**Waterfall Deliverables – Part -1/2**

**Question 1**

Document 1 Business case document template

**Answer**

Why is this project initiated?

- This cancer hospital management system project represents a strategic digital transformation initiative driven by several critical factors. Based on the document, the project aims to fundamentally revolutionize how cancer care is managed, documented, and delivered. The initiative recognizes that cancer treatment has unique and complex requirements that general hospital systems may not adequately address.

The project is being initiated to create a specialized electronic ecosystem that understands the distinctive needs of oncology care, including chemotherapy scheduling, radiation therapy tracking, and the long-term monitoring that cancer patients require. This specialization is crucial because cancer treatment protocols differ significantly from general medical care, involving multiple treatment modalities, complex scheduling, and extended patient journeys that may span years.

Furthermore, the project recognizes that improving operational efficiency in cancer care isn't just about cost savings—it directly impacts patient outcomes. Delays in treatment scheduling, miscommunications between specialists, or errors in treatment protocols can have serious consequences for cancer patients whose care is often time-sensitive.

What are the current problems?

­- ***Excessive administrative burden on medical staff***: Doctors and nurses are spending too much time on paperwork rather than direct patient care. This administrative overhead reduces the quality time healthcare providers can spend with cancer patients who often need both medical attention and emotional support.

***Complicated appointment scheduling processes***: Cancer treatment often requires coordinating multiple appointments across different departments (radiology, chemotherapy, consultations), making scheduling particularly complex and prone to errors.

***Suboptimal resource management***: In cancer care, resources include not just physical assets but also specialized staff time, treatment room scheduling, and expensive medication management.

***Disconnected systems across departments***: The ripple effect suggests information obstruction between departments, causing coordination challenges that affect treatment timing and potentially patient outcomes.

***Lack of cancer-specific digital infrastructure***: Standard hospital management systems may not account for the specialized workflows of oncology care, such as managing complex chemotherapy protocols, or monitoring long-term patient progress.

With this project how many problems could be solved?

-

* The specialized oncology EHR backbone will streamline documentation, reducing administrative burden on medical staff while maintaining the specialized information needed for cancer care.
* The patient portal will solve multiple problems simultaneously by enabling self-service appointment scheduling, providing access to medical records, facilitating communication with the care team, and giving patients visibility into their treatment plans.
* The integrated digital infrastructure connecting various hospital departments will eliminate information silos, improving coordination between specialists and departments involved in cancer treatment.
* Resource management features will optimize allocation of critical resources, reducing delays and wastage that currently impact operational efficiency.
* Success metrics in the document target a 40% reduction in patient wait times and 50% decrease in administrative task time, suggesting the system aims to solve at least half of the efficiency problems.
* Specialized cancer treatment tracking capabilities will address the unique needs of oncology workflows that general systems cannot handle effectively.

What are the resources required?

- ***Human Resources***: A diverse team of 19 specialists including:

* System architects for designing the infrastructure
* Developers for building various modules
* QA engineers for ensuring system reliability
* Clinical Subject Matter Experts (SMEs) to align the system with medical practices

***Financial Resources***: The largest portion of the budget is allocated to software development, reflecting the system's complexity. The budget is set to Rs. 2,50,00,000 which suggests significant investment in creating specialized oncology functionality.

***Technical Infrastructure***:

The system requires robust infrastructure for handling sensitive medical data, suggesting investments in:

* Secure servers and networking equipment
* Data storage solutions
* Backup and disaster recovery systems

***Time Resources***:

The project follows a waterfall methodology spanning 18 months, divided into five phases:

* Requirements gathering
* System design
* Implementation
* Testing
* Deployment

***Training Resources***:

Staff training and change management, indicating resources will be needed for:

* Developing training materials
* Conducting training sessions
* Providing ongoing support during the transition

***Clinical Expertise***: The involvement of oncologists, nurses, and administrative staff during the requirements gathering phase indicates significant time commitment from these stakeholders.

