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We are also very grateful to our families, whose belief in us provided strength in every challenge, and to our friends and colleagues, whose encouragement and thoughtful discussions enriched our experience.

This project, completed as part of our Software Engineering studies at **Al-Balqa Applied University**, is more than just an academic milestone, it is a reflection of the collective effort, belief in us and the inspiration we received. We would like to thank everyone who played a part in this journey.

Kind regards,
The Vital Team

Razan Samer Alajarmeh | Malak Raed Mohammad

Heba Ahmed Alznemat | Juman Ehab Barham

DECLARATION

We, ***the Vital*** Team, proudly declare that this project is our original work, developed as part of our graduation project at **Al-Balqa Applied University**, with all external resources duly credited. This project reflects our dedication and hard work. Our goal is to empower individuals to take charge of their health by providing the tools and knowledge they need to manage their well-being effectively, leading to a more informed community. We believe technology can support individuals in improving their health, paving the way for a future where everyone can live a healthier and more vital life. ***Viva Vital*** represents a step forward in promoting a conscious, health-focused lifestyle.

Note: This monograph has not been submitted to any other institution or university for the award of any other degree

Signed by

Razan Samer Alajarmeh **Malak Raed Mohammad**

Heba Ahmed Alznemat **Juman Ehab Barham**

ABSTRACT

Viva Vital — an innovative health application developed to support individuals managing the two most prevalent chronic illnesses in Jordan: hypertension and diabetes (types 1 and 2). The app offers user-friendly tools to monitor vital signs, track lifestyle habits, and stay informed about personal health. *Viva Vital* responds to the growing demand for accessible chronic disease management solutions by promoting consistent health monitoring and raising awareness of how everyday choices impact these conditions. Its intuitive design encourages proactive self-care, helping reduce the risk of complications. At its core, *Viva Vital* aims to build a more informed and health-conscious society. By providing users with both essential knowledge and practical support, the app encourages healthier lifestyles and contributes to improved individual well-being and public health.

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LIST OF ABBREVIATIONS

1. **SDLC**: **S**oftware **D**evelopment **L**ife **C**ycle.
2. **XP:** E**x**treme **P**rogramming.
3. **TDD: T**est **D**riven **D**evelopment.
4. **SWOT: S**trengths, **W**eaknesses, **O**pportunities and **T**hreats.
5. **VVV: V**i**v**a **V**ital.
6. **INVEST: I**ndependent, **N**egotiable, **V**aluable, **E**stimable, **S**mall and **T**estable.
7. **HBA1C: H**emoglobin **A1c**.
8. **EERM: E**nhanced **E**ntity **R**elationship **M**odel.
9. **PHP: Hyp**ertext **P**reprocessor.
10. **JSON: J**ava**S**cript **O**bject **N**otation.
11. **XML: Ex**tensible **M**arkup **L**anguage.
12. **DRY: D**on’t **R**epeat **Y**ourself.

Chapter 1: Introduction

1.1 About the Application

"Viva Vital" is a mobile application designed to support overall well-being. In a world where chronic diseases like hypertension and diabetes are rising significantly due to genetics and unhealthy lifestyle habits, managing health has become more than just a necessity, it's a lifelong commitment. Our app, ***Viva Vital***, was created with the intention of bridging the gap between technology and healthcare, making it easier to manage and track one's health condition.

We believe that maintaining good health should not be a challenge but a natural part of daily life. ***Viva Vital*** is more than just an app, it is a dedicated health companion, a reliable guide, and a safeguard against the risks associated with unmanaged chronic conditions such as hypertension and diabetes. By integrating smart medication reminders, personalized health insights, lifestyle recommendations, and a holistic approach to well-being, we strive to revolutionize how individuals monitor, manage, and improve their health.

1.2 Research-Driven Need for Viva Vital

1.2.1 Common Health Challenges in Jordan

After conducting research on major public health issues in Jordan, we found that **diabetes** and **hypertension** are among the most spread chronic illnesses. These conditions are often caused or worsened by **obesity, a sedentary lifestyle, smoking, high blood pressure**, and **blood lipid disorders**. This understanding emphasized the urgent need for a health app like ***Viva Vital*** that helps users monitor their health status, track their progress, and adopt healthier habits, aiming to reduce the risk and impact of these illnesses. [1]

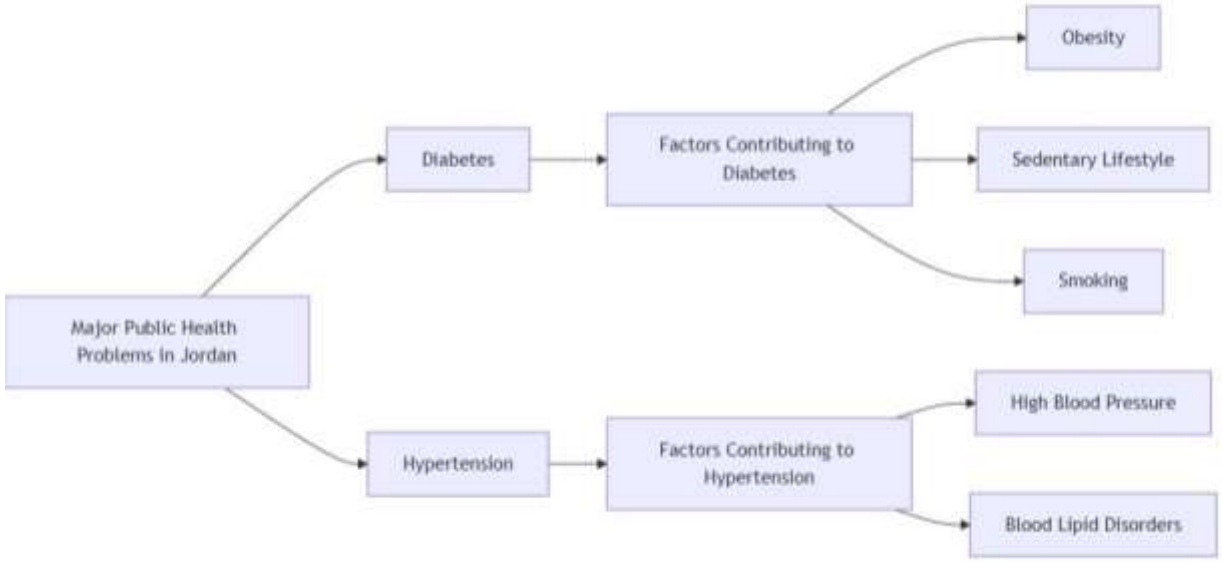


Figure 1.1: Major Health problems in Jordan [2]

1.2.2 Statistics and Prevalence

This study indicates the prevalence of **hypertension** and **diabetes** in Jordan. The findings highlighted the percentages of people affected by these chronic conditions, reinforcing the urgent need for an easy-to-use health management app.

Diabetes is considered a major public health problem in Jordan, accounting for 7% of deaths in 2019. Previous studies have shown an increasing trend in its prevalence with age in both genders in Jordan. The prevalence of diabetes rose from 13.0% in 1994 to 17.1% in 2004, 22.2% in 2009, and 23.7% in 2017. It is noted that there are many factors contributing to this disease, such as a **sedentary lifestyle** and **smoking**. However, the combined impact of these factors on diabetes is much lower than the effect of **obesity**."

As for hypertension, according to Al-Qaoud, it represents a major public health problem in Jordan, with "33.8% of men and 29.4% of women suffering from it.

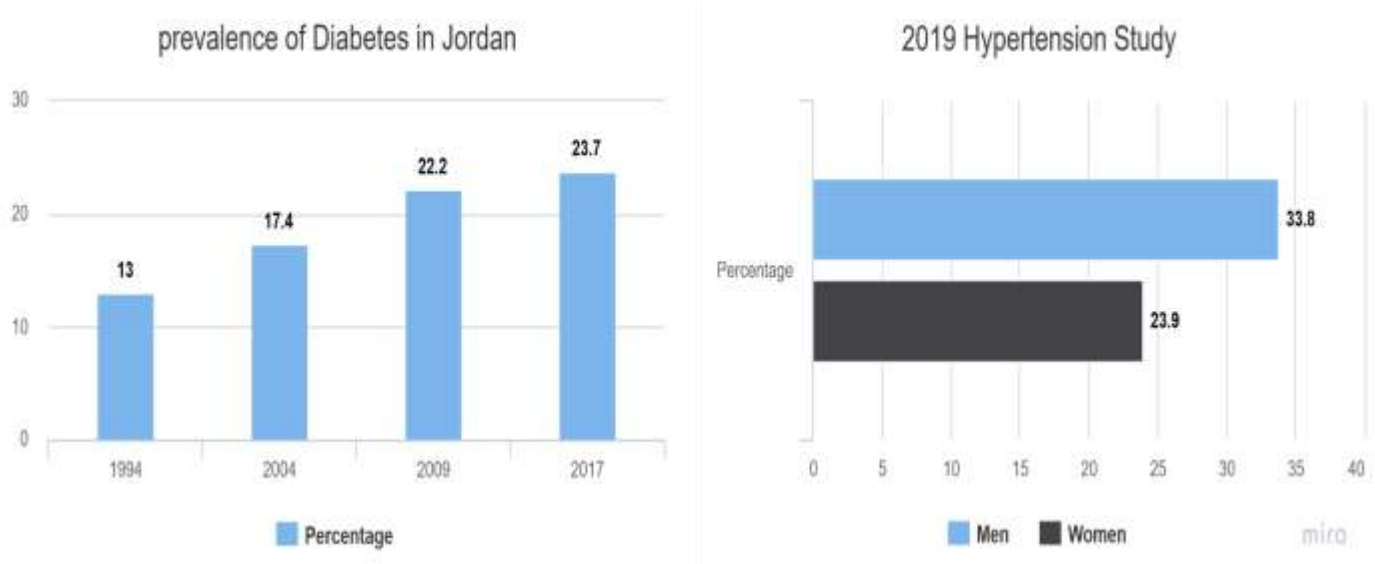


Figure 1.2: Local Diabetes & Hypertension Study [3]

1.3 Software Development Life Cycle (SDLC)

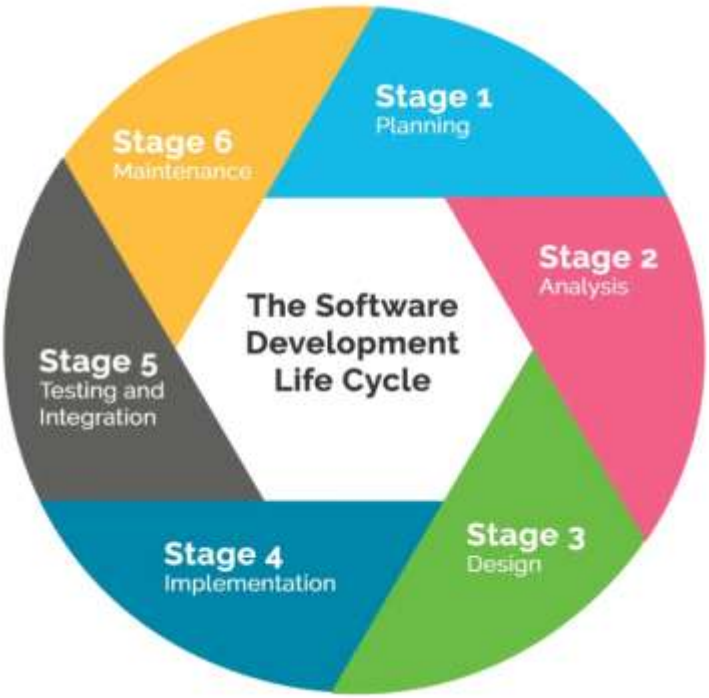


Figure 1.3: SDLC [4]

Software development life cycle **(SDLC)** is a structured process that is used to design, develop, and test good-quality software. **SDLC** is a methodology that defines the entire procedure of software development step-by-step.

