

# **Indiana Medical Center Healthcare Information System Implementation Plan**

**By Justin Abraham**

INFO-C451  
Jafrina Jabin  
Indiana University  
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## **Project Overview**

Indiana Medical Center is implementing a new Electronic Health Record (EHR) system to replace its outdated paper systems. The goal is to improve patient data accuracy, staff efficiency, and overall quality of care.

This report outlines how the system will be developed, tested, and implemented, ensuring a smooth transition and limiting interruptions to daily operations.

## **System Implementation in the SDLC**

The implementation phase comes after the design and development stages of the Systems Development Life Cycle (SDLC). This is where the new EHR system begins to be put into use at the medical center. This phase focuses on setting up the system, moving data, training users, and making sure everything works correctly before the full system goes live.

Main Objectives:

- Install and set up the EHR software on all devices and servers
- Move patient records from the old system or paper files into the new one
- Train staff members so they can use the system confidently
- Test the system to make sure it runs smoothly and securely

Important Tasks:

- Configure the live environment and confirm system access
- Use the Extract, Transform, and Load (ETL) process to move and clean data
- Run user testing to confirm the system meets staff requirements
- Watch system performance closely after launch and fix any early issues

The phase is finished when:

- The EHR system is live and working properly
- All main features are tested and approved
- Data migration is accurate and complete.
- Staff are trained and use the new system with little disruption

## **Development Methodology**

This EHR project uses the Agile development methodology. Agile focuses on building and improving the system in short cycles called sprints. Each sprint includes planning, development, testing, and review, allowing the team to make quick changes based on user feedback. Agile works well for healthcare projects because it gives the team flexibility to adjust to new requirements, regulations, or feedback from doctors and staff. It also ensures that working parts of the system, such as patient records or scheduling, are delivered and tested early instead of finding issues at the end of the project life cycle.

Main advantages of Agile development:

- Allows quick updates based on user feedback
- Encourages close teamwork between IT staff and medical staff
- Reduces risk by testing and improving the system in small steps

## **Planning Objectives and Strategies**

The planning phase defines what the project needs to achieve and how it will be delivered. Extensive planning helps the implementation team stay organized, meet deadlines, and avoid major problems when deployment happens.

Planning Objectives:

- Identify project goals, scope, and success criteria
- Develop a clear schedule and assign responsibilities
- Ensure all technical, financial, and staffing needs are met before implementation

Success Strategies:

- Hold regular meetings with hospital staff and stakeholders to gather feedback
- Set realistic timelines for each phase of development and testing
- Provide early training to prepare users for the new system
- Continuously track progress and adjust plans as needed

## Risk Assessment and Mitigation

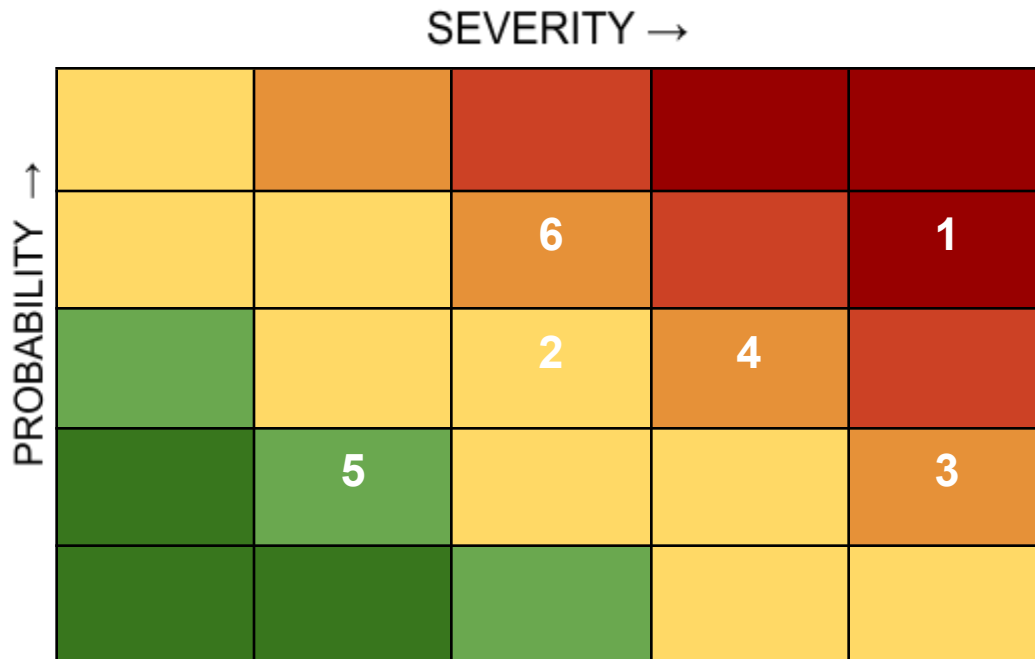
Every system implementation comes with potential risks that can affect cost, schedule, or system performance. Identifying these risks early allows the team to prepare mitigation strategies. The EHR project is vulnerable to both technical and human risks such as data errors, software issues, or staff resistance to change.

