

# Mom-Village

## 1. Project Proposal

### 1. Project Title:

**Pregnancy and Postpartum Woman System**

### 2. Project Description: Comprehensive Maternal and Child Health Support Platform

The proposed project aims to design a software platform that supports women throughout their pregnancy and postpartum journey, focusing on health, well-being, and informed decision-making regarding both mother and child.

The system will act as a centralized, secure digital health hub that connects mothers with reliable medical information, personalized guidance, and professional consultation services, thereby bridging the gap between general maternal health advice and individualized care.

The platform will enable mothers to create and manage detailed Mother and Baby Profiles, track critical data points such as pregnancy progress, postpartum recovery, and the baby's growth and vaccination schedule (specifically adhering to the Egyptian National Vaccination Schedule). It will provide automated, timely reminders for medications, vitamins, and appointments, ensuring proactive health management.

In addition, the system will serve as a specialized knowledge base, recommending safe nutrition plans, exercises, and medications, while providing necessary warnings on forbidden foods, cosmetics, and drugs. A core feature is the Doctor Consultation Service, which allows mothers to book online appointments, engage in secure chat, and receive professional advice from certified physicians. The platform will also provide crucial mental health support through depression awareness and self-assessment tools.

**System Features:** The system will include Student and Doctor profiles, course and specialization management, certificate generation, a mentorship module, an internship/job portal, and a recommendation engine for personalized career pathways.

**System Features:** The system will include Mother and Baby Profiles, Doctor Profile Management, an Egyptian Vaccination Tracker, a Growth Chart Module, Personalized Dashboards and Reminders, a Medication & Safety Warning database, and a Secure Doctor Consultation Service.

**Boundaries and Constraints:** The system will primarily serve pregnant and postpartum mothers and licensed partner doctors. It will rely on stable internet connectivity for real-time consultation and automated data synchronization. Key constraints include ensuring data privacy and security (especially medical history), adherence to official national health protocols (e.g., the Egyptian vaccination schedule), and scalability to handle a large volume of concurrent user interactions and data logging.

### 3. Team Members

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23102384	Mennatullah Abdelaziz	Mennatallah.abdelaziz.2024@aiu.ed.eg	Project Manager
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#### 4. Initial Identified Customer Requirements.

##### R1- User Authentication and Access Control

**R1.1** The system shall allow users (mothers and doctors) to register (Sign Up) and log in (Login).

**R1.1.1** Users can select their account type (Mother \_Female Doctor, Male Doctors).

**R1.1.2** The system shall make this securely using encrypted passwords and Gmail.

##### R2- Mother Profile Management

**R2.1** The mother user can enter and update her personal information (name, age, current pregnancy week, last menstrual period date, previous delivery type).

**R2.2** Add her medical history **for following her health.**

##### R3- Baby Profile Management

**R3.1** The mother can create and manage a profile for her baby.

**R3.1.1** The mother shall add information about her baby like name, gender, date of birth, birth weight, and length. **Supports multiple children.**

##### R4- Doctor Profile Management

**R4.1** Doctors can create and update their profiles with details such as specialization, experience, and available working hours for consultation.

##### R5- Pregnancy Month Information

**R5.1** The system shall be able to follows up the pregnancy state.

**R5.1.1** The for each of the nine pregnancy months would show: Common symptoms, physical and emotional changes, and required medical tests.

##### R6- Dietary guidance.

**R6.1** The system shall inform mothers about forbidden items with the need to guide on recommended nutrition.

**R6.1.1** The system will dynamically display a **clear, filterable list** of foods and drinks that are unsafe or prohibited for the user's current stage of pregnancy. **Each item will be accompanied by a brief explanation** of why it is forbidden (e.g., "High Mercury Content," "Risk of Listeria").

**R6.1.2** The system will display **daily and weekly nutrition advice**, including key nutrients to focus on

(e.g., iron, folate, Omega-3s) for the current stage. This will be presented as a recommended, balanced **diet plan** or meal suggestion guide.

**R6.1.3** The content will be organized into two main sections within a dedicated "Nutrition" feature: "**What to Avoid**" (the forbidden list) and "**What to Eat**" (the recommended guidance).