This model aims to deliver high-quality, maintainable software that meets stakeholder needs. It provides a detailed plan, breaking development into manageable modules. By outlining each stage, **SDLC** ensures efficiency, cost-effectiveness, and timely delivery while meeting user requirements.

As shown in the **figure 1.3**, **stages of the software development life cycle are:**
Stage 1: Planning
Stage 2: Analysis
Stage 3: Design and prototyping
Stage 4: Implementation
Stage 5: Testing and integration
Stage 6: Maintenance and Deployment

1.2.1 Planning

In the planning phase, we focused on addressing major chronic health issues in Jordan, especially hypertension and diabetes. Our goal was to bridge the gap between health awareness and technology through a mobile app that helps users manage their health. We conducted research, user analysis, and a feasibility study to ensure the app could offer features like healthy recipes, exercise plans, medication reminders, and health tracking. We also defined success criteria and communication strategies to ensure a positive user experience.

1.2.2 Analysis

During the analysis phase, we defined system requirements, prioritized features using tools like Miro, and integrated Extreme Programming (XP) within the Scrum framework. Each Sprint involved detailed technical analysis and component breakdown, allowing flexibility for future changes, reducing risks, and shaping a clearer development roadmap.

1.2.3 Design and Prototyping

We began with low-fidelity wireframes using Whimsical to brainstorm and visualize the app's layout and user flow. This helped reduce risks and align with the project's goals. Later, high-fidelity prototypes were built in **Figma,** allowing for continuous feedback, easy edits, and team collaboration to ensure the final design was user-friendly, accessible, and health-focused.

1.2.4 Implementation

In the implementation phase, we translated system specifications into a fully functional health app through coding, testing, and updates in each Scrum Sprint. We focused on building a user-friendly and flexible interface, using modern tools for performance tracking and optimization. Continuous improvements ensured Viva Vital became a responsive, efficient, and reliable solution that met and exceeded user expectations.

1.2.5 Testing and Integration

We performed extensive testing throughout the development to ensure ***Viva Vital's*** functionality, performance, and user experience. This included unit, system, integration, and user acceptance testing. Key modules were successfully integrated, and performance was tested under various conditions. Multiple bug fixes and optimizations were applied to deliver a stable, smooth, and efficient final product.

1.2.6 Maintenance and Deployment

In the maintenance phase, we ensured long-term system reliability through continuous updates, security enhancements, and performance improvements. By following Scrum and XP practices like continuous integration, Viva Vital became easy to maintain and upgrade. User feedback drove refinements, making the app more user-friendly and expanding its health features to better serve public health needs in Jordan.

1.3 Scrum Methodology

Scrum is a management framework that enables teams to be more organized and work towards a shared goal. It defines a set of meetings, tools, and roles to ensure efficient project delivery. Scrum practices are having good self-management, learning from past experiences, and adapting quickly to change. The team works towards a goal within a set period (sprint), with the purpose of meeting the target.

The core idea of Scrum is to break the development process into smaller, manageable pieces. Through careful planning, the team builds a minimal feature set, tests it, reviews it, and prepares it for shipment, this supports Scrum's main goal of delivering a usable product increment at the end of each sprint. Each sprint ends with a potentially shippable product. This cycle is repeated over several sprints until the product is feature-complete.

Scrum also helps enhance existing engineering practices within an organization. By incorporating frequent management activities, Scrum consistently identifies deficiencies in the development process and practices, allowing for continuous improvement and adjustment.

1.3.1 Key skills required in scrum methodology:

1. Leadership skills: Acts both as a facilitator and a guide, helping the team by removing obstacles, providing tools, and organizing the team's schedule.

2. Critical thinking and problem solving: Enables the team to analyze complex situations, identify potential issues before they become problems, and develop effective solutions.

3. Adaptability and Flexibility: The ability to embrace change and adjust strategies as needed to accommodate new updates. This resilience ensures that the team remains productive and continues moving forward.

4. Conflict Resolution: Manage and resolve conflicts between team members or stakeholders to maintain a collaborative environment.

5. Technical Skills: It enables the team to communicate effectively with the development team and understand the challenges they might face.

6. Strong facilitation skills: It leads team members to increase productivity and reduce miscommunication.[5]

1.3.2 Scrum Team

1. **Product Owner:** Ensures the team delivers maximum value by prioritizing user and customer needs.
2. **Scrum Master:** Champions Scrum, coaches teams, and optimizes processes for effective delivery.
3. **Scrum development team**: A cross-functional team with diverse skills, collaborating to avoid bottlenecks in delivery.

1.4 XP methodology

Extreme Programming (XP) is a Software Development Methodology, known for its flexibility, collaboration and rapid feedback using techniques like continuous testing, frequent releases, and pair programming, in which two programmers collaborate on the same code. XP supports user involvement throughout the development process while prioritizing simplicity and communication. Overall, XP aims to deliver high-quality software quickly and adapt to changing requirements effectively. **Five Phases of Extreme Programming are:**

- Planning.
- Design.
- Coding.
- Testing.
- Listening

Extreme Programming (XP) allows developers to respond to user stories, adapt quickly, and make real-time modifications.

1.4.1 Values of Extreme Programming:

1. Communication: Close collaboration ensures constant information sharing, preventing surprises and wasted effort.

2. Simplicity: Prioritizing clear, adaptable code over complexity reduces bugs and accelerates progress.

3. Feedback: Continuous input from users, testers, and teammates helps catch issues early and refine work efficiently.

4. Respect: Valuing honesty, diverse opinions, and collective expertise fosters a productive team environment.

5. Courage: Encouraging open discussions and bold ideas creates a safe space for innovation, supported by quick error detection. [6]

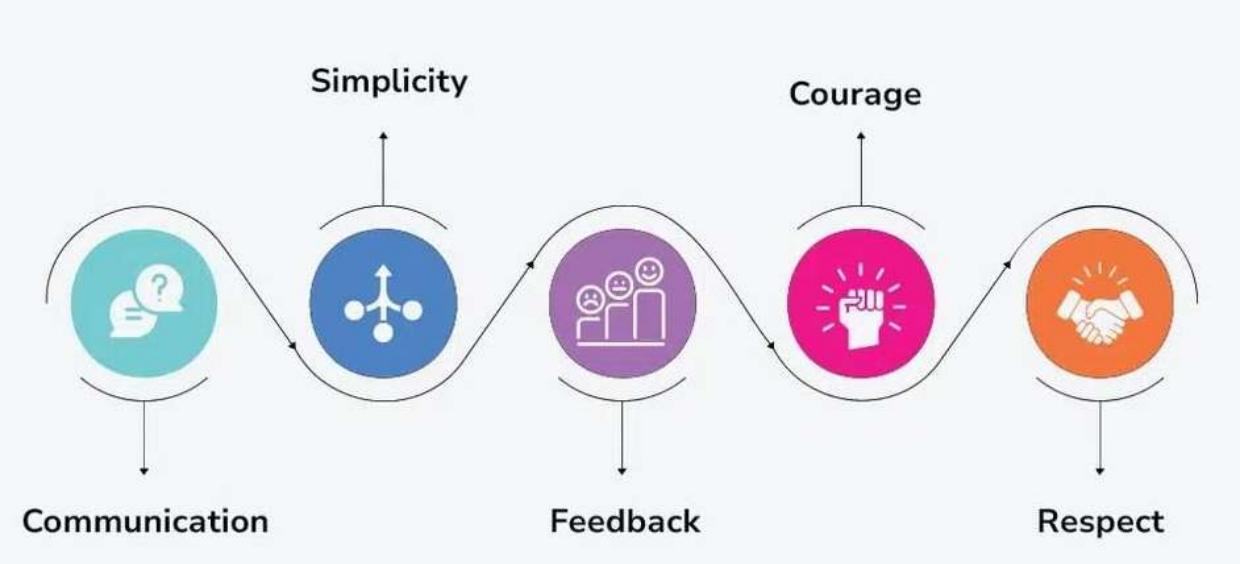


Figure 1.4: Core values of XP

1.5 Research Study on Integrating XP with Scrum

The integration offers numerous benefits for software development teams. Since scrum and XP are complementary methods, most practices overlap, except for the planning part. By embedding XP practices into Scrum, teams can enhance code reliability, reduce defects, and maximize collaboration.

1.5.1 Benefits of Scrum/XP hybridization

Hybridization improves code quality through practices like test-driven development **(TDD),** which ensures rigorous testing before implementation, reducing errors. Pair programming supports real-time knowledge sharing and efficient problem-solving, while continuous integration helps quickly merge code changes, minimizing conflicts and deployment issues.

It also enables faster development cycles without worsening quality. XP's frequent releases and feedback loops complement Scrum's sprint-based delivery, allowing teams to adapt quickly while maintaining stability.

Additionally, hybridization supports a sustainable development pace. Refactoring prevents codebase deterioration, and collective code ownership promotes team-wide knowledge sharing, reducing dependency on specific individuals. With each iteration, product increments are delivered, and customers can prioritize features while the development team remains self-organized and collaborative.

1.5.2 Scrum/XP Hybridization: Key Elements

The Scrum/XP hybridization combines essential elements from both frameworks to enhance agility and efficiency. Key components include:

Roles (Adopted from Scrum)

- **Product Owner**: Defines and prioritizes the product backlog to maximize value.
- **Scrum Master**: Facilitates Scrum processes and ensures the team follows best practices.
- **Development Team**: A cross-functional team responsible for delivering increments of the product.