Major Risks and Mitigation Strategies:

Risk No.	Risk	Impact	Mitigation Strategy
1	Data migration errors	High	Perform test runs, validate data, and back up all records before importing
2	User resistance or lack of training	Medium	Offer hands on training sessions and provide ongoing user support
3	Security or privacy breaches	High	Use encryption, strong passwords, and access controls for sensitive data
4	System downtime during rollout	Medium	Schedule deployment during low activity hours and maintain a rollback plan
5	Vendor or software delays	Medium	Prepare backup options if delay is critical to timeline
6	Data integration errors	Medium	Test system connections early and fix compatibility issues before launch

Risk Matrix:

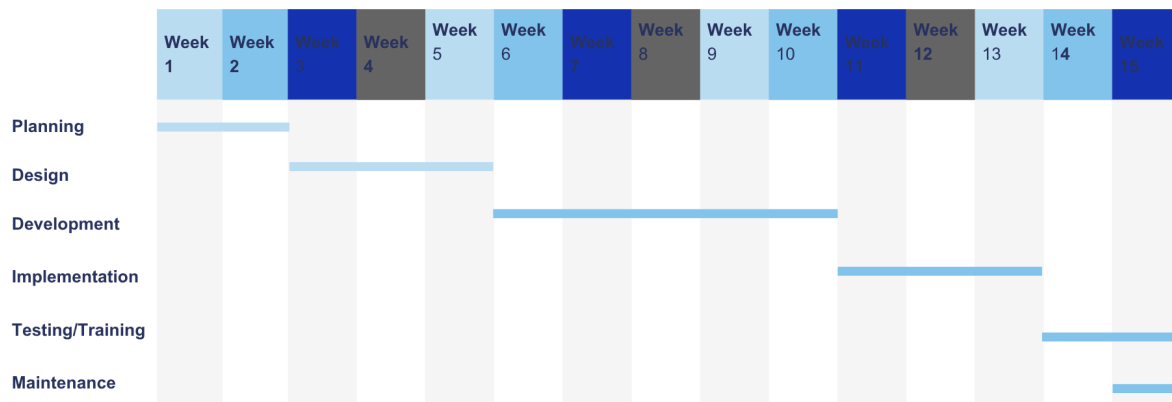
Risk Numbers from the above table are used to populate the risk matrix.



## Gantt Chart / Project Timeline

A project timeline will help the team keep track of progress and phase goals. The implementation of the EHR system will take place over several phases. Each phase has its own goals and deliverables to ensure the project stays organized and is delivered on time.

Gantt Chart:



### Project Timeline:

Phase	Duration	Milestone
Planning	Weeks 1–2	Project scope and requirements approved
Design	Weeks 3–5	System architecture and interfaces completed
Development	Weeks 6–10	Core EHR features built and reviewed
Implementation	Weeks 11–13	Pilot version launched in select departments
Testing & Training	Weeks 14–15	User testing completed
Maintenance	Ongoing	Regular updates and performance monitoring

### Installation Approach

The Phased Installation method will be used for this project. This approach introduces the new EHR system in stages, starting with one department and expanding to others as integration is successful. It allows the team to test the system in a real setting, fix issues early, and reduce disruption to hospital operations. Using a phased rollout is safer than a direct cutover because it limits risk by moving the system in parts and allows users time to adapt. Feedback from the first phase can be used to improve later installations.

