Smart Stay Santiago de Compostela Platform

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Introduction

Santiago de Compostela, the capital of the Galicia region, is a historic city in northwest Spain, renowned as the culmination point of the Camino de Santiago pilgrimage route, which ends at the impressive Cathedral of Santiago de Compostela. The city is a major cultural and spiritual destination, attracting many visitors [2].

In 2016, a comprehensive survey highlighted the main attractions that draw visitors to the city. Fig. 1 shows that 76.7% of tourists come primarily to visit the iconic Cathedral and its surroundings, reveling in the architectural splendor and spiritual ambiance that the area offers. The historic complex, encompassing a wealth of ancient buildings and cultural treasures, attracts 60% of the city's visitors, demonstrating the profound historical interest that defines Santiago de Compostela.
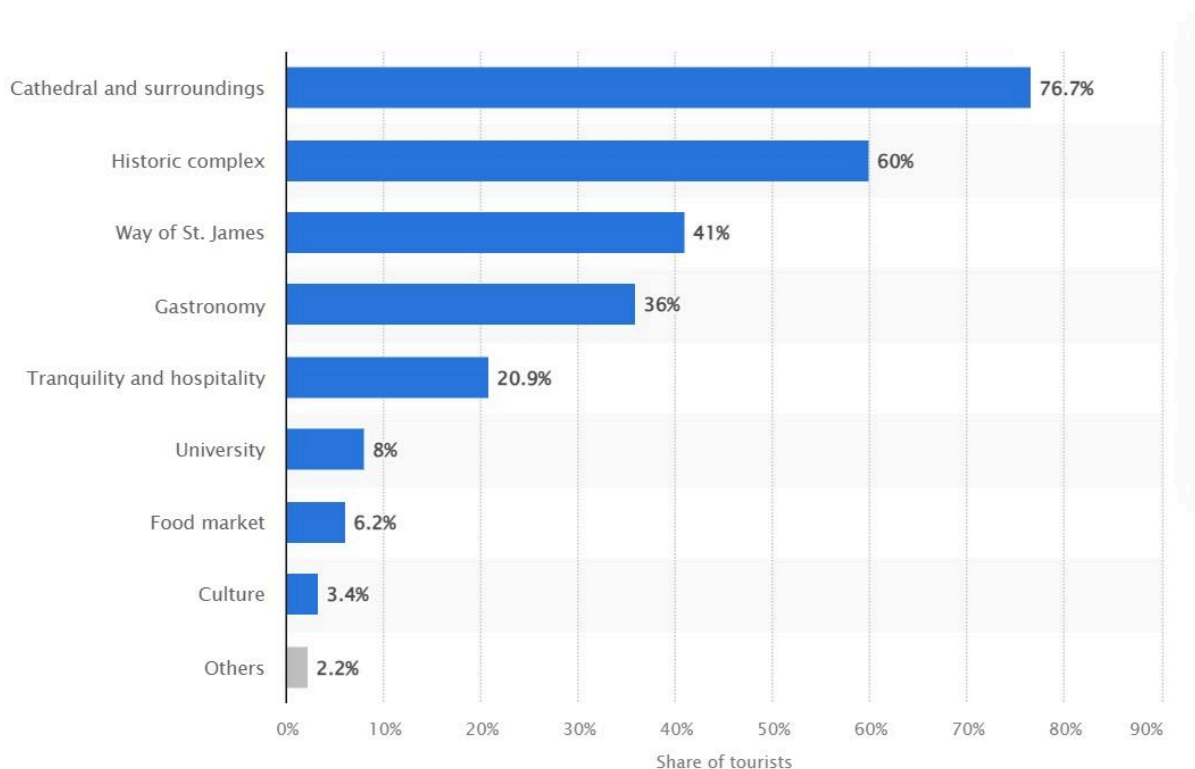

Figure 1 - Main tourism reasons in Santiago de Compostela in 2016[1]

Smart Stay Santiago de Compostela is a dedicated digital platform designed to enhance the experience of tourists visiting Santiago de Compostela while ensuring compliance with local accommodation regulations. By registering on the platform, tourists receive a QR code,

which is essential for obtaining the pilgrim certificate and accessing various local discounts and services. This initiative not only simplifies the process of legal compliance for tourists and accommodation providers but also fosters a safer and more enjoyable environment for both visitors and residents.

Problem Definition

The amount of tourists in Santiago de Compostela is raising a challenge when tourists stay in non-regulated apartments, leading to disturbances such as excessive noise and improper waste disposal. There is a clear need for a robust solution to systematically record and regulate tourist apartments to comprehensively address these concerns, which ensure that all accommodations comply with local standards, thus maintaining the city's tranquility and order.