Artifacts (Adopted from Scrum)

- **Product Backlog**: A prioritized list of features and requirements.
- **Sprint Backlog**: A subset of the product backlog selected for development during a sprint.

Scrum Ceremonies (Entirely Integrated from Scrum)

- **Sprint Planning Meeting**: The team selects and plans work for the sprint.
- **Daily Scrum Meeting**: Short daily meetings to study progress and find defects.
- **Sprint Review**: Illustration of completed work and gathering feedback.
- **Sprint Retrospective**: Reflection on the sprint to improve future iterations.

XP Practices Integrated into Scrum

- **Simple System Design**: Focuses only on what is necessary for current functionality.
- **Test-First Development (TDD)**: Tests are written before code, helping developers understand expectations and produce cleaner code
- **Pair Programming**: Two developers work together at one computer: one writes code while the other reviews, frequently switching roles.
- **Refactoring**: Incremental code simplification and improvement, often more efficient when combined with pair programming.
- **Continuous Integration**: Developers merge their work multiple times a day, building and testing the code to ensure stability (Mar, 2002 [7] [8])

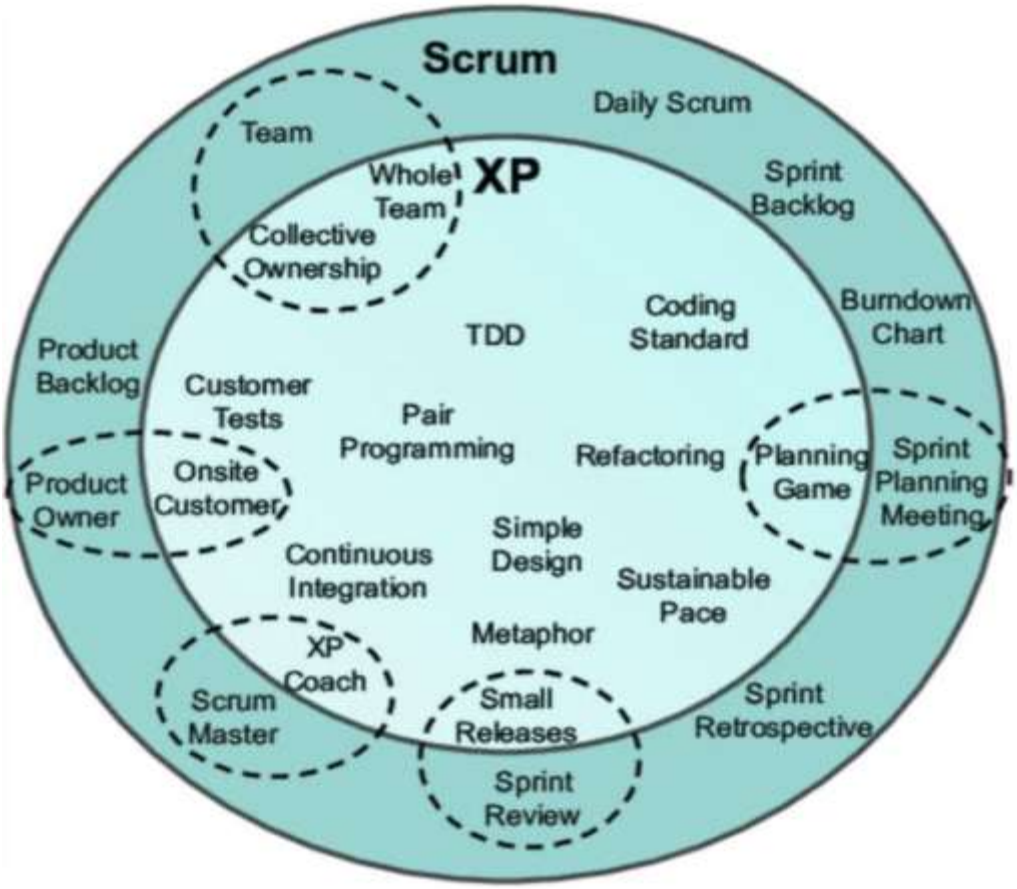


Figure 1.5: Scrum and XP Practices [8]

Chapter 2: Planning Phase

2.1 Introduction to Planning Phase

Planning in SDLC is crucial as it defines project goals, requirements, constraints, and timelines. It ensures that development teams understand the scope of work and can allocate resources effectively, ultimately reducing risks and improving project outcomes.

In Scrum methodology, the planning phase is a primary step that occurs at the beginning of each Sprint. It also a continuous process that involves the entire team, ensuring that everyone is working towards a common goal.

2.2 project scope and setting boundaries

Key activities in the Planning Phase are:

1. Business Profile: incorporates business goals and objectives, business description, products/services, target market, logo, Strategic Planning, app overview, team introduction, app name origin, and core health focus.

2. Definition & Description of the app: Provides a detailed analysis of the existing app or system, highlighting its goals, ideas, and challenges.

3. Purpose of the product: Defines the core purpose, motivations, and objectives that drive the app's existence and development.

4. SWOT Analysis: Utilizes Sprint Planning and Product Backlog Refinement to identify key factors impacting the app and develop strategies for successful development.

5. App's Requirements: Includes background/ domain research, core functional and non-functional requirements of the application, presented as user stories.

6. Performing project estimation: Comprehensively outlines project details, including tasks, budget, resources, schedule, deadlines, and potential risks associated with the app.

7. Implementation Plan: Identifies the major milestones and phases for developing the app's infrastructure across each sprint.

2.3 Business profile: Viva Vital mobile app

Figure 2.1: Logo

2.3.1 Viva Vital Logo: Design Rationale

The logo displayed above represents ***Viva Vital's*** mission through its design, which depicts simplicity, health, and vitality while keeping a calming and minimalistic aesthetic. It uses a single light color, turquoise, which is visually appealing without overwhelming the viewer's eyesight, and signifies trust, care, and wellness.

The design presents a leaf-shaped element above the apple, which also resembles the heart, showcasing the importance of healthy food in maintaining a strong heart, and thus a strong body. This combination highlights how good nutrition and healthy habits lead to overall well-being. Additionally, the logo incorporates pulse-shaped ***"VVV"*** lettering, representing the abbreviation of ***Viva Vital*** while reflecting the app's role in tracking vital measurements, medication dosages, water consumption, and fitness reminders.

2.3.2 Viva Vital Name: Origins and meaning

The name ***"Viva Vital"*** was chosen to reflect life and vitality. The word ***"Viva"*** derived from both Spanish and Latin, means **"Long Live"** in Spanish and **"Alive"** or **"To Live"** in Latin. It symbolizes the importance of living well, enjoying life, and embracing a lively spirit. The addition of ***"Vital"*** emphasizes the essential role that health plays in achieving a fulfilling life, as it also refers to the **"Vital measurements",** the regular measurements typically taken to monitor one's health. These measurements are fundamental in managing overall well-being and are a key characteristic of the app.

Moreover, the word **"Vital"** reflects us, the **Vital Team**, as we are still young, healthy, and full of vitality. This dual meaning in the name not only expresses the core values of health and well-being but also represents our team's mission of empowering users to take charge of their health, helping them live an active life.

All in all, the name ***"Viva Vital"*** sends a clear message: live a happy, healthy, and long life filled with vitality.

2.3.3 A Brief About Our Team: The Vitals

We, The Vitals, feel blessed to be healthy, free from chronic illnesses like hypertension and diabetes, and consider it our responsibility to raise awareness and induce health management. Driven by gratitude and a genuine desire to make a difference, we are passionate about creating a positive impact. We believe that even the smallest actions can lead to significant changes. With compassion, we hold onto the hope that by spreading awareness and education, we can make the world a healthier place for everyone.

2.3.4 Mission: Your Health, Our Priority

The app is designed to offer a user-friendly platform that enhances the lives of individuals with chronic, lifelong health conditions, specifically hypertension and both types of diabetes (type 1 and type 2). With features like personalized medication reminders, appointment alerts, daily healthy recipes, exercise reminders, real-time progress monitoring, and a wellness center filled with helpful information, advice, and relevant advertisements.

Viva Vital is dedicated to improving users' health by providing the right tools, resources, and information to help individuals understand their health conditions and make better choices for their wellness.

2.3.5 Vision: A Healthier Future, One Step at a Time

With eyes set on the future, The Vitals aim to continue inspiring people to be fully aware of the potential risks of chronic lifelong diseases. Our vision includes a number of enhancements, adding numerous other common chronic diseases into the app, and raising awareness about their etiology. Additionally, we are dedicated to advancing healthcare technologies, and in the future, we envision integrating the app with smartwatches to enable real-time health tracking. Through this incorporation, users will be able to monitor their vital signs continuously and consistently.

We started small, just in Jordan, and we aim to expand globally, bringing the app worldwide to assist everyone suffering from chronic diseases, reaching communities all over the world to promote health awareness and prevention on a broader level, and creating a supportive community for individuals with diseases.

For us, the greatest reward is the positive impact we make. True satisfaction comes from seeing our loved ones healthy and happy, the healthy becoming more aware, and those already affected by illness improving their wellness and staying on track. ***The Vitals*** look forward to utilizing technology and healthcare to help prevent diseases before they occur, rather than treating them after.

2.3.6 Services Offered

Application Services:

1. **Vital Sign Tracking:** Monitor health metrics like blood pressure, blood glucose, and heart rate.
2. **Medication Reminders**: Set alerts to take medications on time.
3. **Doctor Appointment Reminders:** Get reminders for doctor appointments and scheduling.
4. **Health Insights & Reports:** Generate and share health reports with healthcare providers.
5. **Educational Resources:** Access information on managing chronic conditions.
6. **Lifestyle Recommendations:** Receive personalized tips on diet, exercise, and stress management.
7. **Symptom Logging:** Track symptoms for better health management.
8. Health Trend Graphs: Visualize vital sign trends over time.

Core values:

1. **Responsibility**: Helping people live healthier lives and supporting those with chronic diseases through regular monitoring.
2. **Innovation**: Providing regular updates and advice to help users track and improve their health.
3. **Quality & Confidentiality:** Offering reliable services that ensure high quality, user satisfaction, and data privacy.
4. **Prevention**: Focusing on early detection and taking steps to stop diseases from getting worse.
5. **Support**: Giving helpful recommendations and guidance to assist users in managing their health.

App Overview:

The app aims to prioritize ease of use, offering a clean and accessible interface that allows users to navigate the application quickly and efficiently. This user-centered design improves the overall usability of the app and helps users monitor their health status in real time. By enabling faster access to vital health information, the app reduces the risk of deterioration of health conditions.