#### **R7- Cosmetic Product Warnings**

**R7.1** The system shall inform what is the cosmetics and skin products that she can't use.

**R7.1.1** Lists unsafe cosmetic and skincare products during pregnancy (e.g., hair dyes, whitening creams, perfumes with alcohol) and why she can't use them.

**R7.1.2** The system shall recommend safe products or alternatives.

#### **R8- Medication Follow-up**

**R8.1** The system shall inform mothers about forbidden and allowed medications and recommend alternatives.

**R8.1.1** The system shall display a list of medications that are **safe, questionable, or unsafe** for the mother's current month of pregnancy, based on established medical guidelines.

**R8.1.2** The system shall recommend safe medicines or natural alternatives for each pregnancy month.

**R8.1.3** The system shall allow searching by drug name.

#### **R9- Doctor Consultation Service**

**R9.1** Allows mothers to book an appointment online with a doctor or to ask questions to doctors.

**R9.1.1** The system shall allow mothers to choose the doctor's gender.

**R9.1.2** The system shall provide a channel where mother and doctor can have conversations.

#### **R10- Depression Awareness**

**R10.1** The system shall allow user to have a depression Self-Assessment test.

**R10.1.1** The system will provide educational information about prenatal and postnatal depression, including symptoms, prevention tips, and psychological support methods.

#### **R11- Exercise Recommendations**

**R11.1** The System shall suggest safe exercises for each pregnancy stage (e.g., prenatal yoga, walking, breathing exercises), facilitate childbirth and restore the body's nature.

**R11.1.1** The System shall suggest safe exercises to facilitate childbirth.

**R11.1.2** The System shall suggest safe exercises to restore the body to its natural state after pregnancy and hide stretch marks.

#### **R12- Labor Type Comparison (Natural vs. Cesarean)**

**R12.1** The system shall help to raise awareness about labor Types (advantages and disadvantages of each one of them).

**R12.1.1** The System shall display a detailed comparison between natural and cesarean delivery, including the process, advantages/disadvantages, recovery time, possible complications, and pain levels.

#### **R13- Emergency Contact Feature**

**R13.1** Allows mothers to quickly contact their doctor or hospital during emergencies.

**R13.1.1** The system via one-click calling or messaging can call emergency.

**R13.1.2** The System shall insure doctor availability by sending alarm to hospitals and doctors assistants.

#### **R14- Data Privacy and Security**

**R14.1** All user data shall be securely encrypted and not shared.

##### **R14.1.1**

#### **R15-Feedback and Rating System**

**R15.1** Users can rate doctors, consultations, and the overall app experience, and submit improvement suggestions.

#### **R16- Performance and Scalability**

**R16.1** The system shall maintain fast response times and handle a large number of concurrent users efficiently.

#### **R17- Personalized Dashboard**

**R17.1** System shall display an interactive dashboard showing pregnancy progress, current week, expected symptoms, and reminders.

#### **R18- Chat & Message System**

**R18.1** System shall allow mothers to ask doctors.

**R18.1.1** System shall secure chat features between mothers and doctors during consultations or continuous follow-up.

#### **R19-Baby vaccination Management**

**R19.1** The system shall track the baby's vaccination schedule, sends reminders before each dose.

**R19.2** The system shall allow mothers to record completed vaccinations.

#### **R20- Breastfeeding Management**

**R20.1** The mother can track and manage breastfeeding sessions.

**R20.1.1** The system shall track duration, frequency, and side used (left/right).

**R20.1.2** The system can also provide reminders and helpful breastfeeding tips.

#### **R21- Family Planning Management**

**R21.1** The system allows the mother to learn about and manage family planning methods.

**R21.1.1** The system will provide information on different contraceptive options, their effectiveness, possible side effects, and reminders for appointments.

#### **R22-Mother Vaccination Follow-up**

**R22.1** The system allows the mother to record, track, and receive reminders about her prescribed medications and vaccination schedule.