Phased Installation reasons:

- Reduces the chance of major system failures or downtime
- Allows real user feedback before full deployment
- Provides time to train staff in smaller groups
- Makes it easier to identify and correct problems early

## Installation Schedule

The installation schedule outlines the main steps needed to fully deploy the EHR system across Indiana Medical Center. Each step includes setup, data migration, user training, and verification to make sure everything runs correctly before moving to the next phase.

Installation timeline:

Step	Description	Duration
Server Setup	Install and configure servers, databases, and network connections	3 days
Department Pilot	Launch the EHR system in the outpatient department for testing	1 week
Staff Training	Provide training for doctors, nurses, and administrative staff	1 week
Full Rollout	Expand the system to all departments after pilot approval/success	2 weeks
Post-Launch Review	Monitor performance, gather feedback, and fix issues	1 week

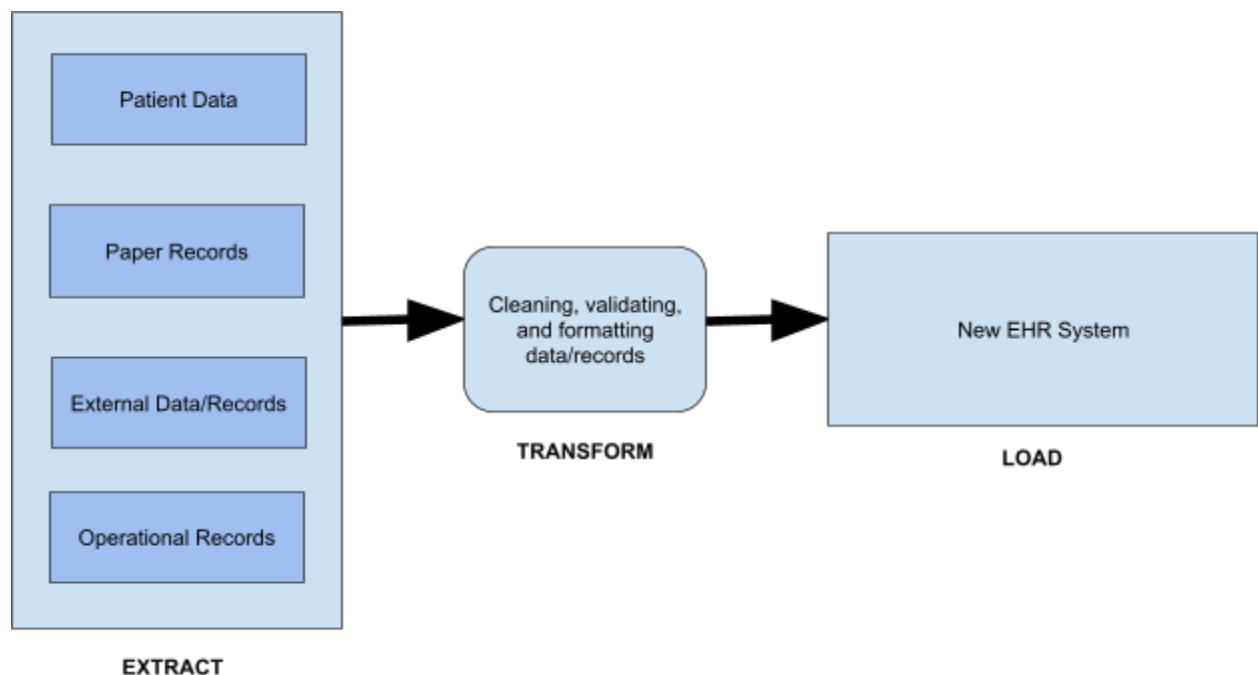
## Data Migration Plan (ETL Process)

Data migration is one of the most important parts of the EHR implementation. It ensures that all patient and hospital data from old systems or paper records is accurately moved into the new database. The process follows the ETL method, which stands for Extract, Transform, and Load.