2.4 Definition & Description

Viva Vital is a health app designed to support individuals in Jordan with chronic conditions, especially hypertension and diabetes. It provides personalized healthy recipes based on users' needs, including meal types, calorie counts, and ingredient preferences like sugar-free or low-salt options. The app helps users schedule physical activity, sends reminders for medications and appointments, and offers nutritional advice to reduce disease complications.

The app also suggests relevant consultants, sends reminders for upcoming check-ups, and offers updates and educational content to enhance health awareness. While Viva Vital offers a comprehensive tool for chronic condition management, challenges include integrating health data, encouraging consistent user engagement and helping elders with poor tech-savvy to use the app easily.

2.5 Purpose of the Product

The app responds to the increasing prevalence of chronic illnesses in Jordan and the need for dependable tools to track medications, appointments, nutrition, physical activity, and vital sign. Its main goals are to improve health outcomes, support treatment adherence through reminders, encourage healthy eating with meal options, promote regular exercise with guided schedule, and raise awareness with clear educational content called wellness center.

Users can monitor daily log for tracking physical symptoms, stress levels, and vital signs such as blood pressure, blood glucose (depending on the condition), hospital vital measurements of heart rate, oxygen saturation, respiratory rate, weight, and HbA1c percentage. Moreover, the app provides timely appointment reminders, suggests relevant consultants, and allows customization based on patient needs. It also includes activity tracking features to motivate users and is designed with data privacy and security to protect users' health information. Lastly, progress tracker page is made to track measurements including BMI, helping users stay informed about their progress and identify areas that may need further improvement.

2.6 SWOT Analysis

SWOT is an approach that stands for **S**trengths, **W**eaknesses, **O**pportunities and **T**hreats. This approach enables our scrum team to leverage our strengths, address weaknesses, capitalize on opportunities, and proactively manage threats before they escalate.

Figure 2.2: SWOT Approach [9]

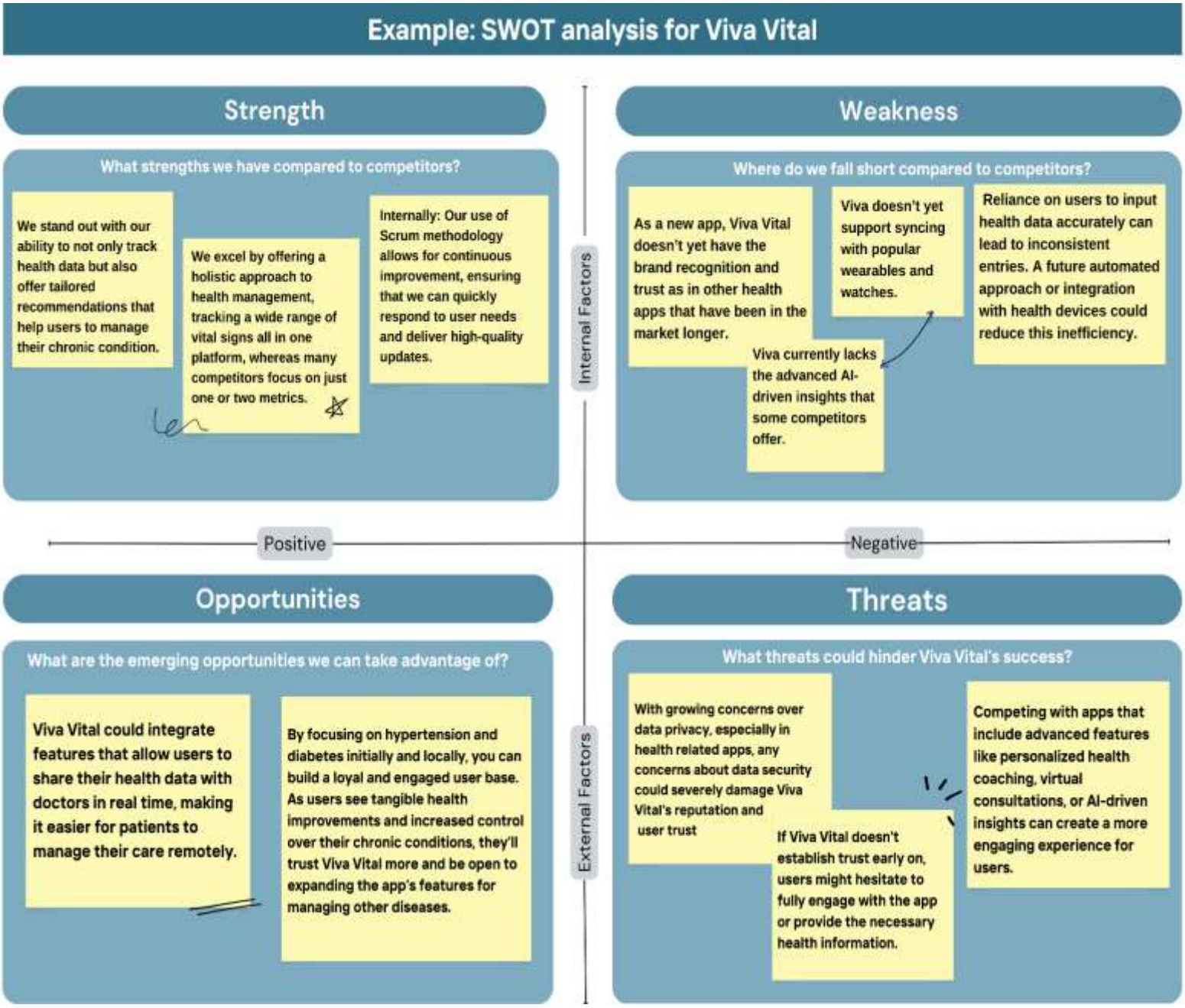


Figure 2.3: Viva Vital SWOT Analysis [10]

Chapter 3: Requirements Analysis Phase

3.1 Introduction to Analysis Phase

Requirements analysis is the process of gathering, analyzing, and documenting the needs and expectations of all stakeholders in a project. The goal of this analysis is to define clear and precise requirements for the system or product being developed, ensuring that the project meets user needs and achieves the set objectives. Requirements analysis involves understanding challenges, setting priorities, and ensuring that all requirements are feasible and aligned with the overall project goals, saving time and effort during the implementation and development stages.

3.2 Scrum Framework: Requirements to Feedback Cycle

The Scrum Framework transforms initial requirements into continuous user-centered improvements through an iterative development cycle. It begins with understanding the end users through **personas.** From these personas, high-level features known as **epics** are defined. These epics are then broken down into detailed **user stories,** each describing a specific functionality from user's perspective.

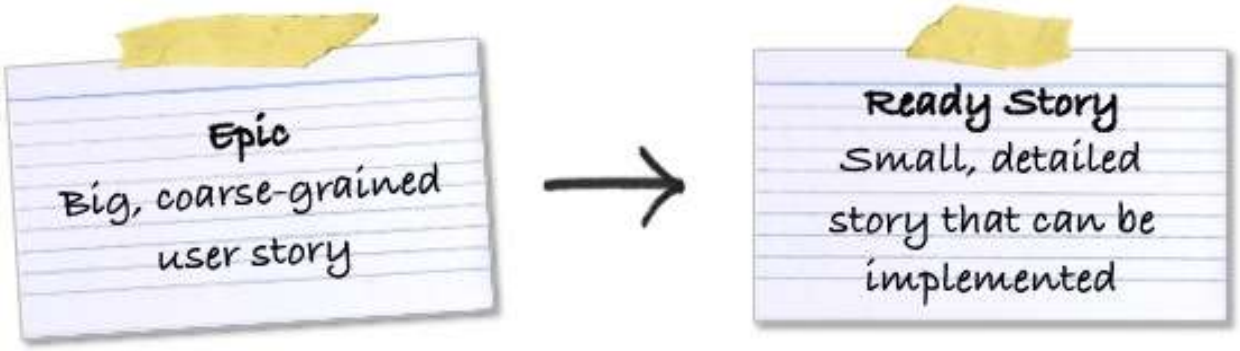


Figure 3.1: Epics to User Stories

As **Figure 3.1** illustrates, once several user stories are written, the team organizes them via **user story mapping** to visualize the user's journey and prioritize features based on value and usability.

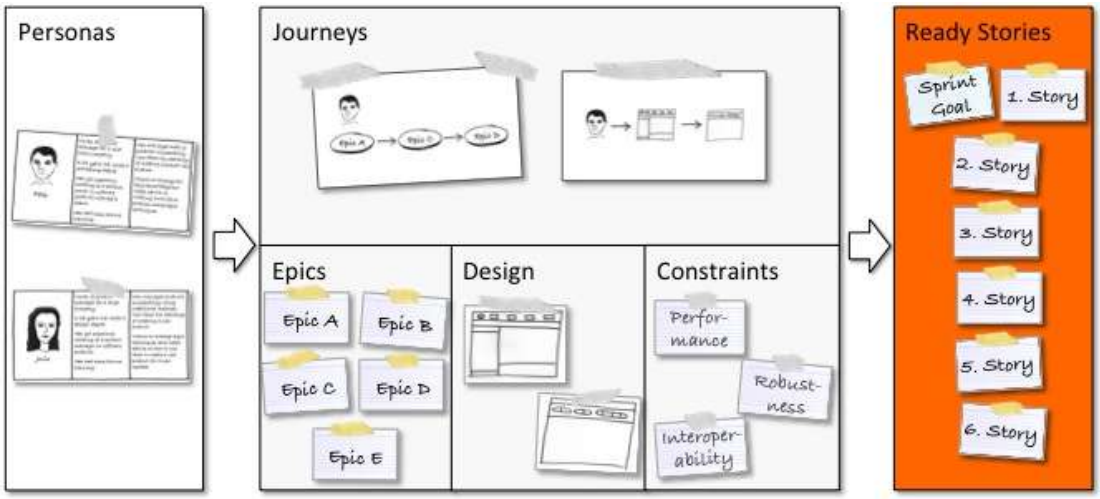


Figure 3.2: From Personas to Ready Stories

After refining and prioritizing, user stories are placed into the **product backlog**, ready to be pulled into a **Sprint**, where a selected set of stories is developed. The **Sprint cycle** includes planning, daily standups, development, review, and **retrospective reviews**. At the end of each Sprint, an increment ready for release is delivered and demonstrated in the **Sprint Review**, where **user feedback** is collected. This feedback helps refine existing requirements or introduce new ones, feeding back into the backlog for future Sprint planning. [11]

