutions, and new balances between humans and nature.

Università Iuav di Venezia has contributed to the Venetian Abacus.

Actors of today and tomorrow

The section "**Actors of today and tomorrow**", displayed along the connecting walls between the Absides of Intelligences, holds equal importance within the exhibition. It showcases ongoing and developing projects led by a diverse range of public and private stakeholders operating in the city. *The Actors are the following, in alphabetical order:*

- *Almaviva*
- *Assicurazioni Generali*
- *Autorità di Sistema Portuale dell'Adriatico Settentrionale - Porti di Venezia e Chioggia*
- *Conservatorio di Musica Benedetto Marcello Venezia*
- *Enfinity Global*
- *Eni*
- *Ferrovie dello Stato Italiane*
- *Fincantieri*
- *Fondazione Diabete e Ricerca*
- *Mare Technopark*
- *Microsoft Italia*
- *Procuratoria di San Marco*
- *Regione del Veneto*
- *TIM*

The initiative is also supported by Alilaguna, Camera di Commercio Venezia Rovigo, Fondazione di Venezia.