HOTEL MANAGEMENT SYSTEM

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1.Executive Summary

1.1 Project Overview

The Hotel Management System (HMS) project has a goal to create an all-inclusive software program that will automate and streamline a variety of hotel functions, hence boosting guest satisfaction, staff productivity, and overall efficiency. The system would combine important features including housekeeping, billing, reservations, front desk operations, and reporting onto a single platform, giving hotels an effective management tool. Hotels nowadays are focusing on maximizing their revenues as all other businesses do and the main reason for that is the ever-increasing competition. The online world has made it difficult for hotels and resorts to compete by providing guests a plenty of choices including Homestay, Hostel with bunk beds or even a modular option. Therefore, there is an increasing demand for best hotel management system to facilitate the management of hotel operations and functions. Operating a successful hotel business today is a challenge. A hotelier must manage various of proposals such as operations, staff and maintenance, meanwhile keeping costs under control and balances as it is one of the most important and critical issues for a hotel business to increase their revenues and to compete with other hotels. To improve the efficiency of this process, a good hotel management system which uses the modernizing techniques must be provided. The key to reaping the benefits of an effective hotel management software system is to select the right one for your property. It's critical that you know exactly what this hotel management technology is, and why it is important for you to implement it at your hotel. These days every person can find different options of the hotel reservation software free on the internet, however one must judge the solution with the quantum of features and quality that it is providing. There should be a complete functionality as a hotel management system can be both basic and advanced based on the pricing options that are available as well. Also, we can say that the developers are making such software as per the pocket of the business and this is one of the main reasons why we have so many different options in the online world. Hotel management is a key element for a very important branch of economy, which is tourism. Knowing this, two members of our group were familiar with different types of management software, and they had analysed the deficiencies that they have and decided to make this project based on the improvement of these deficiencies. Our software aims to have all the features that a hotel needs to adapt to the management structure of the business, and by making practical and effective use of these features every hotelier's work life will be much easier than they have ever imagined by using this product.

2.Product/Service Description

Hotels nowadays differ in size, culture and management structure. So, the perfect Software provided, needs to be adapted to specific business which will implement and use it. Hotel Management System is a web application which aims to facilitate the management system of a hotel. It will keep track of hotel reservations, rooms to be cleaned and so much more.

2.1 Product Context

With the use of this technology, hotel owners and operators may increase both short- and long-term bookings while streamlining administrative work with the help of the Hotel Management System (HMS). HMS is a crucial component of the entire visitor experience, not only for daily operations. The hotel management system must improve the customer experience with the brand from the start of the guests' online booking process to the end of their stay and their feedback after they return home. The goal of this solution is to unite all potential Hotel stakeholders while providing flexibility and streamlining the management process. The primary goals of the product are reliability and ease of use.

2.2 User Characteristics and their Goals

User	Characteristics	Goals
Admin	Administrator of the HMS (Hotel Management System).	- See booked rooms. - Add/Remove users. - Observe statistics and inventory.
Front Desk	Handles guest check-ins, check-outs, and phone calls.	- View rooms to be cleaned. - View available rooms for customers. - Handle check-ins/check-outs. - Make and view reservations. - Access notifications.
Guest	Users interested in making reservations at the hotel.	- Make bookings. - View if room is ready for stay. - Modify booking details (dates, times). - Edit credentials.

Housekeeping	Employees responsible for cleaning rooms.	- See rooms to be cleaned. - Update room cleaning status (e.g., ready or not).
Manager	Person responsible for operational aspects of the hotel.	- View performance metrics and reports. - Integrate marketing channels.
Accounting	Responsible for invoicing and billing.	- Manage invoicing and billing processes.
Facilitators	Provide required inventory for the hotel.	- Receive messages or send messages about inventory needs.
Staff Sponsored	Users with special privileges and access rights for administrative actions.	- Perform administrative tasks. - Approve certain transactions.
Suppliers	Third-party vendors providing goods/services	- Interact with the system for procurement, stock management, and service delivery.