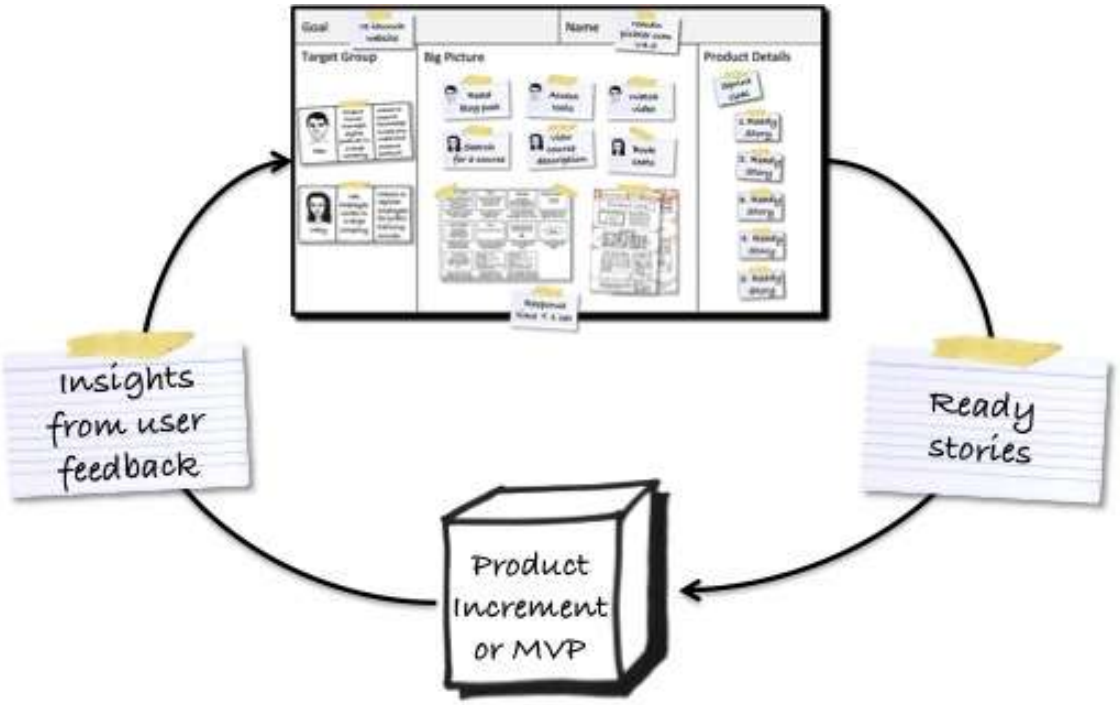


Figure 3.3: Sprint Cycle

3.3 User persona

A **user persona** is a character based on real user data, representing the goals, motivations, and how the app can support the needs of target users. It is used to guide design and development decisions by keeping the focus on real user expectations.

3.3.1 User Research: From Group Study to Personas

Studies have shown that people feel and empathize individuals rather than a group of people. Therefore, based on a **local group study** conducted among our relatives and friends as shown in **Figure 3.4** we gathered insights and shaped the results into three user personas: **Othman, Sameer, and Sama**, to ensure the app addresses the actual needs of our target audience. [12]

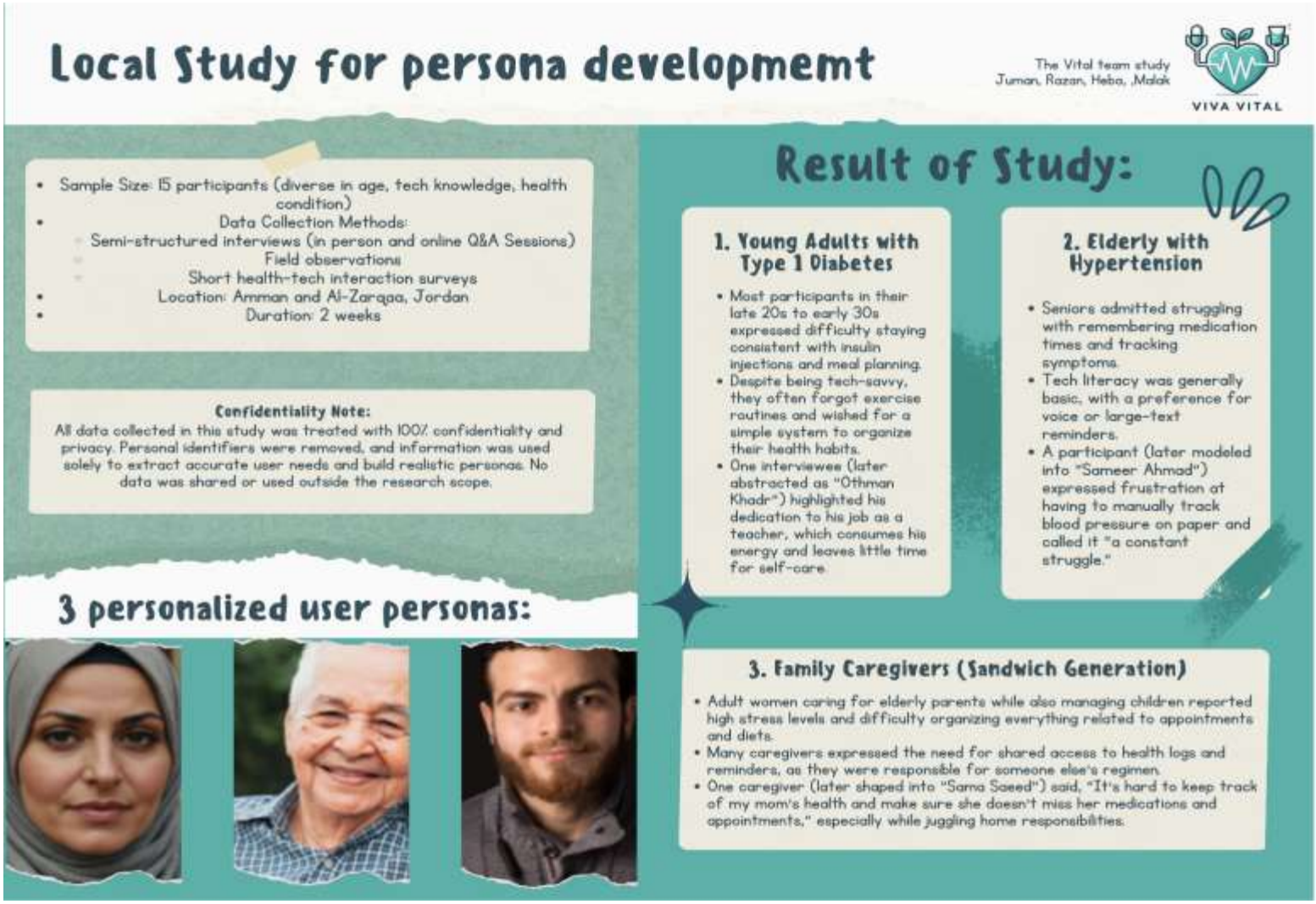


Figure 3.4: Local Study [13]

Customer Profile

As a single, primary school teacher, I need to stay healthy and energized for my students. With a busy schedule, I struggle to find good recipes and often forget my injections and exercise.

Goals

- Set reminders for insulin injections and medications.
- Get daily exercise reminders.
- Find simple and nutritious recipes for busy schedules.
- Have appointment reminders to track HBA1C.

"Every day feels like a battle; I need help balancing my glucose levels and staying disciplined with my diet."

How Viva helps

- Automated reminders for daily measurements, medications, and appointments, including HBA1C.
- Offering daily exercise notifications.
- Simple, nutritious recipes that help manage type 1 diabetes.

Othman Khadr

-Age : 31

-Occupation: Teacher

- Health Condition: Type 1 diabetes

- Tech-Savvy: Proficient

Motivation

Aims to stay healthy and energized to be the best teacher for his students while effectively managing Type 1 diabetes and preventing it from worsening.

Figure 3.5: Othman's Persona

"I just wish health tracking wasn't such a constant struggle."

Sameer Ahmad

-Age : 72

-Occupation: Retired Office Manager

- Health Condition: Hypertension

- Tech-Savvy: Basic

Customer Profile

As a retired grandfather, I spend most of my time alone at home. Managing my health is my responsibility, especially since I have hypertension. I need reminders for my daily measurements and a way to keep track of my health.

Goals

- Monitor blood pressure regularly
- Maintain a low-sodium diet to help manage hypertension.
- Receive timely medication and appointment reminders.
- Track symptoms to prevent complications

How Viva helps

- Automated reminders for daily measurements, medications, and appointments.
- Health tracking for measurements.
- Insights based on health data to suggest lifestyle changes and advices.
- Dietary suggestions that help manage hypertension

Motivation

Desires better control over health, seeks consistency in monitoring and managing health conditions

Figure 3.6: Sameer's Persona

"It's hard to keep track of my mom's health and make sure she doesn't miss her medications and appointments."

Sama Saeed

-Age: 38

-Occupation: Housewife

-App usage: Managing her mother's health.

-Mother's Age: 77

- Health Condition: Type 2 diabetes and hypertension

- Sama's Tech-Savvy: Proficient

Customer Profile

As a mom of four, I care for my mother with Alzheimer's, tracking her health, taking her on walks, and making specialized meals. Sometimes I find it hard to manage everything and not forget anything.

Goals

- Reduce the stress of multitasking by using an app to stay organized.
- Avoid missing any pills, injections or appointments.
- Remember daily walks.
- Provide specialized meals that meet dietary needs.

How Viva helps

- Prevent missed medications, injections, and appointments with timely reminders.
- Provide specialized meal suggestions depending on her mother's dietary needs.
- Offer exercise reminders to stay active.
- Include a progress tracker.

Motivation

Sama strives to care for her mother despite Alzheimer's challenges. While balancing motherhood, she wants to stay organized, meet her mom's health needs, and find peace of mind.

Figure 3.7: Sama's Persona

3.4 Product Backlog

Theme: Public Health Awareness and Chronic Disease Management.

Aims to provide users with accessible health management tools, educational content, and a structured system for tracking and improving health and well-being.

3.4.1 Epics

Epics in Viva Vital could be structured as high-level features or capabilities that directly align with the product's goals of supporting users with chronic disease management, health tracking, and public health awareness. These epics will be further broken down into smaller user stories for development. The list of **epics** for **Viva Vital's** backlog:

Epic 1: User Onboarding and Authentication

- Title: Secure User Registration and Login
- Description: Implements a secure and user-friendly authentication system, including:

1. Splash Screen: A brief introduction to the app.
2. Login: Secure user authentication.
3. Sign-Up: Requires user details such as full name, national ID, phone number, gender, height, weight, and medical conditions.
4. Forgot Password: Secure password recovery system.