How much organizational change is required to adopt this technology?

-

***Workflow Transformation***: The shift from paper-based or fragmented digital systems to an integrated oncology-specific platform will fundamentally change how staff perform their daily tasks. A 50% reduction in administrative task time indicates significant workflow changes.

***Cultural Adaptation***: The staff training and change management suggests recognition that cultural resistance might be a challenge. Healthcare professionals often have established work patterns that can be difficult to change.

***Patient Relationship Evolution***: The patient portal introduces a new dynamic in the doctor-patient relationship, empowering patients to become more active participants in their treatment process. This represents a shift in how the organization interacts with patients.

***Interdepartmental Collaboration***: The interconnected nature of the system will require greater collaboration between previously siloed departments, necessitating changes in communication patterns and information sharing.

***Skill Development***: Staff will need to develop new technical skills to effectively use the system, requiring investment in training and potentially changes in job descriptions and responsibilities.

***Leadership Commitment***: The scale of the project suggests it will require sustained leadership support and possibly reorganization of certain management structures to oversee the new digital ecosystem.

Time frame to recover ROI?

-

* The project has a substantial implementation period of 18 months, suggesting significant upfront investment.
* The success metrics reduces patient wait times by 40% and decreases administrative task time by 50%.
* Resource optimization would reduce waste and improve utilization of expensive cancer treatment facilities and equipment.

Considering these factors, and typical healthcare IT investments of similar scale, estimated ROI recovery timeframe can be of approximately 3-5 years, with some benefits realized incrementally throughout the implementation and adoption phases. The substantial efficiency gains targeted (40-50% improvements) suggest the potential for faster ROI than typical healthcare IT projects, but the complexity of cancer care systems would likely extend the full payback period beyond the immediate implementation phase.

How to identify Stakeholders?

-

***Functional Analysis***: By examining each component of the system (EHR, scheduling, patient portal, pharmacy management, analytics), one can identify who interacts with these functions:

* Electronic Health Records: Oncologists, nurses, medical assistants, records department
* Scheduling: Administrative staff, treatment coordinators, patients
* Patient Portal: Patients, family caregivers, patient advocates
* Pharmacy Management: Pharmacists, oncology nurses who administer treatments
* Analytics: Hospital leadership, department managers, clinical researchers

***Impact Assessment***: The various impacts of the current system's inefficiencies, pointing to additional stakeholders:

* Those affected by treatment timing issues: radiation technologists, chemotherapy infusion staff
* Those involved in resource management: inventory managers, finance department
* Those responsible for patient outcomes: quality improvement teams, clinical directors

***Implementation Team***: The system architects, developers, QA engineers, and Clinical SMEs as part of the project team, all of whom are important stakeholders.

***External Stakeholders***: A complete stakeholder analysis would also include:

* Regulatory bodies overseeing medical data (implied by the emphasis on secure handling of medical information)
* Insurance companies that interface with billing systems
* Vendors of existing systems that will need to integrate with the new platform
* Hospital board members who would approve such a significant investment

**Question 2**

Document 2 BA strategy

**Answer**

***Business Analysis Approach Strategy for Cancer Hospital Management System (Waterfall Model)***

As a business analyst for a cancer hospital management system project following the waterfall methodology, I would implement a structured approach covering the entire project lifecycle. Here's a detailed explanation of my BA strategy:

Elicitation Techniques

I would apply multiple complementary techniques to gather comprehensive requirements:

