Timeline

Beginning

Project Conceptualization

- Objective Definition.
- Target Users: Patients, physicians, caregivers, hospital administrators.
- Problem Analysis.

Planning

Data Acquisition

- Sources.
- Data Streaming.
- Storage Strategy.

Investigation

Data Preprocessing & Feature Engineering

- Data Cleaning.
- Normalization & Scaling.
- Feature Engineering.

Innovation

Digital Twin Model Development

- Model Type.
- Patient–Specific Modeling.
- Model Architecture.
- Optimizer & Loss.

Creativity

Predictive Analytics & Risk Scoring

- Prediction Targets.
- Alert Thresholds.
- Multivariate Risk Analysis.

Recognition

Explainable AI Integration

- SHAP Implementation.
- Clinical Insights.
- Visualization.

Education

Visualization & Dashboard

- Features.
- Tools.

Developments

System Integration & API Layer

- REST APIs.
- Data Exchange.
- Scalability.
- Security.

News

Model Evaluation & Validation

- Metrics.
- Validation.
- Explainability Validation.

Advances

Deployment, Monitoring & Maintenance

- Deployment.
- Real-time Monitoring.
- Retraining Pipeline.
- Feedback Loop.

Vanguard

Key Advantages

- Individualized digital twin.
- Real-time monitoring.
- Explainable AI.
- Modular and scalable architecture.
- End-to-end system.