2.3 Assumptions

1. All users' needs to have basic knowledge in English language and can know other language;

2. All users have basic knowledge in computer and smartphone usage;

3. Stakeholders of the hotel have basic knowledge on how to use the system due to previous experiences with other systems;

4. Hotel is equipped with PC/Laptop/Tablet, printer, mobile phone;

5. Hotel must have internet connection all the time;

6. It is assumed that the Hotel provides Credit Card and Cash payments.

2.4 Constraints and Dependencies

1.All users must be logged in to use the product and to access the information

2. The system must follow all Albanian and international legal restrictions, regarding aviation regulations set by certain institutions.

3.Requirements

Requirements are the conditions or capabilities that a software system must have to satisfy the needs of its users, stakeholders, and the business. They define what the system should do and how it should perform, providing a clear framework for design, development, and testing. Requirements are essential for guiding the entire development process and ensuring the software meets its intended purpose.

3.1 Functional Requirements

Req#	Requirement	Comments	Priority	Date	SME Approved
BR_L R_01	Login Constraint.	All users have to be logged in	1	5/2/2025	Erta Llenga,Esta Cekrezi,Artemisa Hasalami,Ester Pashtranjaku,Megi Almadhi,,Arsildo Veliu,Brikena Papadhopuli
BR_L R_02	Different Views for different controllers	Depending on the user level	1	5/2/2025	Erta Llenga,Esta Cekrezi,Artemisa Hasalami,Ester Pashtranjaku,Megi Almadhi,,Arsildo Veliu,Brikena Papadhopuli
BR_L R_03	Add/Remove users	The admin can add or remove users	1	5/2/2025	Erta Llenga,Esta Cekrezi,Artemisa Hasalami,Ester Pashtranjaku,Megi Almadhi,,Arsildo Veliu,Brikena Papadhopuli
BR_L R_04	View booked rooms and check-in/check-out date	The admin and front desk have the ability to view booked rooms and check- in/check-out date	1	5/2/2025	Erta Llenga,Esta Cekrezi,Artemisa Hasalami,Ester Pashtranjaku,Megi

					Almadhi,,Arsildo Veliu,Brikena Papadhopuli
BR_LR_05	The system should provide email notifications	The client will be notified with an email for each successful booking	2	5/2/2025	Erta Llenga,Esta Cekrezi,Artemisa Hasalami,Ester Pashtranjaku,Megi Almadhi,,Arsildo Veliu,Brikena Papadhopuli
BR_LR_0 6	Provide statistics	The admin can view a statistics tab	3	5/2/2025	Erta Llenga,Esta Cekrezi,Artemisa Hasalami,Ester Pashtranjaku,Megi Almadhi,,Arsildo Veliu,Brikena Papadhopuli
BR_LR_0 7	Room Assignment	Assigning rooms based on preference	2	5/2/2025	Erta Llenga,Esta Cekrezi,Artemisa Hasalami,Ester Pashtranjaku,Megi Almadhi,,Arsildo Veliu,Brikena Papadhopuli
BR_LR_0 8	Notification Handling	E-mail system integrated and notifications regarding check-in/check-out or guest requests are accessible	2	5/2/2025	Erta Llenga,Esta Cekrezi,Artemisa Hasalami,Ester Pashtranjaku,Megi Almadhi,,Arsildo Veliu,Brikena Papadhopuli
BR_LR_0 9	Reporting	Managers can access reports	2	5/2/2025	Erta Llenga,Esta Cekrezi,Artemisa Hasalami,Ester Pashtranjaku,Megi Almadhi,,Arsildo Veliu,Brikena Papadhopuli