- Benefit: Ensures secure and easy access, increasing user trust.
- Stakeholders: Users, technical support team.

Epic 2: Personalized Health Tracking and Monitoring

• Title: Health Status and Daily Measurements
• Description: Enables users to monitor their health conditions, including:
1. Vital Measurements: Input and track blood pressure, heart rate, oxygen level, glucose level, and respiratory rate.
2. Daily Measurement Reminders: Alerts for tracking key health metrics.
3. HBA1C Tracking: Monitoring HbA1C levels for diabetes patients.
4. Medical Appointment Management: Schedule and receive appointment reminders.
5. Periodic Health Reports: Generate detailed health reports for doctors.
6. Lab Test Reminders: Notifications for routine lab tests (e.g., cholesterol, kidney function).
• Benefit: Empowers users to take control of their health and make informed decisions.
• Stakeholders: Users

Epic 3: Meal Planning and Nutrition Support

• Title: Personalized Meal Plans and Nutrition Advice
• Description: Provides customized nutrition plans based on one's condition, including:
1. Personalized Meal Recommendations: Diet plans based on health needs.
2. Specialized Diets for Chronic Conditions: Nutrition guidance for diabetes, hypertension, and other conditions.
3. Meal and Hydration Reminders: Alerts to maintain proper nutrition habits.
4. Calorie Tracking: Monitoring daily calorie intake based on the nutritional content of consumed food.
• Benefit: Helps users maintain a healthy diet tailored to their needs.
• Stakeholders: Users

Epic 4: Fitness and Exercise Management

• Title: Personalized Fitness alerts
• Description: Offers exercise reminders for users, including:
1. Health-Based Workout Plans: Personalized exercise reminders based on the user's selected workout type and preferred time.
2. Exercise Scheduling: Enables users to plan, modify, or delete their workout reminders for flexible fitness management.
3. Exercise Reminders: Timely notifications to encourage a consistent fitness routine, including reminders to stay hydrated while exercising.
• Benefit: Improves users' physical fitness and overall health.
• Stakeholders: Users.

Epic 5: Medication Management and Treatment Reminders

• Title: Medication Tracking and Alerts
• Description: Helps users manage their medications effectively, including:
1. Medication Scheduling: Users can log prescribed medications, dosages, and intake frequency.
2. Medication Alerts: Automated reminders for medication intake.
3. Refill Notifications: Alerts when prescriptions need to be refilled.
4. Medication Reports: Insights on users' medication habits, easy to share with doctors.
• Benefit: Reduces the risk of missed doses and enhances treatment adherence.
• Stakeholders: Users.

Epic 6: Progress Monitoring

• Title: Interactive Health Progress Tracking

• Description: Provides users with a comprehensive view of their health progress, including:

1. Graphical Health Trends: Charts showing progress in several key health metrics.
2. Activity and Nutrition Impact Analysis: Summarizes the effect of diet and exercise on health.
3. BMI Calculation and Tracking: Continuously monitors BMI changes to help users maintain a healthy weight range.
4. Future Health Tips: Recommends actions to avoid, such as skipping workouts or poor dietary choices, to prevent further health deterioration.

• Benefit: Enhances user motivation and engagement by visualizing health improvements.

• Stakeholders: Users.

Epic 7: Activity Tracking

·Title: Daily Activity Monitoring and Feedback

·Description: Tracks user's daily physical activity and provides personalized feedback, including:

1. Activity Tracking: Monitors daily accomplishments and healthy habits.
2. Personal Goal Setting: Allows users to set their own daily activity goals.
3. Goal Completion Feedback: Displays progress, e.g., "You completed 8/9 today! Try a bit harder next time."

·Benefit: Encourages an active lifestyle by providing real-time activity feedback to motivate users.

·Stakeholders: Users

Epic 8: Wellness Center for Healthcare Resources

• Title: Educational Health Resources and Consultation recommendations
• Description: Provides users with access to reliable health information and professional consultation recommendations and wellness support, including:
1. Wellness Center: Educational content on hypertension and diabetes, including causes, symptoms, risk-increasing behaviors (e.g., smoking, inactivity), and related complications such as retinopathy, cardiovascular disease, and kidney issues.
2. Specialist Contacts: A directory of doctors for professional consultations.
3. Medical advice: In-app advisory services to offer general health guidance.
4. Doctor Recommendations: Users can view doctor recommendations with rating, location, and contact number.
5. Latest Health Improvements: Updates on recent developments in healthcare.
6. Recommended Recipes: Healthy and condition-friendly recipes to support chronic disease management.
• Benefit: Empowers users with accurate health knowledge and resources.
• Stakeholders: Users.

Epic 9: Agile Implementation with Scrum and XP

• Title: Agile Development Using Scrum and XP
• Description: The project follows agile methodologies to ensure continuous improvement, including:
1. Sprint Planning: Prioritizing features and tasks for each sprint.
2. Daily Standups: Tracking progress and addressing challenges.
3. Sprint Review: Demonstrating completed features and gathering feedback.
4. Sprint Retrospective: Evaluating performance and identifying improvements.
5. Extreme Programming (XP): Improving code quality through continuous testing and incremental development.
6. User Feedback Integration: Collecting real-time feedback to refine features.
7. Continuous Integration/Continuous Deployment (CI/CD): Ensuring smooth and frequent updates.
• Benefit: Ensures high-quality development, minimizes errors, and accelerates feature delivery.
• Stakeholders: End users.

3.5 Sprint

A **Sprint** is a fixed, time-boxed iteration in **Scrum** during which a team delivers a potentially shippable increment of a product. It is the **heartbeat** of Scrum, driving progress and enabling frequent feedback loops to align development with user needs and business goals. Typically lasts between 1 to 4 weeks, with 2 weeks being the most common.

3.6 Sprint Planning

Sprint Planning sets the tone for the entire Sprint, and a well-executed Sprint planning meeting can enhance productivity of the Scrum Team. The **goal** is to create a plan for the sprint and establish a clear sprint goal that aligns with the overall project objectives.

a. Sprint Goal: A brief explanation of what the team plans to achieve during the course of an agile sprint.

b. Key Inputs for Sprint Planning:

1) Product Backlog: List of prioritized features, enhancements, or fixes.

2) Team Velocity: Historical data showing how much work the team can typically handle in a sprint.

3) Sprint Duration: Timeframe (e.g., 1–2 weeks) defining the sprint.

4) Definition of Done: Agreed-upon criteria to ensure work is completed and meets quality standards.

5) Acceptance Criteria: Conditions that a product or feature must satisfy to be accepted by the product owner. It focuses on the user's expected needs

c. Sprint Backlog: A list of user stories and tasks for the sprint is created and broken down into actionable tasks, including the tasks to be completed within each sprint.

d. Progress Tracking: Time management is essential for the successful development of the Viva Vital app. Each phase of the project from planning to implementation had to be completed on time to ensure that critical features. [14]

1. Time Schedule: A calendar-style breakdown of deliverables and deadlines to manage Sprint focus and time constraints.

Task Name	Duration	Start	Finish
Planning	10 days	15/Mar/2025	24/Mar/2025
Requirements Gathering & System Analysis	20 days	20/Mar/2025	10/Apr/2025
Design	22 days	25/Mar/2025	15/Apr/2025
Programming Task Division & Assignment	7 days	28/Mar/2025	3/Apr/2025
Coding	40 days	4/Apr/2025	20/May/2025
Testing	15 days	10/May/2025	28/May/2025
Documentation	50 days	20/Mar/2025	28/May/2025

Table 3.1: Viva Vital Time Schedule

2. Gantt chart: A visual project management tool used to illustrate the project schedule, showing task dependencies, durations, and timelines.

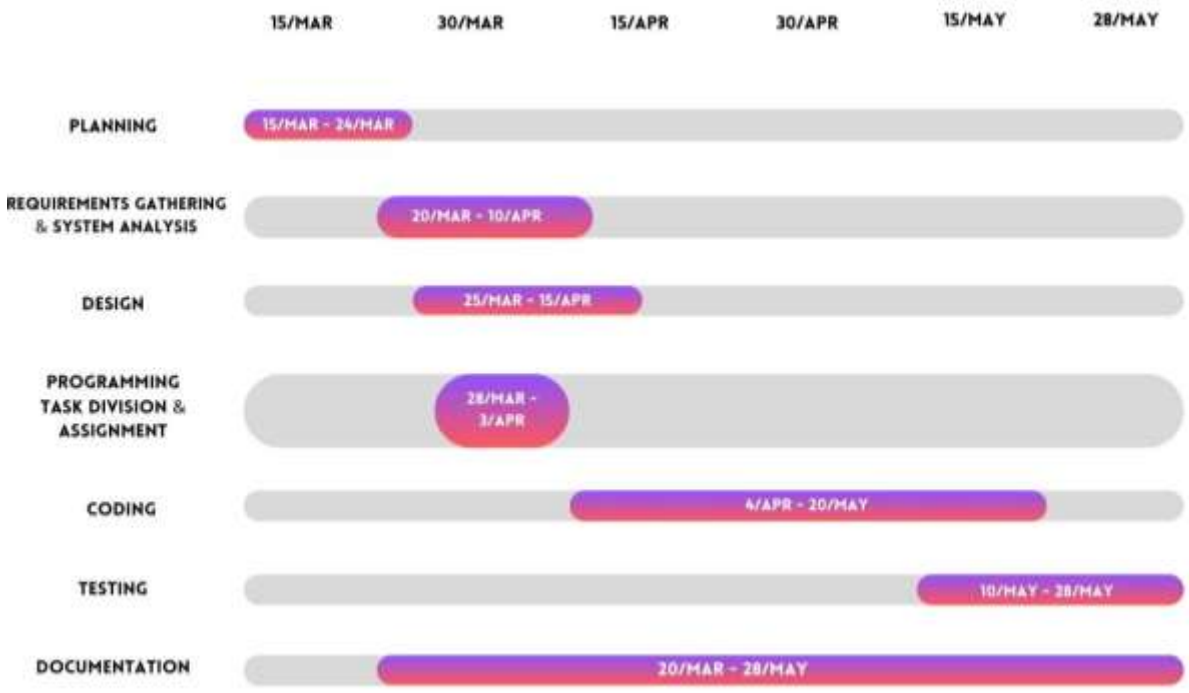


Figure 3.9: Viva Vital Gantt chart

3.7 User Stories

User stories are short, simple descriptions of a feature told from the perspective of the end user. They help the team understand what the user needs and why. A typical user story follows the format:

As a [type of user], I want to [perform some task] so that I can [achieve some goal].