**R22.1.1** The system will also provide dosage instructions and alerts for upcoming or missed doses.

#### **R24-Search Functionality**

**R24.1** The system shall allow users to search for: Doctors, Medications, Exercises, Foods or cosmetics.

#### **R25-AI Chatbot for Instant Support**

**R25.1** The system shall provide an AI-powered chatbot for instant, user support and information retrieval.

**R25.1.1** The chatbot must be trained on all app content, including foods, cosmetics, medications, symptoms, and exercises.

#### **R26-Tandem Nursing and Pregnancy Breastfeeding Support**

**R26.1** The system shall provide specialized guidance and tools for managing Tandem Nursing and breastfeeding during pregnancy.

**R26.1.1** The system must display detailed, evidence-based guidelines on the safety of breastfeeding while pregnant, clearly outlining warning signs (e.g., uterine contractions, bleeding) that require immediate medical consultation.

**R26.1.2** The system shall provide customized nutritional advice for mothers who are pregnant and breastfeeding, focusing on increased caloric and nutrient requirements.

**R26.1.3** The system must include information on the **changes to breast milk** during pregnancy (e.g., shift back to colostrum) and tips for managing potential aversion or the older child's refusal due to taste changes.

#### **R27-Chronic and Gestational Health Management**

**R27.1** The system shall provide dedicated tools for managing and monitoring chronic and gestational health conditions (e.g., Gestational Diabetes and hypertension).

**R27.1.1** The system must allow the mother to regularly log **blood sugar readings** (pre- and post-meals) and **blood pressure levels**.

**R27.1.2** The system shall analyze the logged data ( ) and issue **immediate alerts** if readings exceed recommended safe thresholds, instructing the mother to contact her doctor.

#### **R28-Alerts and notification to ensure successful tracking**

**R28.1** The system shall implement a comprehensive, personalized notification system to prompt necessary user actions and ensure successful health tracking.

**R28.1.1** The system shall send **proactive, context-aware reminders** for mothers.

#### **R29-Payment and subscription methods**

**R29.1** The system shall implement secure, reliable, and user-friendly payment and subscription mechanisms to facilitate financial transactions.

**R29.1.1** The system must integrate with at least two major, certified payment gateways (e.g., Stripe, PayPal, or local providers) to process transactions securely.

## 5. Initial Identified Subsystems

Subsystem Name	Subsystem Function	Subsystem Interface
<b>1. User Authentication &amp; Access Control</b>	<b>1.1 registerUser:</b> Allows mothers and doctors to sign up with encrypted credentials. <b>1.2 loginUser:</b> Authenticates users securely using username and password. <b>1.3 logoutUser:</b> Ends active session and clears tokens. <b>1.4 resetPassword:</b> Enables users to reset forgotten passwords securely. <b>1.5 R14.1 ensureDataSecurity:</b> Implements secure data encryption for all user information.	<pre>interface AuthSystem { void registerUser(UserData data); boolean loginUser(String email, String password); void logoutUser(String userId); void resetPassword(String email); }</pre>
<b>2. Mother Profile Management</b>	<b>2.1 createMotherProfile:</b> Allows mothers to input personal and pregnancy-related information. <b>2.2 updateMotherProfile:</b> Enables editing profile details and medical history. <b>2.3 deleteMotherProfile:</b> Deletes the profile and related data. <b>2.4 viewMotherProfile:</b> Displays the complete mother profile.	<pre>interface IMotherProfile { void createMotherProfile(); void updateMotherProfile(ProfileData data); void deleteMotherProfile(); Mother viewMotherProfile(String motherId); }</pre>
<b>3. Baby Profile Management</b>	<b>3.1 createBabyProfile:</b> Adds a new baby profile with essential information. <b>3.2 updateBabyProfile:</b> Updates baby details and vaccination info. <b>3.3 deleteBabyProfile:</b> Removes baby profile.	<pre>interface IBabyProfile { void createBabyProfile(); void updateBabyProfile(BabyData data); void deleteBabyProfile(); Baby viewBabyProfile(String babyId); }</pre>