ETL Process:

- **Extract:** Data is collected from multiple sources such as legacy software, spreadsheets, scanned records, etc.
- **Transform:** The data is cleaned, formatted, and checked for errors or duplicates to match the structure of the new EHR system
- **Load:** Once validated, the data is imported into the new system in batches followed by quality checks to confirm accuracy

Diagram:



Backups are created before migration to prevent data loss, and small test runs are performed before the full load to make sure the process works correctly. After the data is imported, sample records are reviewed by staff to confirm that information displays properly in the new system.



## Test Plan

Testing ensures that the new EHR system works as intended before it is used by hospital staff. The goal is to identify and correct any problems early to avoid system errors after launch. Testing will cover all major functions such as patient records, scheduling, billing, and security. The testing process will use both manual and automated methods to confirm accuracy, performance, and ease of use. Each round of testing will be followed by documentation and review to track progress and verify that all issues are fixed.

### Testing Scope and Objectives:

- Verify that all system features perform correctly
- Ensure data accuracy and system security
- Confirm that users can complete daily tasks without issues
- Identify and fix issues before full rollout

### Testing Tools and Roles:

- Tools: Selenium, Postman, and Cypress for automation; manual testing for general usability
- Roles: QA testers will execute tests, developers will correct errors, and end users will complete user testing

Testing will be completed before system rollout, and all test results will be recorded for future maintenance and performance monitoring.

## Detailed Test Cases

<b>Test Case ID</b>	TC-1
<b>Test Case Name</b>	User Login
<b>Preconditions</b>	A valid EHR account exists with an assigned username and password
<b>Input</b>	Username and password entered on the login screen
<b>Expected Output</b>	The system verifies the credentials and opens the user's EHR dashboard

<b>Test Case ID</b>	TC-2
<b>Test Case Name</b>	Patient Record Creation
<b>Preconditions</b>	The user is logged into the EHR system with permission to add patient records
<b>Input</b>	Patient name, date of birth, contact information, and medical history entered into the form
<b>Expected Output</b>	The system saves the new patient record and displays a confirmation message with a unique patient ID

## Debugging and Error Handling

Debugging and error handling are essential to ensure the EHR system runs smoothly after deployment. During development and testing if any errors found they are documented, fixed, and tested to confirm that the issue no longer occurs. The development team will use system logs and testing tools to identify problems. Each error will be reviewed to determine its cause and priority level before being fixed. Once fixed, additional testing will be done to make sure no new issues are introduced.

Error Handling Procedures:

- All system errors generate automatic log entries with timestamps and error codes
- Users receive clear and non-technical error messages
- Critical errors such as data or connection failures alert the technical support team immediately
- Repeated or severe issues are reviewed for long-term solutions

## **Automated Testing Tools**

Automated testing tools help speed up the testing process and improve accuracy by running tests repeatedly without manual effort. For this EHR project automated testing is used to verify that core functions such as login, data entry, and reporting continue to work correctly after updates. Tools like Selenium, Cypress, and Postman are useful for this type of system. Selenium and Cypress can test the EHR's web interface by automatically clicking through screens, filling out forms, and checking results. Postman is used to test the system's APIs, making sure data from integrated systems is accurate and consistent.

Benefits of Automated Testing:

- Increases testing speed and accuracy
- Detects bugs earlier in the development process
- Saves time compared to repeating manual tests
- Improves system reliability with consistent testing

## **Data Quality Issues and Cleansing Strategies**

Maintaining accurate and consistent data is crucial for the EHR implementation to be successful. Poor data migration practices can lead to patient safety risks, billing errors, and reporting problems. Before and after migration, data must be carefully reviewed and cleaned to ensure reliability.