BR_ LR_ 1 0	Performance Metrics	Manager can see employee performances in a graphical manner	2	5/2/2025	Erta Llenga,Esta Cekrezi,Artemisa Hasalami,Ester Pashtranjaku,Megi Almadhi,,Arsildo Veliu,Brikena Papadhopuli
BR_ LR_ 11	Room Availability	Front Desk can see if room is available or not	1	5/2/2025	Erta Llenga,Esta Cekrezi,Artemisa Hasalami,Ester Pashtranjaku,Megi Almadhi,,Arsildo Veliu,Brikena Papadhopuli
BR_ LR_ 12	View Payment	Accounting can view payment	1	5/2/2025	Erta Llenga,Esta Cekrezi,Artemisa Hasalami,Ester Pashtranjaku,Megi Almadhi,,Arsildo Veliu,Brikena Papadhopuli
BR_ LR_ 13	Print Invoice	System prints daily, monthly, Or yearly invoices	1	5/2/2025	Erta Llenga,Esta Cekrezi,Artemisa Hasalami,Ester Pashtranjaku,Megi Almadhi,,Arsildo Veliu,Brikena Papadhopuli
BR_ LR_ 14	Monitor Occupancy and Revenue	Manager can see occupancy rates and revenue/revenue projections	1	5/2/2025	Erta Llenga,Esta Cekrezi,Artemisa Hasalami,Ester Pashtranjaku,Megi Almadhi,,Arsildo Veliu,Brikena Papadhopuli
BR_ LR_ 15	Market Segmentation	Manager can apply market segmentation based on guest preferences	2	5/2/2025	Erta Llenga,Esta Cekrezi,Artemisa Hasalami,Ester Pashtranjaku,Megi Almadhi,,Arsildo Veliu,Brikena

					Papadhopuli
BR_LR_16	Notify Housekeeping	Notify housekeeping staff based on required rooms to be cleaned	1	5/2/2025	Erta Llenga,Esta Cekrezi,Artemisa Hasalami,Ester Pashtranjaku,Megi Almadhi,,Arsildo Veliu,Brikena Papadhopuli
BR_LR_17	Notify Guest on room status	Guest gets notified on if room is cleaned	2	5/2/2025	Erta Llenga,Esta Cekrezi,Artemisa Hasalami,Ester Pashtranjaku,Megi Almadhi,,Arsildo Veliu,Brikena Papadhopuli
BR_LR_18	User Account Creation	User creates account based on credentials	1	5/2/2025	Erta Llenga,Esta Cekrezi,Artemisa Hasalami,Ester Pashtranjaku,Megi Almadhi,,Arsildo Veliu,Brikena Papadhopuli
BR_LR_19	Reservation Modification	Guest can modify reservation date or specific reservation request	1	5/2/2025	Erta Llenga,Esta Cekrezi,Artemisa Hasalami,Ester Pashtranjaku,Megi Almadhi,,Arsildo Veliu,Brikena Papadhopuli
BR_LR_20	Feedback Submission	Guest submits feedback after stay. Feedback provided by the client is successfully recorded and stored in the system for analysis	3	5/2/2025	Erta Llenga,Esta Cekrezi,Artemisa Hasalami,Ester Pashtranjaku,Megi Almadhi,,Arsildo Veliu,Brikena Papadhopuli

BR_LR_21	Cancellation Request	Guest can request cancellation before due date	1	5/2/2025	Erta Llenga,Esta Cekrezi,Artemisa Hasalami,Ester Pashtranjaku,Megi Almadhi,,Arsildo Veliu,Brikena Papadhopuli
BR_LR_22	Schedule Maintenance	Facilitators can schedule maintenance for inventory	2	5/2/2025	Erta Llenga,Esta Cekrezi,Artemisa Hasalami,Ester Pashtranjaku,Megi Almadhi,,Arsildo Veliu,Brikena Papadhopuli
BR_LR_2 3	Block dates for specific rooms	Some rooms may need to be renovated thus guests should not be able to book those rooms	1	5/2/2025	Erta Llenga,Esta Cekrezi,Artemisa Hasalami,Ester Pashtranjaku,Megi Almadhi,,Arsildo Veliu,Brikena Papadhopuli
BR_LR_24	Room Service Ordering	Guests should be able to order room service from their account.	1	5/2/2025	Erta Llenga,Esta Cekrezi,Artemisa Hasalami,Ester Pashtranjaku,Megi Almadhi,,Arsildo Veliu,Brikena Papadhopuli
BR_LR_25	Loyalty Program Managment	The system should track loyalty points and apply discounts for frequent guests	2	5/2/2025	Erta Llenga,Esta Cekrezi,Artemisa Hasalami,Ester Pashtranjaku,Megi Almadhi,,Arsildo Veliu,Brikena Papadhopuli