Subsystem Name	Subsystem Function	Subsystem Interface
	<b>3.4 viewBabyProfile:</b> Displays baby's details and growth data.	
<b>4. Doctor Profile Management</b>	<b>4.1 createDoctorProfile:</b> Registers new doctors with specialization details. <b>4.2 updateDoctorProfile:</b> Allows updates to schedules and info. <b>4.3 deleteDoctorProfile:</b> Deletes doctor profile. <b>4.4 viewDoctorProfile:</b> Shows doctor details for patient selection.	<pre>interface IDoctorProfile { void createDoctorProfile(); void updateDoctorProfile(DoctorData data); void deleteDoctorProfile(); Doctor viewDoctorProfile(String doctorId); }</pre>
<b>5. Nutrition &amp; Diet Management</b>	<b>5.1 getNutritionPlan:</b> Provides personalized meal plans by pregnancy stage. <b>5.2 viewDailyTips:</b> Displays healthy diet tips and vitamin suggestions. <b>5.3 trackWaterIntake:</b> Allows daily hydration tracking. <b>5.4 ForbiddenFoods:</b> Lists foods/drinks to avoid each month. <b>5.6 GetDietaryGuidance:</b> Recommend nutrition advice.	<pre>interface INutritionSystem { NutritionPlan getNutritionPlan(int month); List&lt;String&gt; viewDailyTips(); } interface IWaterIntake { void trackWaterIntake(String motherId, double amount); } Interface IDietaryGuidance {displayForbiddenFoods(int month); }interface IGetDietaryGuidance { List&lt;Product&gt; getDietaryGuidance() }</pre>
<b>6. Cosmetics Awareness Module</b>	<b>6.1 getCosmeticWarnings:</b> Lists unsafe cosmetics. <b>6.2 getRecommendedCosm:</b> List recommended cosmetics.	<pre>Interface ICosmeticInfo {getCosmeticWarnings(); getRecommendedCosm();}</pre>

Subsystem Name	Subsystem Function	Subsystem Interface
<b>7. Medication &amp; Safety Management</b>	<p><b>7.1 searchMedication:</b> Allows search for safe/unsafe drugs.</p> <p><b>7.2 displaySafeMedications:</b> Shows approved drugs by trimester.</p> <p><b>7.3 displayUnsafeMedications:</b> Lists harmful medications.</p>	<pre>Interface ISearchMedication{ searchMedication(String name); List&lt;Medication&gt;}  interface IMedicationSafety { List&lt;Medication&gt; displaySafeMedications(int month); List&lt;Medication&gt; displayUnsafeMedications(int month); }</pre>
<b>8. Consultation &amp; Chat System</b>	<p><b>8.1 bookConsultation:</b> Books online doctor appointments.</p> <p><b>8.2 startChat:</b> Opens secure chat between mother and doctor.</p> <p><b>8.3 viewConsultationHistory:</b> Displays previous consultations and messages.</p> <p><b>8.4 startChat:</b> Provides a secure channel for conversations between mother and doctor.</p>	<pre>interface IConsultationService { void bookConsultation(String motherId, String doctorId, Date time); }interface IChatSystem{void startChat(String motherId, String doctorId); }interface IConsultationHistory{List&lt;Consultation&gt; viewConsultationHistory(String motherId); } interface ICommunicationSystem { ChatSession startChat(String motherId, String doctorId);</pre>
<b>9. Vaccination &amp; Growth Tracker</b>	<p><b>9.1 trackBabyVaccinations:</b> Tracks vaccinations based on Egyptian schedule.</p> <p><b>9.3 recordVaccination:</b> Records completed doses.</p> <p><b>9.4 trackGrowth:</b> Displays growth chart and stats.</p>	<pre>interface IVaccinationTracker { void trackBabyVaccinations(String babyId); void recordVaccination(String babyId, String vaccineName); GrowthData trackGrowth(String babyId); } interface ITrackGrowth{ GrowthData trackGrowth(); }</pre>



