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Best Practices Examples

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Uffizi Gallery, Florence

Spreading tourists in time



The **Uffizi Gallery** in Florence is a museum renowned for its collection of Italian Renaissance art. It is a highly popular tourism destination and has **more than 2 million visitors a year**. This results in **long waiting times and queues**.



Source: <https://isiflorence.org/guide-uffizi-gallery-museum-florence-visit/>

INITIATIVE AND DEVELOPMENT

- Museum took the initiative
- Algorithm developed by computer science experts at the University of L'Aquila in central Italy

RESERVATION SYSTEM

- Gallery experiments with advanced reservation systems
- System based on two data analytics models: predictive and prescriptive
- Determines entry time for each visitor based on various factors (Weather, time of day, low or high season, number of tour groups)
- Sophisticated algorithm calculates the best time for individual visits
- Visitors take tickets from machines, assigning them a specific visiting time
- Tested system significantly reduces visitor queue times

INFRASTRUCTURE REQUIREMENTS

- Minimal hardware and software infrastructure needed
- Financial resources required to build the algorithm and accompanying infrastructure
- Reservation system needs adjustments to accommodate changes



EFFICIENCY AND WAITING TIMES

- System maximises efficiency for visitation
- Cuts waiting times for visitors
- Electronic reservation systems are common, but Uffizi's system is dynamic and smart

DATA-DRIVEN SOLUTIONS

- Data-driven solutions improve current systems
- Digital infrastructure required
- System enhances reservation and visit efficiency

LIMITATIONS

- Not a wonder cure
- Very busy attractions may not benefit as much

DESTINATION LEVEL DEVELOPMENT

- Ideally, advanced systems developed on a destination level
- Not implemented in this instance

A scenic view of Besalú, Spain, featuring a large stone bridge with a central tower and a flag, overlooking a river and a hillside town.

Besalú, Spain

Spreading tourists in space



The historic **center of Besalú** is attractive because of its level of **conservation** and **authenticity**. Its layout, however, is challenging for tourism as it is composed of narrow streets on a hill as well as by historic walls and the Fluvià River. This makes the use of **public space in the city centre** a critical issue.



STAKEHOLDERS

- Involvement of municipal government, private companies, residents, and local stakeholders.

INITIATIVE

- Participatory process initiated by the municipal government in 2011.
- Identified tourism and heritage issues.
- Implemented regulations for better mobility and parking.

COLLABORATION AND IMPROVEMENTS

- Collaboration with private companies to enhance guided tours.
- Extended schedules and introduced self-guided tours.
- Monuments extended opening hours, developed festive and cultural itineraries, and created the green ring route.



COOPERATION IMPACT

- Cooperation with the private sector resulted in new offers.
- Improved the overall quality of tourist experiences.

SUCCESS IN TOURISM RANKING

- Besalú now ranks high as an inland tourism destination.
- Increased attractiveness to visitors, even in the low season.

BALANCING RESTRICTIVE MEASURES

- Example of combining restrictive measures with increasing activities and experiences.



Source: <https://tourtravelandmore.com/tours/spain/barcelona-en/private-medieval-route-barcelona/>

CHALLENGES

- Residents needed time to adapt to restrictions and understand their necessity.
- Highlighted the difficulty of managing these changes.

SMOOTH MOBILITY AND ENVIRONMENTAL IMPACT

- Need to find ways for residents and tourists to move smoothly throughout the town.
- Addressing environmental impacts of increased mobility.

Souq Waqif , Doha, Qatar

Spreading tourists in time





Souq Waqif, a key tourist destination in Qatar, underwent **significant restoration between 2006 and 2008**, preserving its historical significance and adding features like art galleries and restaurants. Despite its charm, visitors face **navigation challenges due to limited signage and unclear entrances**, emphasizing the need for additional signage. Effective **crowd management** is crucial for tourist satisfaction and safety during high-demand periods or emergencies.



DATA MANAGEMENT

- Collaboration between Qatar University and the University of Melbourne to assess crowd flows at Souq Waqif using the Pedestride® Crowd Simulation tool.
- Use of Pedestride® software to model visitor behavior during evacuation and optimize visitor streams.

SUSTAINABLE MOBILITY AND ACCESSIBILITY

- Challenges in navigating Souq Waqif due to limited signage and unclear entrances.
- Emphasis on the need for additional signage for improved wayfinding.

INFLUENCING BEHAVIOR

- Crowd management is crucial for tourist satisfaction, optimized visitor circulation, and addressing safety concerns, especially during high-demand or emergency situations.

SIMULATION AND CROWD DYNAMICS

- Pedestride® software used to understand visitor behavior during evacuations.
- Models show that crowds tend to take similar routes during increased demands and emergencies.
- Maximum crowd density could reach up to 6 p/m² at gates and junctions.



Source: https://www.tripadvisor.com/Attraction_Review-g294009-d1768661-Reviews-Souq_Waqif-Doha.html

EXIT STRATEGIES AND MITIGATION

- Dynamic exit signs needed to direct flows to clear exits during high-demand situations to avoid herding effects.
- Simulation assists in evaluating evacuation plans, considering time, exit locations, and the possibility of stampedes.

CHALLENGES AND FUTURE WORK

- Collection of Souq Waqif layout and visitor data for future simulation improvements.
- Calibration and validation of models may be challenging in certain places.
- Current simulation focused on evacuations, not directly applicable for other purposes.

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Thanks!