Solution Rationale

The Smart Stay Santiago de Compostela platform is a comprehensive digital solution designed to streamline the registration and verification of tourists in city accommodations. It adeptly tackles essential challenges in managing and regulating tourist accommodations throughout the city, by facilitating a more efficient incident response by providing law enforcement with a comprehensive list of registered tourist accommodations, which speeds up the police response to noise and waste management complaints.

Additionally, this system not only upholds legal standards but also enhances the overall visitor experience in the city. Serving as a vital link between tourists, local businesses, and municipal authorities, the platform fosters a harmonious operational environment.

Key objectives of the platform include:

- **Providing a Mandatory Registration Tool**: This feature facilitates compliance with accommodation regulations, ensuring all tourist lodgings meet city standards.
- **Supporting Local Authorities**: By enabling efficient regulation and monitoring, the platform assists local authorities in maintaining public order and safety, ensuring that the city remains a welcoming and secure destination for visitors.
- **Offering Seamless Connections**: The platform enhances the economic and cultural benefits of tourism by seamlessly connecting tourists with local services, enriching their stay and supporting local commerce.

Stakeholder Impact

The stakeholders below are benefited by the Smart Stay Santiago de Compostela:

- **Municipal Authorities** have a more streamlined approach to monitoring and enforcing accommodation regulations.
- **Local Residents** experience fewer disturbances and a more orderly community environment.
- **Tourists** enjoy added benefits during their stay.
- **Local Businesses** benefit from increased patronage and promotional opportunities targeted at tourists.

Solution Architecture

The stakeholders either produce or consume services with respect to the Smart Stay Santiago de Compostela. Figure 2 presents the different stakeholders and their respective descriptions that are involved in the business domain. Two different categories of end users are identified.
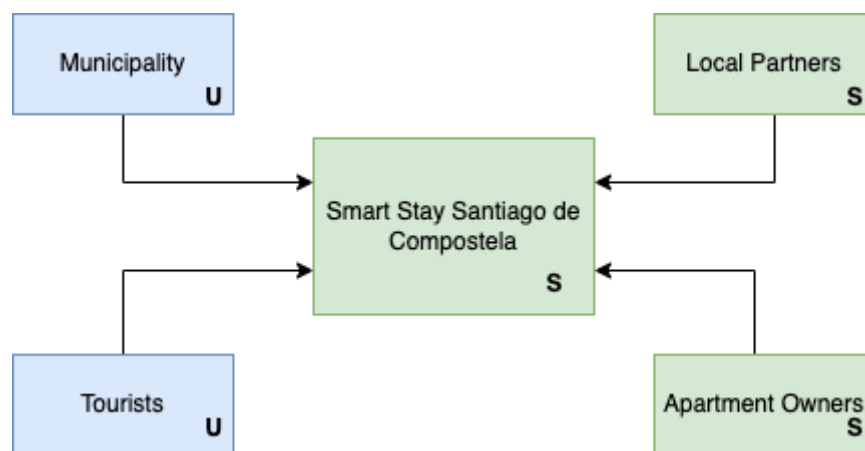

Figure 2 - Business Domain Model

The component diagram is shown in Figure 3. On the tourist view, the Registration and Verification Component sends data to the Database Management Component to store registration details and receives back validation for generating QR codes. QR Code Generator Component relies on validated registration data to create QR codes, which are then stored and managed by the Database Management Component. The QR can be used in partner business for pilgrim certificates, discounts in establishments, and such.

Database Management will compare the housing registered by the tourists with the licensed apartments in API house listing systems (such as AirBnB[3] or Booking.com). When the