Subsystem Name	Subsystem Function	Subsystem Interface
<b>10. Depression Awareness &amp; Mental Health</b>	<p><b>10.1 showDepressionInfo:</b> Provides awareness content on prenatal/postnatal depression.</p> <p><b>10.2 selfAssessment:</b> Enables mothers to take a depression self-test.</p> <p><b>10.3 showCopingTips:</b> Offers relaxation and counseling resources.</p>	<pre>interface IMentalHealthModule { void showDepressionInfo();List&lt;Tip&gt; showCopingTips(); }  interface ISelfAssessment {selfAssessment(TestAnswers answers); }</pre>
<b>11. Exercise &amp; Physical Recovery Management</b>	<p><b>11.1 getPregnancyExercises:</b> Lists trimester-specific safe exercises.</p> <p><b>11.2 getPostpartumExercises:</b> Provides postpartum recovery exercises.</p> <p><b>11.3 logExerciseActivity:</b> Records daily exercise logs.</p>	<pre>interface IExerciseSystem { List&lt;Exercise&gt; getPregnancyExercises(int month); List&lt;Exercise&gt; getPostpartumExercises(int week); void logExerciseActivity(String motherId, ExerciseData data); }</pre>
<b>12. Breastfeeding &amp; Family Planning</b>	<p><b>12.1 manageBreastfeeding:</b> Tracks breastfeeding sessions and reminders.</p> <p><b>12.2 getContraceptiveInfo:</b> Displays available contraceptive options and side effects.</p> <p><b>12.3 getLaborComparison:</b> Displays detailed comparison of natural vs. C-section labor.</p>	<pre>interface IFamilyPlanning { void List&lt;Contraceptive&gt; getContraceptiveInfo(); void }  interface IContraceptiveInfo { manageBreastfeeding(BreastfeedSession session);}  interface ILaborCompare{ getLaborComparison();</pre>
<b>13. Emergency &amp; Alert System</b>	<p><b>13.1 emergencyContact:</b> One-click contact with doctor/hospital.</p> <p><b>13.2 19.3 issueCriticalAlert:</b> Triggers immediate alerts when readings are unsafe, advising doctor contact.</p>	<pre>interface IEmergencySystem { void emergencyContact(String motherId); }  interface IAlerts{ issueCriticalAlert(String motherId, ReadingData data);</pre>

Subsystem Name	Subsystem Function	Subsystem Interface
<b>14. Feedback &amp; Rating System</b>	<b>14.1 submitFeedback:</b> Allows mothers to submit feedback on doctors or the app. <b>14.2 viewRatings:</b> Displays average ratings for doctors.	<pre>interface IFeedbackSystem { void submitFeedback(String userId, FeedbackData feedback); List&lt;Feedback&gt; viewRatings(String doctorId); }</pre>
<b>15. Data Privacy &amp; Security Management</b>	<b>15.1 encryptData:</b> Encrypts sensitive information before storage. <b>15.2 verifyAccess:</b> Ensures authorized access to data. <b>15.3 backupDatabase:</b> Performs regular encrypted backups.	<pre>interface ISecuritySystem { String encryptData(String data); boolean verifyAccess(String userId, String resource); void backupDatabase(); }</pre>
<b>16. Search &amp; Recommendation Engine</b>	<b>16.1 searchContent:</b> Allows users to search doctors, exercises, or foods. <b>16.2 recommendNutrition:</b> Suggests nutrition plans based on profile. <b>16.3 recommendDoctor:</b> Recommends doctors based on specialization and location.	<pre>interface ISearch { List&lt;SearchResult&gt; searchContent(String keyword); } interface IrecommendNutrition {NutritionPlan recommendNutrition(String motherId); }interface IrecommendDoctor{List&lt;Doctor&gt; recommendDoctor(String location, String specialization); }</pre>
<b>17. Mother Interface &amp; Personalization</b>	<b>17.1 displayDashboard:</b> Shows an interactive dashboard with progress, symptoms, and reminders.	<pre>interface IPersonalizationSystem { DashboardData displayDashboard(String userId);}</pre>
<b>18. System Management &amp; Payments</b>	<b>18.1 processPayment:</b> Integrates with certified payment gateways to securely handle transactions. <b>18.2 manageSubscription:</b> Handles subscription mechanisms (status, renewal, cancellation).	<pre>Interface PaymentResult{ processPayment(PaymentData data); void manageSubscription(SubscriptionAction action);}</pre>