Common Data Quality Issues:

- Duplicate Records: Multiple entries for the same patient
- Incomplete Data: Missing information such as health or contact details
- Inconsistent Formatting: Different date or name formats across systems
- Outdated Information: Old patient addresses or inaccurate information

Cleansing Strategies:

- Run automated scripts to find and merge duplicate records
- Use validation rules that require key fields
- Standardize data formats during the transformation phase of the ETL process
- Review samples of migrated data to confirm accuracy and completeness

## **Data Conversion Method**

The automated data conversion method will be used for the EHR project. This approach transfers large amounts of patient and hospital data from the old system into the new EHR automatically using scripts and migration tools. Automated conversion reduces human error and speeds up the process compared to manual entry. Before conversion begins all data is backed up to prevent loss. The system then runs test migrations to confirm that data transfers correctly and matches the required format. Any records that fail validation are flagged for review and correction before the final import.

Steps in the Conversion Process:

1. Back up all existing data from the legacy system
2. Run automated scripts to convert and reformat data
3. Validate the data structure and fields
4. Import data into the live EHR database
5. Review reports to confirm accuracy

## **Testing and Validation for Data Accuracy**

After data migration, testing and validation are performed to make sure all information was transferred correctly and is displayed properly in the new EHR system. The goal is to confirm that no records were lost, duplicated, or changed during the process. Validation compares data from the old system with what appears in the new database. Extensive checks are performed on totals and individual records to ensure consistency. For example, the number of patient records or appointments should match exactly between systems.

Data Validation Steps:

1. Review record counts before and after migration to confirm totals match
2. Randomly select sample patient records and compare key fields
3. Verify that relationships between data remain intact
4. Run automated scripts to detect missing or duplicate entries
5. Have end users confirm that data displays correctly within the EHR interface

## **Integration of Components**

All components of the EHR implementation work together to form a smooth and successful system launch. Each stage plays a specific role in delivering a reliable and user friendly system. The planning and development phases establish the foundation by defining goals, designing workflows, and building the core system. The testing and training stages ensure the software functions correctly and that staff are prepared to use it. Data migration and validation guarantee that accurate patient information is available from day one.

### **Key Integrated Elements:**

1. **Project Management:** Coordinates all phases and keeps the project on schedule
2. **System Design and Development:** Builds the core features and ensures they meet user needs
3. **Testing and Debugging:** Finds and fixes problems before deployment
4. **Data Migration and Quality Control:** Transfers accurate information into the live environment
5. **Training and Support:** Ensures staff are ready and confident using the new system

## **Key Success Factors and Post-Implementation Review Criteria**

The success of the EHR implementation depends on how well the system meets technical, organizational, and user based goals. Success is measured through both quantitative results such as data accuracy and uptime, and qualitative feedback such as user satisfaction and ease of use.

### **Key Success Factors:**

1. User Adoption: Majority of staff is successfully trained and actively using the EHR
2. Data Accuracy: Close to 100% data accuracy confirmed after migration
3. System Performance: Stable uptime and quick response times
4. Security Compliance: Meets all HIPAA and internal privacy standards
5. Workflow Improvement: Noticeable time savings and fewer documentation errors

### **Review Criteria:**

- Conduct a post-implementation review two to four weeks after launch.
- Gather feedback from users through surveys and support tickets.
- Evaluate whether project goals and timelines were met.
- Document lessons learned and recommended system enhancements.

## **Lessons Learned and Continuous Improvement**

For this EHR project, early communication with users and phased installation were key strengths. Involving doctors, nurses, and administrators throughout development helped identify issues before launch and increased user confidence. Training sessions also proved essential for smooth adoption.

However, challenges such as data formatting differences and user resistance highlighted the need for more time in data preparation and hands-on training. These lessons guide future updates and support planning for new features or system integrations.

Continuous improvement focuses on finding ways to make the system better over time. User feedback is collected regularly to guide updates and new features based on actual use. Refresher training helps maintain user confidence, and quarterly reviews of performance and data quality ensure the system continues to run effectively.

By applying these lessons, Indiana Medical Center can continue refining the EHR system by keeping it secure, efficient, and aligned with changing healthcare needs.