database management systems find an unlicensed house registered by a tourist, it will invoke the Notification API to send notifications to municipal authorities. Notifications may include alerts about unregistered accommodations, confirmation of registrations, or other important information.
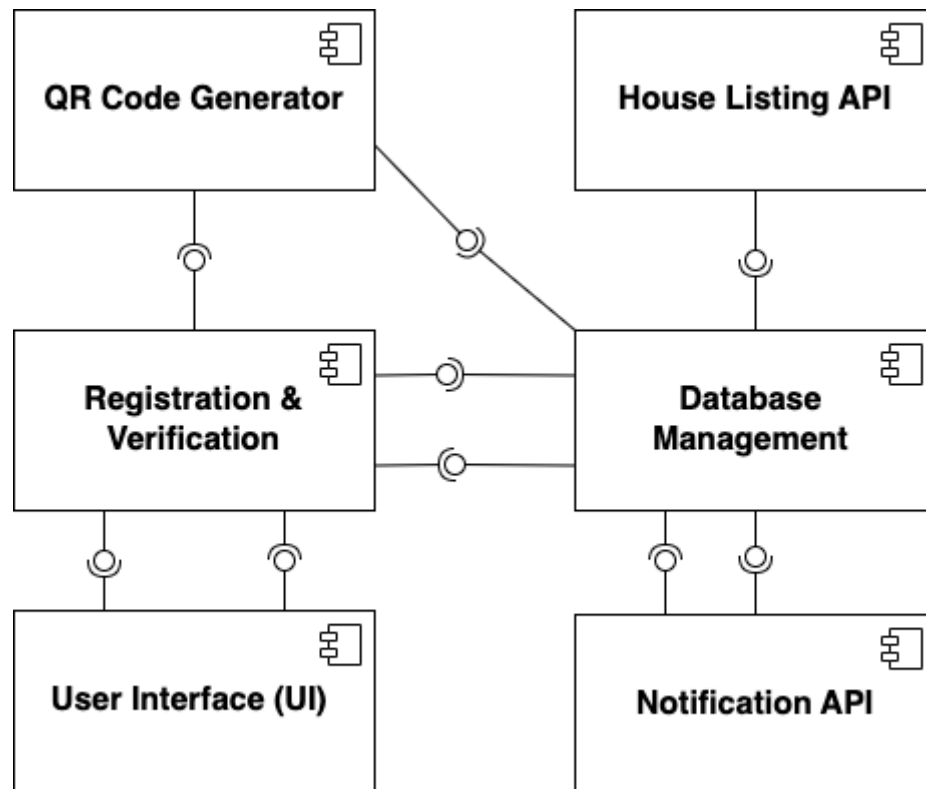

Figure 3 - Component Diagram

Prototype and System Workflow Explanation

Instead of regulating by documenting apartment landlords, our approach aims to entice tourists to register where they stay. The system will facilitate tourist registration, whereby tourists will register their accommodations daily and receive a QR code that can be used for various benefits:

- Discounts at museums, bars, restaurants, and other attractions.
- Requirement for obtaining a Pilgrim certificate.
- Mandatory for attending conferences and other university projects.

Since these three activities account for more than 90% of visits to Santiago (Figure 1), this strategy will effectively capture the majority of tourists and their accommodations.

Figure 4 - Tourist Registration Page

Additionally, the municipality will verify the registered addresses. If any address provided by tourists is not listed with the government, the system will generate notifications and reports of the unlisted tourist apartments. Government officials can then inspect these properties, and if they are found to be operating as unlisted tourist apartments, penalties can be imposed by the police.

This dual strategy of offering benefits and imposing penalties will encourage the proper registration of tourist apartments. Simultaneously, it will promote local businesses, such as bars and restaurants, through the discounts provided.
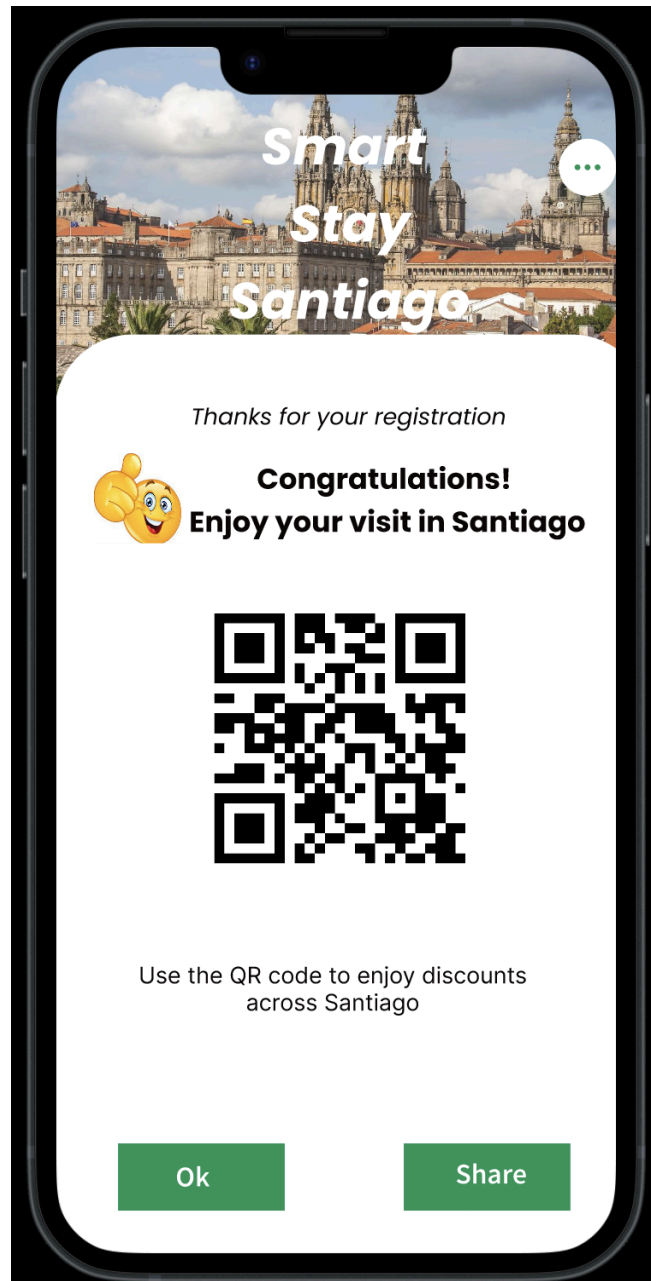
Figure 5 - QR code is received by tourists after they register the place they stay during their visit to Santiago de Compostela. The QR Code can be used for pilgrim services, university access, cultural and historical site visits, and other attractions and restaurants.

