**1. Working with External Datasets**

* **Purpose:** Demonstrate that the model is **generalizable** and not tied to a specific dataset.
* **How it works in the prototype:**
  + Allow users to **upload their own CSV or connect to a database**.
  + Preprocess the new dataset to match the **format expected by the model** (features, time windows, risk labels if available).
  + Generate **predicted 30/60/90-day risk scores** and map members into **risk tiers**.
  + Dashboard can visualize risk distribution, member trajectories, and conceptual interventions for the new data.
* **Limitations:**
  + Predictions may be **less accurate** if the external data has patterns or distributions very different from what the model was pretrained on.
  + Prototype will **demonstrate functionality**, but accuracy may vary.

**2. Provision for Retraining**

* **Recommendation:** Yes, include a **retraining option** in the prototype to allow adaptation to new data.
* **How it can work:**
  1. Upload new dataset.
  2. Preprocess it into 30/60/90-day windows.
  3. Retrain or fine-tune the model (LSTM + XGBoost) using the new data.
  4. Generate updated **risk scores** and **risk tiers** for visualization.
* **Benefits:**
  1. Shows **prototype flexibility and generalizability**.
  2. Lets stakeholders test **“what-if” scenarios** with their own datasets.
  3. Provides a **proof-of-concept for production scaling**, where the model can continuously learn from new member data.
* **Implementation Tip:**
  1. For the prototype, **limit retraining to smaller datasets** or **subset of data** to keep training time short.
  2. Use a **“retrain button”** in the UI or a simple script that updates the model weights.

**3. Recommended Prototype Workflow with External Data**

1. **Upload Dataset:** User provides CSV or database connection.
2. **Preprocessing:** Standardize features and create temporal windows (30/60/90 days).
3. **Optional Retraining:** Fine-tune model on new data if needed.
4. **Prediction:** Generate risk scores for each member.
5. **Intervention Mapping:** Map to conceptual interventions.
6. **Visualization:** Dashboard shows:
   * Population risk distribution
   * Member trajectories
   * Suggested interventions
   * ROI simulation