BR_LR_26	Lost and Found Management	Staff should be able to log and manage lost and found items reported by guests	3	5/2/2025	Erta Llenga,Esta Cekrezi,Artemisa Hasalami,Ester Pashtranjaku,Megi Almadhi,,Arsildo Veliu,Brikena Papadhopuli
BR_LR_27	Social Media Integration	Guests should be able to share reviews and experiences directly from the system	3	5/2/2025	Erta Llenga,Esta Cekrezi,Artemisa Hasalami,Ester Pashtranjaku,Megi Almadhi,,Arsildo Veliu,Brikena Papadhopuli
BR_LR_28	Mobile Check-in and Check-out	Guests should be able to check in and check out via mobile without visiting the front desk	1	5/2/2025	Erta Llenga,Esta Cekrezi,Artemisa Hasalami,Ester Pashtranjaku,Megi Almadhi,,Arsildo Veliu,Brikena Papadhopuli
BR_LR_29	Guest Profile Management	The system should store guest preferences for future visits	2	5/2/2025	Erta Llenga,Esta Cekrezi,Artemisa Hasalami,Ester Pashtranjaku,Megi Almadhi,,Arsildo Veliu,Brikena Papadhopuli
BR_LR_30	Emergency Alerts	The system should notify all guests and staff in case of emergencies	1	5/2/2025	Erta Llenga,Esta Cekrezi,Artemisa Hasalami,Ester Pashtranjaku,Megi Almadhi,,Arsildo Veliu,Brikena Papadhopuli

BR_LR_31	Digital Key Access	The system should have the option to use a digital key through their mobile device	2	5/2/2025	Erta Llenga,Esta Cekrezi,Artemisa Hasalami,Ester Pashtranjaku,Megi Almadhi,,Arsildo Veliu,Brikena Papadhopuli
BR_LR_32	Secure Guest Verification	The system should implement identity verification for secure check-in	1	5/2/2025	Erta Llenga,Esta Cekrezi,Artemisa Hasalami,Ester Pashtranjaku,Megi Almadhi,,Arsildo Veliu,Brikena Papadhopuli

3.2 Non-Functional Requirements

3.2.1 Product Requirements

Category	Requirement
User Interface Requirements	A simple and responsive system in a short time.
	Web app, consistent in all interfacing screens or devices.
	Details of any user (Client, Admin, Receptionist) will be activated in the displayed mode and in the database really quick.
	The system shall also provide dedicated interfaces for additional user roles:
	- Staff: Including various categories (e.g., front desk, housekeeping, management) with dashboards and navigation tailored to their daily tasks.
	- Suppliers: With access to modules for inventory updates, order tracking, and supply chain data.
	- Sponsors: With specialized interfaces for managing sponsorship content, viewing performance reports, and handling advertisement details.
	Flexible navigation to and from displayed panels or pages.
Usability	Every user of this Web application will be able to interact with it easily from any device using an internet connection, regardless of the browser or platform.
	Each user will have a unique interface, complete with features and functions, to use.
	To make the software easily accessible, the most crucial commands for each kind of interface will be visible at first view.
	The design will facilitate future modifications, as it will need to be updated frequently to meet hotel management requirements and handle potential error occurrences.
Learnability	Our product is user-friendly – everyone can easily learn the commands following the guidelines provided by us.
	Even though the software is in English, it can be understood by someone with basic knowledge of English since every functionality

