**Expressed Breast Milk (EBM) Management System – Requirements Summary**

**1. General System Overview**

The system is designed to manage the delivery, verification, and usage of expressed breast milk (EBM) in hospitals. It ensures safe handling and identification through QR codes, biometric data, and multi-user role management.

**2. QR Code Specifications**

* **Purpose**: The QR code links milk bottles to the correct mother and baby.
* **Placement**:
  + One on the **milk bottle**.
  + One on the **baby’s hand band**.
* **QR Code Contents**:
  + Baby’s **name**, **date of birth**, **MRN** (Medical Record Number).
  + **Bottle number**: Must be unique (a mix of digits and letters).
* **Functionality**: Scannable for verification and tracking across the system.

**3. EBM Delivery Section**

* **Data Captured**:
  + **Date of expression**: When the milk was pumped.
  + **Date of delivery**: When the milk arrived at the hospital.
  + **Bottle details**: Bottle number, unique identifier (QR), volume.
* **Responsibility**: Nurses enter and manage this data.
* **System Actions**:
  + Save and link data to the corresponding baby using their name and MRN.
  + Save file format: Bottle\_Stored\_Number\_UniqueNumber\_BabyName\_MRN.

**4. EBM Verification Process**

* **Primary Verification (Nurse 1)**:
  + Scan the **milk bottle’s QR code**.
  + Verify using one or more of the following:
    - **Baby’s face photo**
    - **Footprint scan/photo**
    - **Retina scan**
    - **QR code on baby’s wristband**
* **Secondary Verification (Nurse 2)**:
  + Receives verification request.
  + Must approve to complete the process.
  + If **rejected**, the process must start over.
* **If the baby doesn't match**:
  + Match the bottle QR with **mother’s ID** or **Fingerprint**.
  + If a match is found, **reprint the QR code** and reattempt.
  + If no match at all, system shows: **"This milk does not belong to this baby – Do not give"**.

**5. EBM Usage Section**

* **Tracking Details**:
  + Bottle number & unique code.
  + Volume of milk used.
  + Amount discarded (auto-calculated).
* **System Action**:
  + Update cumulative totals in the database.
  + Save file format: Used\_Number\_UniqueNumber\_BabyName\_MRN.

**6. Milk Calculation Section**

* **Totals Displayed**:
  + Total milk stored.
  + Total milk used.
  + Total milk discarded.

**7. Biometric Baby Data Collection**

* **Face Photo**:
  + Captured via camera or uploaded.
  + Saved with name and MRN.
* **Footprint**:
  + Captured via scanner or camera.
  + Saved and linked.
* **Retina Print**:
  + Captured or scanned.
  + Used in verification process.
* **Purpose**: All biometric data ensures safety in milk delivery.

**8. Mother Information**

* Name in Arabic & English.
* Mother’s MRN, Age (12–70 years), ID photo, Delivery date.
* Fingerprint and ID scan.
* Info used as backup verification if baby matching fails.

**9. Help Section**

* **Purpose**: Educates users on actions (e.g., taking photos, scanning).
* **Legal Info**: Shows responsibilities and consequences of mistakes.

**User Roles & Responsibilities**

**1. Admin**

* Approve/reject **nurses** and **parents**.
* Monitor **verification activity**:
  + View successful and failed attempts.
  + If a nurse fails verification 3 times → flagged for retraining.
* View **login history** and **profiles** of all users.
* Search or delete **baby records**.
* Message all users.

**2. Nurse**

* Create/search/edit **baby records**.
* View **parent profiles**.
* Initiate and verify the **EBM delivery and verification process**.
* Message **admin** and **parents**.
* Cannot delete records.
* Each nurse has:
  + **Username**, **full name**, and a **unique ID**.

**3. Parent**

* View:
  + Baby’s profile and biometric data.
  + Milk inventory (total bottles and milk remaining).
* Can send/receive messages within the system with nurses.