Each user story should be:

- **Independent**
- **Negotiable**
- **Valuable**
- **Estimable**
- **Small**
- **Testable**

These qualities are called the **INVEST**. User stories become the basis of sprint planning and backlog prioritization, and are typically refined during backlog grooming sessions.

3.8 Product Backlog Refinement

Is the act of breaking down and further defining Product Backlog items into smaller more precise items. Refinement can occur at any time during a Sprint, in a more formal meeting or meetings, on an ongoing basis or as needed. Refinement is not mandatory, however it is a recommended practice to consider in order to increase transparency and make work items more precise.

3.9 User story Mapping

User story mapping is a visual exercise that helps product managers and development teams define the work that will create the most satisfying user experience. It can help gain a deeper understanding of customers and guide the team to better prioritize work. In user story mapping, we create a dynamic outline of a representative user's interactions with the product, evaluate which steps have the most benefit for the user, and prioritize what should be built next.

3.10 Daily Scrum

Daily scrum is a 15-minute Scrum meeting held on each day of a sprint. The purpose of the daily scrum is for the team to inspect and adapt its progress. As it helps set the context of work for the coming days work.

3.11 Sprint Review

A sprint review is a collaborative session held at the end of each sprint where the team showcases completed work, gathers stakeholder feedback, aligns with the product vision, celebrates achievements, and identifies improvements to update the product backlog and enhance future development.

3.12 Sprint Retrospective

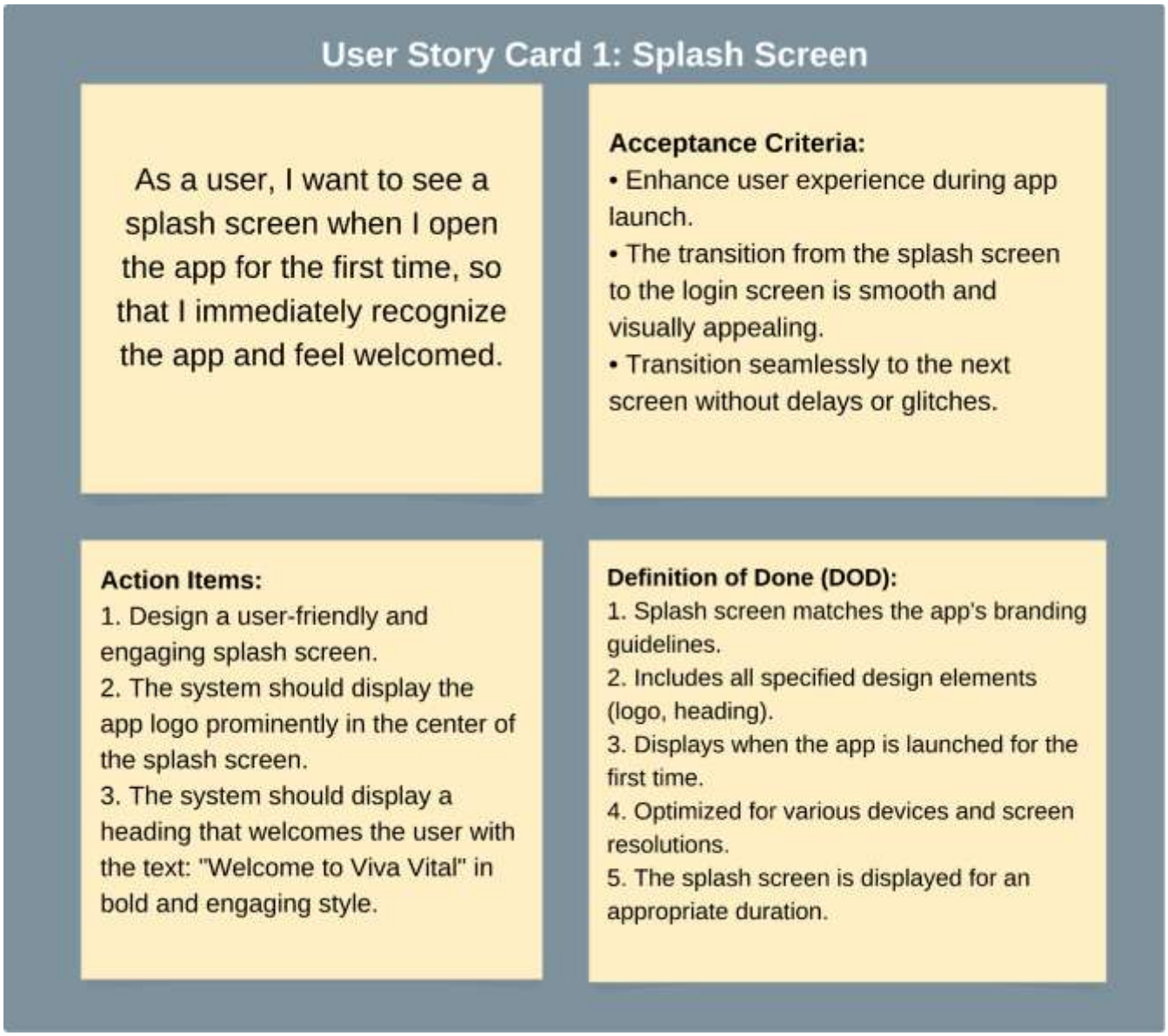
Sprint retrospective Brings scrum team together to discuss the previous sprint. The purpose is not to evaluate work outcomes but to talk about the interactions, tools, and processes the team used during the latest period of work Retrospectives are usually held at the end of each sprint. It helps teammates strive toward better collaboration. A retrospective is a chance for the scrum team to continuously improve, Inspect and adapt and grow as a team and as individuals.

Figure 3.10: Stakeholder Feedback during Sprint Review

3.13 Viva Vital Sprints

Sprint 1:

The goal of this sprint is to develop a secure and seamless user authentication system for both new and existing users, including a splash screen, login, sign-up and password recovery. These features aim to enhance the user experience, ensure security, and protect personal data, ultimately increasing user trust in the app.



User Story Card 2: User Account

As a new user, I want to create an account by providing my personal details, so that I can use the app and its features.

Acceptance Criteria:
- The system should validate user inputs (e.g., phone number format, national ID).
- User details like name, national SID number, phone number, gender, height, weight, and medical conditions should be entered.
- The password field should meet security standards.

Action Items:
1. Design the user account page with fields for the required personal information.
2. Implement validation for user inputs.
3. Design password field with security requirements

Definition of Done (DOD):
1. The page is fully functional and matches the app's design.
2. All user inputs are validated.
3. Password is stored securely

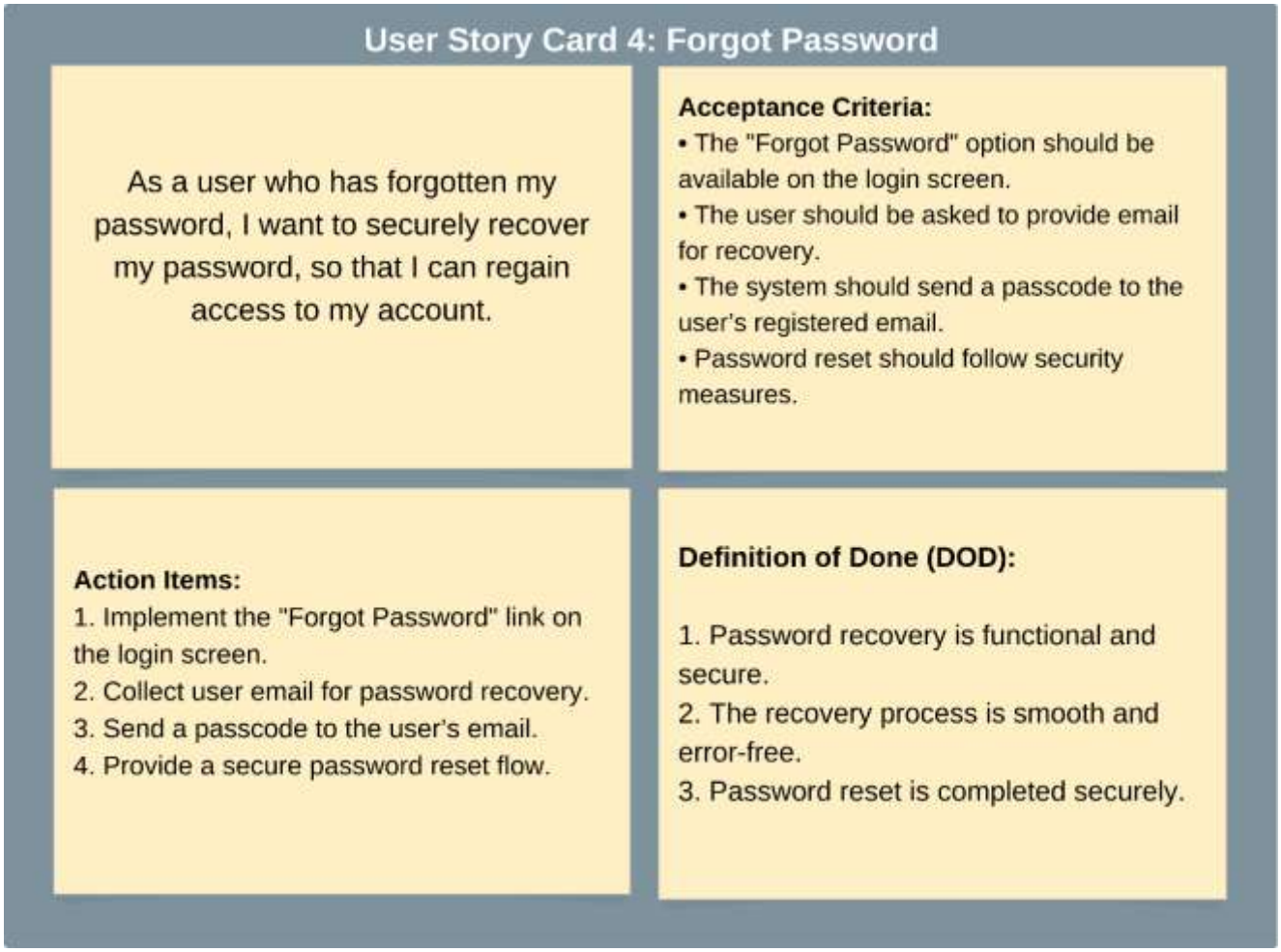
User Story Card 3: User Login

As a registered user, I want to securely log in using my credentials, so that I can access my account and use the app's features.

Acceptance Criteria:
- Ensure secure authentication of user credentials.
- The login page should have fields for username/email and password.
- An error message should be displayed for invalid login attempts.
- Successful login redirects to the main screen without errors.