Core Features and Functionalities

1. Enhance Regulatory Compliance

- **Automated Registration and Compliance Checks**: The platform automates the process of monitoring tourist accommodations and conducting compliance checks against unlisted tourists apartments. This feature reduces manual oversight, minimizes human error, and ensures all accommodations adhere to safety, noise, and occupancy standards.

2. Facilitate Efficient Monitoring

- **Centralized Monitoring Dashboard**: Municipality authorities have access to a centralized dashboard that provides a reporting of tourists that stay in unlisted tourists apartments. This tool allows for quick assessments and focused inspections as needed.
- **Real-Time Updates and Alerts**: It keeps municipality authorities updated with tourists that are staying in places that are not yet listed as tourists apartments, via real-time notifications.

3. Improve Tourist Experience

- **QR Code System for Easy Access and Verification**: Upon registering, tourists receive a QR code that serves as their digital pass for various services and attractions. This code can be scanned to verify accommodation, access discounts at local businesses, and even serve as a ticket for cultural and historical sites.

4. Support Local Businesses

- **Partnership Opportunities**: The platform enables local businesses to partner and list their services, offering promotions and discounts to tourists who show their QR codes. This increases their visibility and attracts more customers.
- **Analytics and Feedback Tools**: Businesses gain access to analytics tools that provide insights into customer behavior and preferences. This data can be used to optimize offerings and improve service.

Sustainability Considerations

Our solution addresses several sustainable development goals. First, the hackathon solution aligns with SDG 11, focusing on sustainable cities and communities. By regulating unlisted tourist apartments, we address issues like noise and waste, ensuring compliance with local standards. This promotes adequate, safe, and affordable housing services, contributing to a harmonious urban environment and sustainable urban development in Santiago de Compostela. The solution also supports SDG 8, focusing on decent work and economic growth. The QR code generation, offering benefits, serves as an advertisement for local businesses, thereby stimulating economic activity. Moreover, by promoting technological upgrades and compliance with regulations, our solution enhances economic productivity in the city. Moreover, the solution targets SDG 17 by fostering effective partnerships among public, private, and civil society sectors in Santiago de Compostela. This includes municipalities, local businesses, churches, landlords, and household neighbors collaborating to regulate and manage tourist accommodations. By promoting policy coordination and coherence, our approach contributes to sustainable development goals through inclusive and collaborative efforts.

Additionally, our solution supports SDG 9, which is about industry, innovation and infrastructure, by increasing access to information and communications technology in Santiago de Compostela. Then, the solution promotes SDG 16 by fostering accountable and transparent institutions as it reduces illicit financial flows and ensures equal incomes for landlords using regulated solutions. Finally, our solution contributes to SDG 10 by empowering and promoting the social, economic, and political inclusion of all stakeholders in Santiago de Compostela.

Figure 5 - SDG-s

Accordingly, our solution addresses all five dimensions of sustainability by leveraging technology, fostering social cohesion, stimulating economic growth, ensuring environmental responsibility, and empowering individuals. Technically, we promote technological upgrades and the use of QR codes, enhancing access to information and communications technology. Socially, we regulate tourist apartments to manage noise and waste, ensure safe and affordable housing, and promote the inclusion of all stakeholders. Economically, we stimulate local business activity, enhance economic productivity, and ensure equal incomes for landlords. Environmentally, we address waste management through effective apartment regulation. Individually, we empower landlords and stakeholders by fostering compliance and promoting political and economic inclusion.

Conclusion

Smart Stay Santiago de Compostela represents a strategic initiative to leverage digital technology for enhancing tourist experiences, ensuring regulatory compliance, and promoting local economic activities in Santiago de Compostela. This platform not only facilitates a smoother integration of tourists into the local community but also ensures that tourism has a positive impact on the city's cultural heritage and public services. By connecting various stakeholders through a single, user-friendly platform, Smart Stay Santiago de Compostela sets a new standard for managing tourist accommodations and enhancing the sustainability of urban tourism.

Reference

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