**Initial Design**

1. Revisit Nonfunctional Requirements

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| --- | --- | --- |
| Requirements Category | Subcategory | Requirement or Rationale for None |
| Operational | Technical Environment | 1.1 The system shall run on Windows 11 operating system client machines.  1.2 The system must be compatible with Microsoft Office Professional 2019 for potential data export/import functionalities (e.g., reports).  1.3 The system shall operate exclusively on designated hotel-owned computer workstations located within the hotel's internal network. |
|  | System Integration | 2.1 The system must allow manual entry/update of payment status based on information from the hotel's separate payment processing system.  2.2 The system should provide a mechanism (e.g., screen alert, email trigger) to notify managers about bookings requiring approval for catering changes. |
|  | Portability | 3.1 The system is designed for the Windows 11 environment on internal hotel workstations only. No requirement exists for portability to other operating systems (e.g., macOS, Linux) or for mobile device access. |
|  | Maintainability | 4.1 System code shall be documented to facilitate understanding and future modifications by IT staff or contractors.  4.2 The system should incorporate error logging to capture critical failures for troubleshooting by IT support. |
| Performance | Speed | 5.1 The system shall process and display results for room availability queries within 2 seconds under peak load conditions. |
|  | Capacity | 6.1 The system shall support simultaneous use by up to 4 booking specialists during peak hours without performance degradation.  6.2 The database must be sized to accommodate projected booking volume and customer data for at least 5 years. |
|  | Availability  and Reliability | 7.1 The system should achieve 99.5% uptime during standard hotel operational hours (e.g., 7 AM - 10 PM daily).  7.2 Regular automated database backups (at least daily) must be performed and stored securely according to hotel IT policy. |
| Security | System Value | 8.1 The system contains sensitive customer PII and valuable booking/revenue data; security measures must reflect this high value to prevent financial and reputational damage. |
|  | Access Control | 9.1 Access requires unique user logins (username/password) for accountability. <  9.2 Role-based access control will differentiate Booking Specialist functions from Manager functions (e.g., catering approvals, system configuration). |
|  | Encryption/Authentication | 10.1 Sensitive customer data (PII) stored in the database shall be encrypted at rest.  10.2 User authentication credentials (passwords) must be securely hashed and salted. |
|  | Virus Control | 11.1 The system must function correctly on workstations protected by the hotel's standard enterprise antivirus software and security policies (patching, firewalls). |
| Cultural and Political | Multilingual | 12.1 The user interface for hotel staff will be in English only, as this is the primary operational language. (Requirement 4.1 relates to *handling* time data, not UI language). |
|  | Customization | 13.1 Managers must be able to customize room descriptions, features, capacities, and base rental prices through a settings interface.  13.2 The system shall accommodate predefined discount rules applicable by staff. |
|  | Unstated Norms | 14.1 Canceled bookings must be retained in the system (marked as 'canceled') for reporting and auditing, not permanently deleted.  14.2 The User Interface should be intuitive, adopting standard Windows application design conventions. |

1. Acquisition Strategy

This project's system is designed to be fully internal and on-premise. Therefore, a combination strategy of customer development and package purchases is a good option based on cost, security, time constraints, and long-term maintenance.

Justification for this strategy:

- Using built software for core functionalities ensures timely delivery of the project. The project can be secure, well-supported, and integrated with industry standards by implementing Oracle's products.

- In order to meet the system’s needs, some critical processes will be built in-house, such as UI and automation. These functionalities will be essential and unique for the Cowboy Hotel.

- By combining, this approach provides an optimal balance of cost, flexibility, and time constraints.

1. Hardware/ Software Specification

|  |  |  |  |
| --- | --- | --- | --- |
|  | STANDARD CLIENT | standard application server | standard database server |
| operating system | - Windows 11 Pro | - Windows Server 2022 | - Windows Server 2022 |
| special software | - Microsoft Office Professional 2019 | - Microsoft IIS | - Oracle |
|  |  |  |  |
| hardware | * Intel Core i7 processor * 16GB RAM * 512GB SSD * 27-inch LED Monitor | - Intel Xeon processors  - 2TB SSD  - 64GB RAM | - Intel Xeon processors  - 2TB SSD  - 64GB RAM |
| network | - LAN | - LAN | - LAN |

1. Update to Cost/Benefit Analysis

Estimated Cost of Each Piece of Hardware:

- HP EliteDesk 800 G6 = $799

- HPE ProLiant DL380 Gen10 Server = $3,201.78

- Samsung 27" T35F Series FHD Monitor = $149.99

Estimated Total Cost of Hardware:

- 2 HPE ProLiant DL380 Gen10 Server = $3,201.78 \* 2 = $6,403.56

- 2 HP EliteDesk 800 G6 = $1,598

- 2 Samsung 27" T35F Series FHD Monitor = $149.99 \*2 =$299.98

- Total Cost of Hardware = $8,301.54

Estimated Cost of Each Piece of Software:

- Microsoft IIS (Internet Information Services): $972

- Microsoft SQL Server: Server License = $989, Client License = $230/user

- Microsoft Office Professional 2019 = $440

Estimated Total Cost of Software:

- Microsoft IIS = $972

- 1 Server License = $989

- 4 Client License = $230 \* 4 = $920

- Microsoft Office Professional 2019 = $440

- Total Cost of Software = $ 3,321