1. *Document Analysis*:
   1. Review existing hospital policies, cancer treatment protocols, and regulatory requirements
   2. Analyse current system documentation to understand limitations
   3. Examine cancer-specific workflows and clinical pathways
2. *Stakeholder Interviews*:
   1. Conduct one-on-one interviews with department heads (Oncology, Radiology, Pharmacy)
   2. Interview IT staff about current system architecture and limitations
   3. Meet with executives to understand strategic objectives
3. *Observation Sessions:*
   1. Shadow clinical staff during cancer treatment workflows
   2. Observe administrative processes like appointment scheduling
   3. Monitor usage patterns of existing systems
4. *Requirements Workshops*
   1. Facilitate cross-functional workshops for shared modules
   2. Hold department-specific sessions for specialized cancer treatment requirements
   3. Conduct process mapping workshops to document current and future states
5. *Prototyping*
   1. Create UI mock ups for critical interfaces like the oncology treatment planning screen
   2. Develop workflow prototypes for complex processes
   3. Present interactive wireframes for the patient portal
6. *Focus Groups*
   1. Organize patient focus groups to understand portal requirements
   2. Conduct physician focus groups for clinical functionality needs
   3. Hold sessions with nurses regarding treatment administration workflows

Stakeholder Analysis

I would implement a two-pronged approach:

*Influence-Interest-Level of Support (ILS) Framework*

* Map each stakeholder based on their influence over project decisions
* Assess their interest level in project outcomes
* Evaluate their current support level (advocate to opponent)
* Develop targeted engagement strategies based on this analysis

*RACI Matrix Development*

* Create a detailed RACI for each deliverable and major decision point
* Clearly identify who is Responsible, Accountable, Consulted, and Informed
* Include key stakeholders like:
* Hospital leadership (CEO, CMO, CIO)
* Clinical directors (Oncology, Radiology, Pathology)
* Nursing leadership
* IT management
* Administrative directors
* Patient representatives
* Project team members

Documentation Strategy

I would create and maintain:

*Business Requirements Document (BRD) which will include:*

* Project background and cancer care context
* Current state assessment of oncology workflows
* Future state vision for integrated cancer management
* High-level requirements and success criteria

*Functional Requirements Specification (FRS)*

* Detailed module requirements for:
* Electronic Health Records (oncology-specific)
* Treatment planning and scheduling
* Patient portal with cancer journey tracking
* Pharmacy management for chemotherapy
* Billing and insurance processing
* Analytics and reporting
* User stories and use cases for each function

*Non-Functional Requirements*

* Performance specifications (99.9% uptime for critical functions)
* Security requirements (HIPAA compliance)
* Interoperability with laboratory and imaging systems
* Data retention policies for cancer treatment records

*Requirements Traceability Matrix (RTM)*

* Map requirements to business objectives
* Link requirements to test cases
* Track implementation status

*Process Flow Diagrams*

* Current and future state workflows
* System interaction models

Document Approval Process

* To ensure proper sign-off:
* Initial draft creation
* Stakeholder review with business units
* Final review before approval
* Formal Sign-off Procedure

Client Approval Strategy

To secure necessary approvals:

* Align approvals with waterfall methodology phases
* Demonstrate requirements fulfilment at each stage
* Monthly presentations of progress against requirements
* Formal approval documentation for each phase

Communication Channels

I would establish:

*Formal Communication*

* Weekly status meetings with project team
* Monthly executive updates
* Requirements review sessions
* Documentation repository with version control

*Daily Communication*

* Daily stand-up meetings during active phases
* Email updates for document changes

Change Request Management

I would implement:

* Standardized change request form
* Impact analysis procedure (scope, schedule, cost)
* Approval thresholds based on impact
* Implementation planning and verification
* Requirements update procedures
* Communication plan for approved changes

Progress Reporting

To keep stakeholders informed:

* Executive dashboard (one-page status summary)
* Detailed status reports for project team
* Department-specific updates
* Requirements completion metrics
* Weekly project status updates
* Bi-weekly stakeholder newsletters
* Monthly executive briefings

User Acceptance Testing (UAT)

For successful validation:

*UAT Preparation*

* Develop comprehensive test plan mapped to requirements
* Create test cases covering all critical functions
* Prepare test data including cancer treatment scenarios
* Set up dedicated testing environment
* Train users on testing procedures

*UAT Execution*

* Coordinate testing schedule with clinical staff availability
* Track test case execution and results
* Document defects with severity classification
* Conduct daily defect triage meetings
* Retest fixed defects