	will be graphically shown.
	Training materials and tutorials will be provided for all user types—including staff, suppliers, and sponsors—to ensure they understand their specific functionalities.
Efficiency Performance Requirements	95% of the booking transactions shall be processed in less than 2 seconds during normal workload conditions.
	90% of the booking transactions shall be processed in less than 3 seconds during peak workload conditions.
	The system shall handle up to 1,000 check-in and check-out tasks per hour during normal workload conditions.
	The system shall handle up to 500 check-in and check-out tasks per hour during peak workload conditions.
	The system shall process up to 5 GB of data per day under normal workload conditions.
	The system shall process up to 10 GB of data per day under peak workload conditions.
	95% of the standard reports (e.g., daily occupancy report) shall be generated in less than 5 seconds.
	90% of the complex reports (e.g., annual financial report) shall be generated in less than 30 seconds.
Dependability	The website will ensure to be available all the time, every day 24/7. It will have a high availability to achieve the highest possible percentage of time the system is functioning.
	Even though it is in English, the system can be used worldwide as it is a web application, the same for the Android application.
	Our product will have downtime as minimal as possible as long as the software will be used with reliable web browsers.
	The software will be evaluated often. In case of errors, the administrator will be able to follow specific validations because everything will be well documented in files.
	The system is maintainable and usable, made in a form that later on if required it can be improved by adding more functionalities.
	The system will be updated continuously with different and extra features based on guest reviews and business requirements.

	Moreover, the software will be observed and maintained by the administrator of the system. In case there is any error in the system, a message will appear informing users to be patient while the system is being maintained.
	The system will implement strong data validation and security measures to protect guest information and ensure data accuracy.
	Regular audits and security checks will be conducted to maintain data integrity and compliance with privacy standards.
Security	Our web application ensures that users and client applications are identified and that their identities are properly verified.
	Ensures that users and client applications can only access data and services for which they have been properly authorized.
	Detects attempted intrusions by unauthorized persons and client applications.
	Ensures that unauthorized malicious programs do not infect the application or component.
	Ensures that parties to interactions with the application or component cannot later repudiate those interactions.
	Ensures that confidential communications and data are kept private.
	Enables security personnel to audit the status and usage of the security mechanisms.
	Ensures that applications and centres survive attack, possibly in degraded mode.
	Ensures that centres and their components and personnel are protected against destruction, damage, theft, or surreptitious replacement.

3.2.1.2 Additional Product Non-Functional Requirements

Category	Requirement
Scalability	The system shall be designed to support growth in the number of users, transactions, and data volume over time.
	It should support horizontal scaling (adding more servers) and vertical scaling (upgrading existing hardware), along with effective load balancing strategies.
Extensibility	The architecture shall be modular to allow easy integration of new features or modules (such as additional supplier interfaces or third-party integrations) with minimal rework.
	The use of plug-in architectures or microservices is encouraged.
Maintainability (Detailed)	Beyond general maintenance, the system should adhere to coding standards, automated testing protocols, version control best practices, and continuous integration/continuous deployment (CI/CD) pipelines to facilitate smooth updates, bug fixes, and enhancements.
Disaster Recovery	A disaster recovery plan must be in place with clearly defined Recovery Time Objectives (RTO) and Recovery Point Objectives (RPO).
	Regular automated backups (with off-site storage) and procedures for rapid restoration after catastrophic failures must be documented and tested periodically.
Interoperability	The system shall support standard APIs (e.g., REST, SOAP) and common data exchange formats (such as JSON and XML) to facilitate seamless integration with external systems like payment gateways, supplier databases, and third-party applications.
Accessibility	In addition to overall usability, the system must comply with recognized accessibility standards (such as WCAG 2.1) to ensure that it is fully usable by individuals with disabilities.
	This includes support for screen readers, keyboard navigation, and appropriate colour contrasts.
Reliability and Fault Tolerance	The system must incorporate fault-tolerant mechanisms and redundant components to ensure continuous operation even in the event of component failures.
	Error handling routines and self-healing processes should be implemented to minimize service disruption.