Subsystem Name	Subsystem Function	Subsystem Interface
<b>19. Specialized Health &amp; Tandem Care</b>	<p><b>19.1 logHealthReading:</b> Allows mothers to log health data (blood sugar, blood pressure). <b>19.2 analyzeHealthData:</b> Analyzes logged data against safe thresholds. <b>19.3 getTandemGuidelines:</b> Provides evidence-based safety guidance on breastfeeding while pregnant, including warning signs (contractions, bleeding). <b>19.4 getTandemNutritionAdvice:</b> Delivers customized nutritional advice for increased caloric and nutrient requirements. <b>19.5 getMilkChangeInfo:</b> Provides information on breast milk changes (e.g., shift to colostrum) and tips for managing aversion/refusal by the older child.</p>	<pre>interface ISpecializedCare { void logHealthReading(HealthReading reading); AnalysisResult analyzeHealthData(String motherId);} interface ITandemGuidance{ getTandemGuidelines(); NutritionAdvice getTandemNutritionAdvice(); MilkChangeInfo getMilkChangeInfo(); }</pre>

## 6. Traceability Matrix

Requirement	1. User Auth & Access Control	2. Mother Profile Mgmt	3. Baby Profile Mgmt	4. Doctor Profile Mgmt	5. Pregnancy Info Module	6. Nutrition & Diet Mgmt	7. Medication & Safety Mgmt	8. Consultation & Chat System	9. Vaccination & Growth Tracker	10. Depression & Mental Health	11. Exercise & Recovery Mgmt	12. Breastfeeding & Family Planning	13. Emergency & Alert System	14. Feedback & Rating System	15. Data Privacy & Security Mgmt	16. Search & Recommendation Engine	17. Mother Interface & Personalization	18. System Management & Payments	19. Specialized Health & Tandem Care
R1	✓														✓				
R2		✓															✓		
R3			✓						✓								✓		
R4				✓				✓								✓			

Requirement	1. User Auth & Access Control	2. Mother Profile Mgmt	3. Baby Profile Mgmt	4. Doctor Profile Mgmt	5. Pregnancy Info Module	6. Nutrition & Diet Mgmt	7. Medication & Safety Mgmt	8. Consultation & Chat System	9. Vaccination & Growth Tracker	10. Depression & Mental Health	11. Exercise & Recovery Mgmt	12. Breastfeeding & Family Planning	13. Emergency & Alert System	14. Feedback & Rating System	15. Data Privacy & Security Mgmt	16. Search & Recommendation Engine	17. Mother Interface & Personalization	18. System Management & Payments	19. Specialized Health & Tandem Care
R5		✓			✓						✓					✓	✓		✓
R6					✓											✓	✓		
R7						✓										✓			
R8							✓								✓	✓			
R9				✓				✓					✓	✓	✓	✓			

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R10										✓	✓					✓			
R11											✓					✓	✓		
R12											✓	✓							
R13													✓						
R14	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
R15								✓						✓					
R16	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
R17		✓	✓		✓	✓	✓		✓	✓	✓	✓					✓		✓
R18								✓							✓				
R19			✓						✓								✓		
R20		✓					✓										✓		
R21				✓	✓	✓	✓	✓	✓	✓	✓	✓				✓			✓
R22					✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓		✓	
R23					✓							✓							✓

Requirement	1. User Auth & Access Control	2. Mother Profile Mgmt	3. Baby Profile Mgmt	4. Doctor Profile Mgmt	5. Pregnancy Info Module	6. Nutrition & Diet Mgmt	7. Medication & Safety Mgmt	8. Consultation & Chat System	9. Vaccination & Growth Tracker	10. Depression & Mental Health	11. Exercise & Recovery Mgmt	12. Breastfeeding & Family Planning	13. Emergency & Alert System	14. Feedback & Rating System	15. Data Privacy & Security Mgmt	16. Search & Recommendation Engine	17. Mother Interface & Personalization	18. System Management & Payments	19. Specialized Health & Tandem Care
R24							✓				✓		✓						✓
R25	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
R26																		✓	

### 7. Initial GUI Sketches

Below are some wireframe sketches that demonstrate the expected user interface for the Byte-Jobs System.