*UAT Sign-off Process*

Client Project Acceptance Form including:

* Test completion metrics
* Critical defect resolution status
* List of deferred items with resolution plan
* Formal sign-off from key stakeholders (clinical, administrative, technical)

**Question 3**

Document 3 Functional specifications

**Answer**

Functional Specifications:

|  |  |
| --- | --- |
| Project Name | Cancer Hospital Management System |
| Customer Name | Cancer Care Centre |
| Project Version | 1.0 |
| Project Sponsor |  |
| Project Manager |  |
| Project Initiation Date | 15-03-25 |

Functional Requirement Specifications:

|  |  |  |  |
| --- | --- | --- | --- |
| **Requirement ID** | **Requirement Name** | **Requirement Description** | **Priority** |
|  |  |  |  |
| FR001 | Login | Users should be able to securely log in to the system using their credentials with role-based access control. | 10 |
| FR002 | Password Management | System should support password reset, recovery, and enforced password policies (complexity, expiration). | 9 |
| FR003 | Multi-factor Management | System should support MFA for staff accessing sensitive patient information. | 8 |
| FR004 | User Role Management | Admin should be able to create, modify, and deactivate user accounts with specific role assignments. | 9 |
| FR005 | Patient Registration | Staff should be able to register new patients with demographic information, insurance details, emergency contacts, and medical history. | 10 |
| FR006 | Patient Search | System should provide robust search functionality to find patients by name, ID, phone number, or other identifiers. | 9 |
| FR007 | Schedule Appointment | Staff should be able to schedule patient appointments with providers, treatment sessions, or diagnostic procedures. | 10 |
| FR008 | Recurring Appointments | System should support scheduling recurring appointments for treatments like chemotherapy or radiation therapy. | 9 |
| FR009 | Appointment Reminders | System should generate automated appointment reminders via email, SMS, or patient portal. | 8 |
| FR010 | Lab Result Integration | System should interface with laboratory systems to import and display test results. | 9 |
| FR011 | Electronic Prescribing | Providers should be able to electronically prescribe medications. | 10 |
| FR012 | Patient Portal Access | Patients should be able to access their health information securely through a web portal. | 9 |
| FR013 | Appointment Viewing and Scheduling | Patients should be able to view upcoming appointments and request new appointments. | 8 |
| FR014 | Test Result Access | Patients should be able to view their laboratory and diagnostic test results. | 8 |
| FR015 | Insurance Verification | System should support electronic insurance eligibility verification. | 9 |
| FR016 | Financial Reporting | System should provide financial reports including revenue, outstanding balances, and claims status. | 8 |
| FR017 | Equipment Maintenance | System should track equipment maintenance schedules and history. | 7 |
| FR018 | Mobile Patient Portal | System should provide a mobile version of the patient portal. | 7 |
| FR019 | Research Data Collection | System should support structured data collection for research protocols. | 8 |
| FR020 | Research Consent Tracking | System should track research consents and protocol adherence. | 9 |

Priority Scale:

10: Must have

9: Very High Priority

8: High Priority

7: Medium Priority

6: Low Priority

**Question 4**

Document 4 RTM (Requirement Traceability Matrix)

