## **Functional and Performance Testing**

The Functional and Performance Testing Phase ensures that every component implemented—such as clinical data entry, field validation, machine learning workflows, automation, dashboards, and reporting—works exactly as intended. This phase guarantees: Clinical accuracy, System stability, Predictive correctness, User-readiness, for the Liver Cirrhosis Prediction System.

The system is thoroughly validated for data accuracy, prediction behavior, and clinical output consistency across all configured modules and relationships.

## **Performance Testing Summary Table**

S. No	Parameter	Value/Observation	Screenshot
3. 140	Farameter	value/Obsel valion	Suggestion
1	Model Summary	End-to-end liver cirrhosis prediction system using clinical datasets, ML models, and dashboards. Note: Model accepts only correctly formatted clinical inputs. Mismatched or incomplete data triggers validation alerts.	
2	Field Validations	Tested clinical rules such as: - Age ≥ 18 - Required lab results cannot be empty - Numeric limits for test values (e.g., ALT, AST levels) System blocks invalid or incomplete entries.	df.shape  (950, 42)  df.isnull().any()  df.isnull().sum()  S.NO  Age  Gender  Place(location where the patient lives)  Unvarion of alcohol consumption(years)  Quantity of alcohol consumption (quarters/day)  Type of alcohol consumption  Hepatitis 8 infection  Hepatitis 6 infection  Obiabetes Result  Slood pressure (mmhg)  Obesity  Samily history of cirrhosis/ hereditary  Samily history of cirrhosis/ hereditary  Holl  1359  101  1359  101  1359  101  1368  Hemenglobin (g/d1)  PCV (%)
3	Automation Accuracy (Flow + Trigger)	<ul> <li>Data Pipeline: Auto-extracts features and validates input ranges.</li> <li>ML Model: Automatically predicts risk level on new patient data.</li> <li>All workflows executed successfully in test runs.</li> </ul>	The control of the problem is the problem in the problem in the problem in the problem is the problem in the problem in the problem in the problem is the problem in the pr

4	Reports Testing	<ul> <li>Risk Summary Report correctly groups patients by risk levels.</li> <li>Calculated clinical metrics (BMI, age, prediction scores) displayed accurately.</li> <li>Export and filtering features verified.</li> </ul>	Naive Bayes  The other-noise Super dentions  Random Forest  From Aller-noise Input month/restricible  (**,**rois**  Random Forest  From Aller-noise Input month/restricible  (**,**rois**  Logistic Regression  From Aller-noise Super dentions  (**,**rois**  Logistic Regression  From Aller-noise Super dentions  (**,**rois**  Logistic Regression  From Aller-noise Super dentions  (**,**rois**  **,**rois**  **,**r
5	Dashboard Verification	<ul> <li>Dashboards reflect live patient risk data and population trends.</li> <li>Real-time refresh and filter logic validated</li> </ul>	and Experiment (Experiment (Experiment) and Experiment (Ex
6	Data Accuracy (Manual + Automated )	<ul> <li>Manual data entry tested with various clinical scenarios.</li> <li>Automated data processing verified across multiple test cases.</li> <li>Outputs consistently matched expected results.</li> </ul>	Model Testing    States Realts = [18", 10"]     States Realts   Sta

## Summary

All components of the **Liver Cirrhosis Prediction System** were rigorously tested for:

- Field validation accuracy
- Machine learning prediction correctness
- Automation flow reliability
- Dashboard and reporting precision
- Clinical data integrity across relationships

The system successfully meets **functional**, **performance**, **and user-readiness standards**, ensuring dependable and actionable liver disease predictions.