Energy Efficiency	The system should be optimized for energy efficiency by utilizing resource optimization strategies and efficient algorithms.
	This not only minimizes operational costs but also supports the organization's sustainability goals.

3.2.2 Organizational Requirements

Category	Requirement
Environmental Requirements	Hardware Compatibility: The system must be compatible with the organization's existing hardware infrastructure, including servers, workstations, and mobile devices.
	Operating Environment: The system should operate efficiently in the organization's current network environment, including LAN, WAN, and wireless networks.
	Sustainability: The system must adhere to the organization's environmental sustainability policies, including energy-efficient operations and electronic waste reduction.
Operational Requirements	Process Standards: The system must align with the organization's standard operating procedures and business processes, including guest check-in/check-out, booking management, and billing.
	User Training: Training programs must be provided to ensure that staff can effectively use the system. Training should also extend to suppliers and sponsors if they have direct interaction with the system, ensuring that each user group understands their specific processes.
	Support and Maintenance: The system should include provisions for ongoing support and maintenance, with defined SLAs for issue resolution.
Development Requirements	Coding Standards: Developers must adhere to the organization's coding standards and best practices to ensure code quality and maintainability.
	Documentation: Comprehensive documentation must be provided, including user manuals, technical documentation, and API references. Documentation should include role-specific guides for staff, suppliers, and sponsors, detailing how each group interacts with the system.

3.2.3 External Requirements

Category	Requirement
Regulatory Requirements	Compliance: The system must comply with all relevant industry regulations, such as PCI DSS for payment processing and GDPR for data protection.
	Audit Trails: The system must maintain detailed audit trails for all transactions, including user actions, changes to guest information, and financial transactions.
Ethical Requirements	Data Privacy: The system must ensure the privacy and confidentiality of guest data, in accordance with the organization's data privacy policy.
	Transparency: The system must provide transparent processes for data handling, allowing guests to understand how their data is used and stored.
	Non-discrimination: The system must ensure fair and equal access for all users, without discrimination based on race, gender, or other factors.
Legislative Requirements	Data Protection: The system must adhere to data protection laws, such as GDPR or CCPA, ensuring guest data is stored securely and used appropriately.
	Taxation Compliance: The system must correctly calculate and apply local taxes and fees in accordance with regional tax laws.
	Health and Safety: The system must support compliance with health and safety regulations, including any requirements for guest health data collection in response to pandemics.

3.2.3.3.1 Accounting Requirements

Category	Requirement
Financial Reporting	The system must generate financial reports that comply with accounting standards and regulations.
Transaction Logging	All financial transactions must be logged with before and after values to facilitate auditing and ensure accuracy.

3.2.3.3.2 Security Requirements

Category	Requirement
Access Control	The system must implement robust access control mechanisms to ensure only authorized personnel can access sensitive information.
Data Encryption	All sensitive data must be encrypted both in transit and at rest to protect against unauthorized access.
Incident Response	The system must include procedures for incident detection, response, and reporting to handle potential security breaches effectively.

3.2.4 Domain Requirements

Category	Requirement
General Domain Requirements	Only admin can create, update, and delete employees.
	If the sign-up option is clicked in the web application, the user will be of type "Guest" of the hotel.
	In addition to the above, the system must support dedicated user roles for:
	- Staff: Who will perform day-to-day operations such as guest management and housekeeping updates.
	- Suppliers: Who will be able to update and track inventory and supply deliveries.
	- Sponsors: Who, if granted access, can manage sponsor-related content and view associated performance data.
	Rooms to be cleaned are automatically assigned to the worker by the system; if the worker is absent on a specific day, its work will be distributed to its coworkers.
	The user interface will be standard for all types of users. However, role-specific dashboards and functionalities will be implemented where necessary to accommodate the operational needs of staff, suppliers, and sponsors.
	The system should take into account the exact time of check-out of the leaving guest and check-in of the new guest in order to avoid collisions between bookings.
	The system should also take into account that there will be different currencies for online payments.