**Answer**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Req**  **ID** | **Req Name** | **Req**  **Description** | **Design** | **D1** | **T1** | **D2** | **T2** | **UAT** |
| FR001 | Login | User must be able to login to access the application | Yes | Pending | No | Yes | Yes | YES |
| FR002 | Patient Registration | System shall allow staff to register new patients with personal and medical details | Yes | Yes | Yes | N/A | N/A | Yes |
| FR003 | Appointment Scheduling | System shall enable scheduling of patient appointments with doctors | Yes | Yes | Yes | N/A | N/A | Yes |
| FR004 | Medical Records Management | System shall maintain comprehensive medical records for each patient | Yes | Yes | No | Yes | Yes | Yes |
| FR005 | Treatment Planning | System shall allow oncologists to create and update treatment plans | Yes | Pending | N/A | Yes | Yes | Yes |
| FR006 | Medication Management | System shall track prescribed medications for patients | Yes | Yes | Yes | N/A | N/A | Yes |
| FR007 | Billing and Insurance | System shall generate bills and manage insurance claims | Yes | No | N/A | Yes | No | Pending |
| FR008 | Inventory Management | System shall track medical supplies and equipment | Yes | Yes | Yes | N/A | N/A | Yes |
| FR009 | Staff Management | System shall maintain records of hospital staff and their schedules | Yes | Yes | Yes | N/A | N/A | Yes |
| FR010 | Reporting | System shall generate various reports for administrative purposes | Yes | Pending | N/A | Yes | Yes | Yes |
| FR011 | Lab Results Integration | System shall integrate with laboratory systems to receive test results | Yes | No | N/A | Pending | Pending | Pending |
| FR012 | Patient Portal | Patients shall have access to a portal to view their information | Yes | No | N/A | Yes | No | Pending |
| FR013 | Radiology Integration | System shall store and display radiology images | Yes | Pending | N/A | Yes | Yes | Yes |
| FR014 | Notifications | System shall send automated reminders for appointments | Yes | Yes | Yes | N/A | N/A | Yes |
| FR015 | Radiation Therapy Tracking | System shall track radiation therapy sessions and dosages | Yes | No | N/A | Yes | Yes | Yes |
| NF001 | Security | System shall comply with healthcare data protection regulations | Yes | Pending | No | Yes | Yes | Yes |
| NF002 | Performance | System shall support at least 100 concurrent users | Yes | Yes | Yes | N/A | N/A | Yes |
| NF003 | Availability | System shall be available 24/7 with 99.9% uptime | Yes | N/A | N/A | Yes | Yes | Yes |
| NF004 | Backup | System shall perform automatic daily backups | Yes | Yes | Yes | N/A | N/A | Yes |
| NF005 | Compatibility | System shall be compatible with major browsers and operating systems | Yes | Yes | No | Yes | Yes | Yes |

**Question 5**

Document 5 BRD (Business Requirement Document)

**Answer**

***Cancer Hospital Management System***

***CHMS-2025***

***Version 1.0***

***Business Analyst***

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1. Document Revisions

|  |  |  |
| --- | --- | --- |
| **Date** | **Version Number** | **Document Changes** |
|  |  |  |
| 03-03-2025 | 0.1 | Initial Draft |
|  |  |  |

2. Approvals

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Role** | **Name** | **Title** | **Signature** | **Date** |
| Project Sponsor |  | Hospital Director |  |  |
| Business Owner |  | Chief Medical Officer |  |  |
| Project Manager |  |  |  |  |
| System Architect |  |  |  |  |
| Development Lead |  |  |  |  |
| User Experience Lead |  |  |  |  |
| Quality Lead |  |  |  |  |
| Content Lead |  |  |  |  |

3. RACI Chart for this document

The RACI chart identifies the persons who need to be contacted whenever changes are made to this document. RACI stands for responsible, accountable, consulted, and informed. These are the main codes that appear in a RACI chart, used here to describe the roles played by team members and stakeholders in the production of the BRD. They are adapted from charts used to assign roles and responsibilities during a project. (RACI Can be made for IT side [Project stakeholder] as mentioned above, apart from that Can also Be made for Client side [Business Stakeholder]).

The following describes the full list of codes used in the table:

*Codes Used in RACI Chart*

\* Authorize Has ultimate signing authority for any changes to the

document.

R- Responsible: Responsible for creating this document.

A- Accountable: Accountable for accuracy of this document (for example, the project manager)

S- Supports: Provides supporting services in the production of this document

C- Consulted: Provides input (such as an interviewee).

I- Informed: Must be informed of any changes.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Name** | **Position** | **\*** | **R** | **A** | **S** | **C** | **I** |
|  | Chief Medical Officer |  |  | A |  | C | I |
|  | Hospital Director | \* |  |  |  | C | I |
|  | Business Analyst |  | R |  | S |  |  |
|  | Project Manager |  |  | A |  |  | I |
|  | Head of Oncology |  |  |  |  | C | I |
|  | Head of Nursing |  |  |  |  | C | I |
|  | IT Director |  |  |  | S | C | I |
|  | Quality Assurance Lead |  |  |  |  | C | I |

4. Introduction

*4.1 Business Goals*

The Cancer Hospital aims to enhance patient care, improve operational efficiency, and maintain compliance with healthcare regulations through the implementation of a comprehensive Hospital Management System specifically designed for cancer treatment facilities.

Need:

* Centralized management of cancer patient information and treatment plans
* Streamlined operational processes to reduce administrative overhead
* Improved patient care through better access to comprehensive medical histories
* Enhanced compliance with healthcare regulations and standards

*4.2 Business Objectives*

To provide an IT solution for:

* Comprehensive patient management including registration, medical history, treatment plans, and follow-ups
* Appointment scheduling and management for various departments (oncology, radiology, chemotherapy, etc.)
* Electronic Medical Records (EMR) system specific to cancer treatment
* Billing and insurance management
* Pharmacy and medication management
* Laboratory and radiology integration
* Staff scheduling and management
* Inventory management of medical supplies
* Reporting and analytics for hospital performance and patient outcomes
* Patient portal for access to health information and communication

*4.3 Business Rules*

* All patient data must be stored in compliance with HIPAA regulations
* Access to patient information must be role-based and authorized
* Medical staff must document all patient interactions
* Prescription medication must be verified by at least two healthcare professionals
* Patient billing must follow insurance coding requirements
* Appointments must be scheduled with appropriate buffer times
* Lab results must be reviewed and signed off by authorized personnel
* Treatment plans must be approved by the oncology department head
* All system actions must be logged for audit purposes

*4.4 Background*

The Cancer Hospital has been operating with a combination of paper-based systems and disconnected software applications. This has led to inefficiencies, data silos, increased administrative overhead, and challenges in providing comprehensive patient care. The hospital administration identified the need for an integrated hospital management system specifically designed for cancer care to address these issues and improve overall operational effectiveness and patient outcomes.

*4.5 Project Objective*

The primary objective of this project is to implement a comprehensive Cancer Hospital Management System that will integrate all aspects of hospital operations from patient registration to discharge and follow-up. The system will:

* Centralize patient information and make it accessible to authorized personnel
* Streamline administrative processes to reduce paperwork and manual tasks
* Enhance clinical decision-making through comprehensive patient data
* Improve communication between different departments
* Reduce wait times and enhance patient experience
* Provide analytics for continuous improvement of care quality
* Ensure compliance with healthcare regulations

*4.6 Project Scope*

4.6.1. In Scope Functionality

* Patient management (registration, demographic information, medical history)
* Electronic Medical Records (EMR) specific to oncology patients
* Appointment scheduling and management
* Treatment plan creation and management
* Medication management and prescription
* Laboratory management and results integration
* Radiology management and imaging integration
* Billing and insurance processing
* Inventory management for medical supplies
* Staff scheduling and management
* Patient portal for information access
* Reporting and analytics dashboard
* User management with role-based access controls
* System integration with existing laboratory and radiology equipment
* Mobile application for doctors to access patient information

4.6.2. Out Scope Functionality

* Telemedicine/virtual consultations
* Research management module
* Clinical trial management
* Biobank management
* Genetic testing and genomic data analysis
* Third-party app integrations (except essential medical equipment)
* Staff payroll and HR management
* Patient transportation scheduling
* Facility management
* Content management system for hospital website

5. Assumptions

* Hospital staff will be available for requirements gathering and training
* Necessary hardware infrastructure will be provided by the hospital
* The hospital will designate a project team to work with the implementation team
* Current patient data will be migrated to the new system
* Hospital operations will continue during implementation with minimal disruption
* The hospital will provide necessary resources for testing
* The hospital has the necessary licenses for third-party software integration
* Staff will adapt to the new system with appropriate training
* Network infrastructure is adequate for the new system

6. Constraints

* The system must be fully implemented within 12 months
* The implementation must not disrupt critical patient care operations
* The system must comply with all relevant healthcare regulations (HIPAA, etc.)
* Budget constraints as approved by hospital board
* Limited IT staff available for implementation support
* Legacy systems must remain operational until complete data migration
* System must be compatible with existing hardware where possible
* Limited integration capabilities with certain specialized medical equipment
* Training must be conducted in phases to accommodate staff schedules

7. Risks

*Technological Risks*

* Integration complexities with existing medical equipment
* Data migration issues from legacy systems
* Security vulnerabilities that could compromise patient data
* System performance issues under high user load
* Network infrastructure inadequacies
  + Mitigation Strategies:
    - Conduct thorough system integration testing
    - Develop a comprehensive data migration plan with validation
    - Implement robust security measures and regular security audits
    - Perform load testing before go-live
    - Assess network infrastructure and upgrade as needed

*Skills Risks*

* Lack of experienced healthcare IT implementation specialists
* Inadequate training resources for hospital staff
* Resistance to adoption from medical staff
  + Mitigation Strategies:
    - Hire consultants with healthcare IT implementation experience
    - Develop comprehensive training materials and schedule sessions
    - Identify champions among staff to promote adoption

*Political Risks*

* Changes in hospital leadership during implementation
* Shifting healthcare regulations
* Competing priorities within the hospital
  + Mitigation Strategies:
    - Secure formal commitment from hospital board
    - Stay informed about regulatory changes
    - Establish clear project priorities

*Business Risks*

* Disruption to patient care during implementation
* Impact on revenue cycle during transition
* Loss of patient data during migration
  + Mitigation Strategies:
    - Implement in phases to minimize disruption
    - Develop a parallel processing plan during transition
    - Create robust backup and validation procedures

*Requirements Risks*

* Incomplete understanding of specialized oncology workflows
* Evolving requirements during implementation
* Conflicting requirements from different departments
  + Mitigation Strategies:
    - Conduct thorough requirements validation with oncology specialists
    - Establish change control procedures
    - Facilitate cross-departmental requirement review sessions

*Other Risks*

* Vendor management issues
* Staff turnover during implementation
* Budget overruns
  + Mitigation Strategies:
    - Establish clear vendor management protocols
    - Cross-train implementation team members
    - Include contingency in budget planning

8. Business Process Overview

*8.1. Legacy System (AS-IS)*

The current cancer hospital management processes involve a combination of paper-based systems and disconnected software applications:

* Patient Registration: Manual forms and basic electronic database
* Appointment Scheduling: Combination of paper calendars and basic scheduling software
* Medical Records: Primarily paper-based with partial electronic documentation
* Pharmacy Management: Standalone pharmacy system with manual prescription handling
* Laboratory Services: Paper requisitions with results manually entered into patient records
* Billing: Separate billing software with manual coding and claim submission
* Inventory: Manual tracking with spreadsheets



Key challenges in the current system include:

* Data silos between departments
* Limited accessibility to patient information
* Inefficient appointment scheduling
* Delayed access to test results
* Manual data entry causing errors
* Difficulty tracking patient treatment history
* Inefficient billing processes
* Limited reporting capabilities

*8.2. Proposed Recommendations (TO-BE)*

The proposed Cancer Hospital Management System will address the challenges in the legacy system through:

* Centralized Database: All patient information stored in a single, secure database
* Integrated Modules: Seamless flow of information between departments
* Electronic Workflows: Automated processes for appointment scheduling, prescription management, etc.
* Role-Based Access: Appropriate access to information based on user roles
* Real-Time Updates: Immediate availability of patient information and test results
* Electronic Documentation: Digital capture of all patient interactions
* Automated Billing: Streamlined coding and claim submission
* Inventory Tracking: Automated management of medical supplies
* Comprehensive Reporting: Analytics and reporting capabilities



Key improvements in the proposed system:

* Elimination of data silos
* Improved patient care through better information access
* Reduced administrative overhead
* Enhanced compliance with healthcare regulations
* Better resource utilization
* Improved patient experience
* Better decision support for clinicians
* Enhanced financial management

9. Business Requirements

*Functional Requirements*

|  |  |  |  |
| --- | --- | --- | --- |
| **Req ID** | **Req Name** | **Req Description** | **Priority** |
| FR001 | Login | User must be able to login to access the application | High |
| FR002 | Patient Registration | System shall allow staff to register new patients with personal and medical details | High |
| FR003 | Appointment Scheduling | System shall enable scheduling of patient appointments with doctors | High |
| FR004 | Medical Records | System shall maintain comprehensive medical records for each cancer patient | High |
| FR005 | Treatment Planning | System shall allow oncologists to create and update treatment plans | High |
| FR006 | Medication Management | System shall track prescribed medications for patients | High |
| FR007 | Lab Results | System shall integrate with laboratory systems to receive and display test results | Medium |
| FR008 | Imaging Integration | System shall store and display radiology and other imaging results | Medium |
| FR009 | Billing | System shall generate bills and process insurance claims | High |
| FR010 | Inventory Management | System shall track medical supplies and equipment | Medium |
| FR011 | Staff Management | System shall maintain records of hospital staff and their schedules | Medium |
| FR012 | Reporting | System shall generate various reports for administrative and clinical purposes | Medium |
| FR013 | Patient Portal | System shall provide patients with access to their information | Low |
| FR014 | Notifications | System shall send automated reminders for appointments | Medium |
| FR015 | Radiation Therapy Tracking | System shall track radiation therapy sessions and dosages | High |

*Non-Functional Requirements*

|  |  |  |  |
| --- | --- | --- | --- |
| **Req ID** | **Req Name** | **Req Description** | **Priority** |
| NF001 | Security | System shall comply with healthcare data protection regulations | High |
| NF002 | Performance | System shall support at least 100 concurrent users | High |
| NF003 | Availability | System shall be available 24/7 with 99.9% uptime | High |
| NF004 | Backup | System shall perform automatic daily backups | High |
| NF005 | Compatibility | System shall be compatible with major browsers and operating systems | Medium |
| NF006 | Usability | System shall have intuitive interface requiring minimal training | Medium |
| NF007 | Scalability | System shall be able to scale to accommodate growing patient numbers | Medium |
| NF008 | Audit Trail | System shall maintain logs of all user actions for auditing purposes | High |

10. Appendices

*10.1. List of Acronyms*

* BRD: Business Requirements Document
* CHMS: Cancer Hospital Management System
* EMR: Electronic Medical Records
* HIPAA: Health Insurance Portability and Accountability Act
* FR: Functional Requirement
* NF: Non-Functional Requirement
* RACI: Responsible, Accountable, Consulted, Informed
* ROI: Return on Investment
* SLA: Service Level Agreement
* UAT: User Acceptance Testing

*10.2. Glossary of Terms*

* Oncology: The study and treatment of tumours and cancer
* Chemotherapy: Treatment that uses drugs to kill cancer cells
* Radiation Therapy: Treatment that uses high doses of radiation to kill cancer cells
* Treatment Plan: A detailed plan that describes the treatment process for a cancer patient
* Medical Oncologist: A doctor who specializes in treating cancer with medicine
* Radiation Oncologist: A doctor who specializes in treating cancer with radiation
* Surgical Oncologist: A doctor who specializes in cancer surgery
* Palliative Care: Specialized medical care focused on providing relief from pain and other symptoms of a serious illness

*10.3. Related Documents*

* Functional Specifications Document
* Technical Architecture Document
* System Design Document
* Test Plan
* Training Plan
* Data Migration Plan