Action Items:
1. Design and implement a user login page.
2. Validate user input for username/email and password.
3. Implement authentication logic for verifying user credentials securely.
4. Provide error messages for invalid credentials.
5. Redirect users to the main screen upon successful login.

Definition of Done (DOD):
1. The page is fully functional and matches the app's design.
2. All user inputs are validated.
3. Password is stored securely



Sprint 2:

The goal of this sprint is to implement a personalized health tracking and monitoring system that allows users to input, track, and receive reminders for key health metrics. This includes vital measurements, daily tracking, and HbA1C monitoring, medical appointment management. These features will empower users to proactively manage their health conditions.

User Story Card 1: Vital Measurements Tracking

As a user, I want to input and track my vital measurements (blood pressure, heart rate, oxygen level, glucose level, and respiratory rate), so that I can monitor my health status over time.

Acceptance Criteria:
- Users should be able to input and save their health metrics.
- The system should display historical trends for each measurement.
- Data should be stored securely and accessible for future reference.

Action Items:
1. Design and implement a UI for entering vital measurements.
2. Store input data securely in the database.
3. Display a graphical representation of health trends.

Definition of Done (DOD):
1. Users can successfully enter and view their measurements.
2. Data is saved and retrieved securely.
3. Graphs display trends for each health metric.

User Story Card 2: Daily Measurement Reminders

As a user, I want to receive reminders to check and log my daily health measurements, so that I can maintain a consistent health tracking routine.

Acceptance Criteria:
- Users can set reminders for different health metrics.
- Notifications should be timely and customizable.
- The system should log missed entries.

Action Items:
1. Implement a reminder scheduling system.
2. Enable users to customize the frequency of reminders.
3. Send push notifications based on user preferences.

Definition of Done (DOD):
1. Users can schedule and modify reminders.
2. Notifications are sent accurately.
3. The system logs missed or skipped measurements.

User Story Card 3: HBA1C (Diabetes Tracking)

As a diabetes patient, I want to track my HbA1C levels over time, so that I can monitor my diabetes management progress.

Acceptance Criteria:
· Users can input and save HbA1C readings.
· Users can enter time of each measurement.
· Users receive reminders for periodic HbA1C tests.
· System sends a reminder for the next scheduled HbA1C appointment.

Action Items:
1. Design a dedicated input section for HbA1C readings.
2. Store and retrieve historical HbA1C data.
3. Implement reminders for upcoming tests.

Definition of Done (DOD):

1. Users can log and track HbA1C readings.
2. Reminder notifications for future tests are functional.

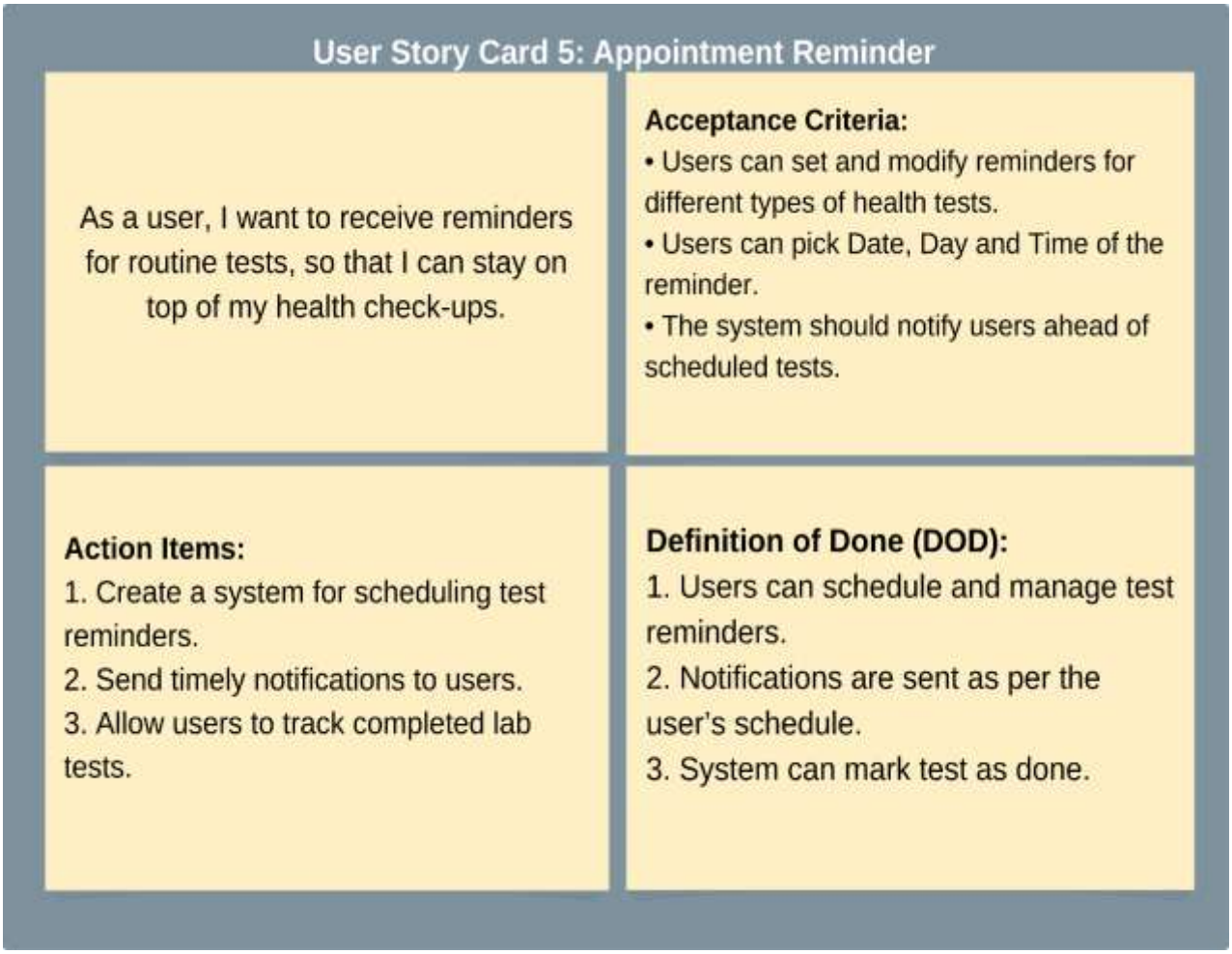
User Story Card 4: Medical Appointment Management

As a user, I want to schedule and receive reminders for medical appointments, so that I never miss an important check-up.

Acceptance Criteria:
·Users can schedule appointments within the app.
·The system sends reminders before the appointment.
· Users can modify or cancel appointments.

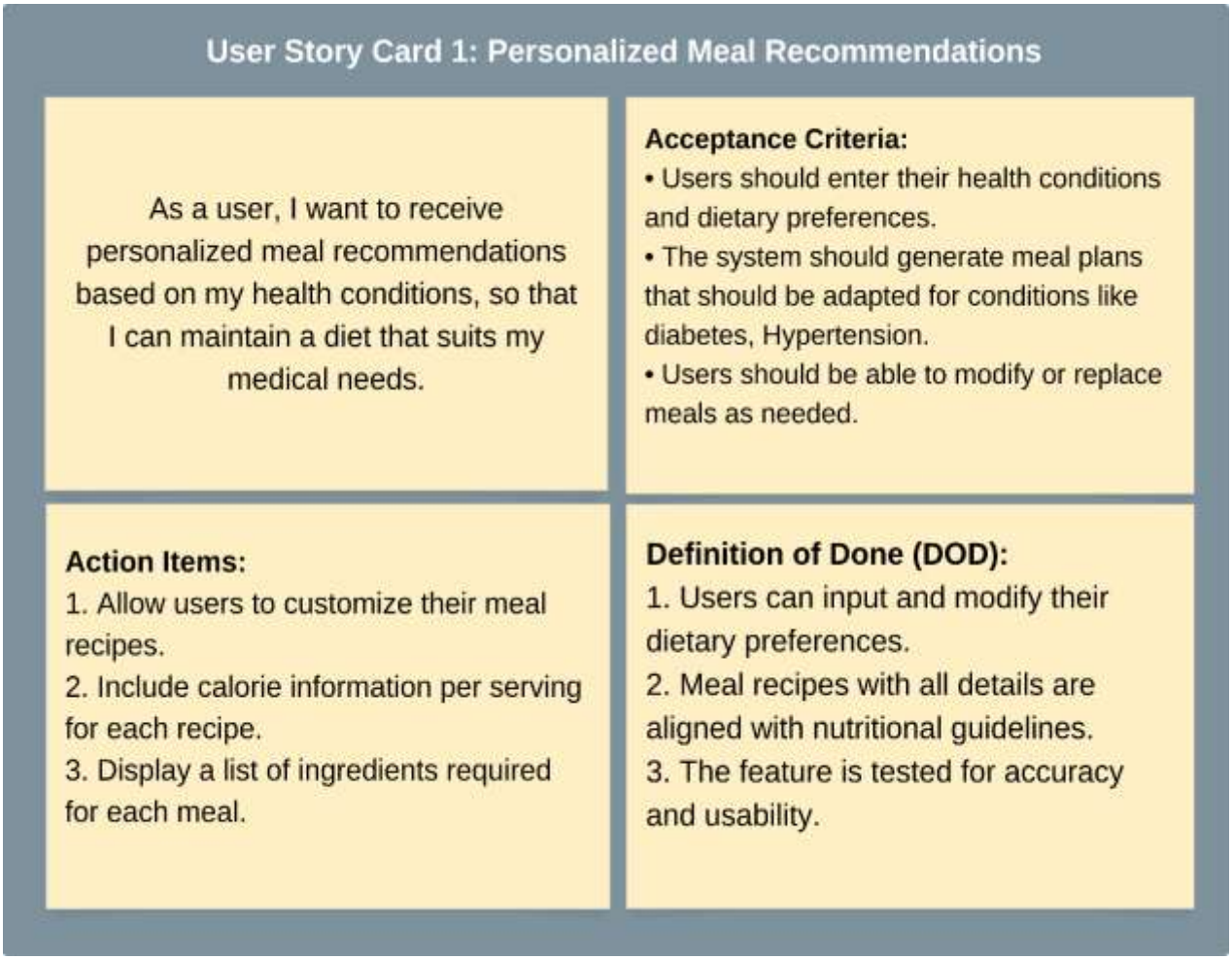
Action Items:
1. Implement an appointment scheduling feature.
2. Enable users to set reminders for upcoming visits.
3. Provide an option to edit or cancel appointments.

Definition of Done (DOD):
1. Users can schedule, modify, and cancel appointments.
2. Reminders are sent as per the selected schedule.
3. The system prevents overlapping appointments.



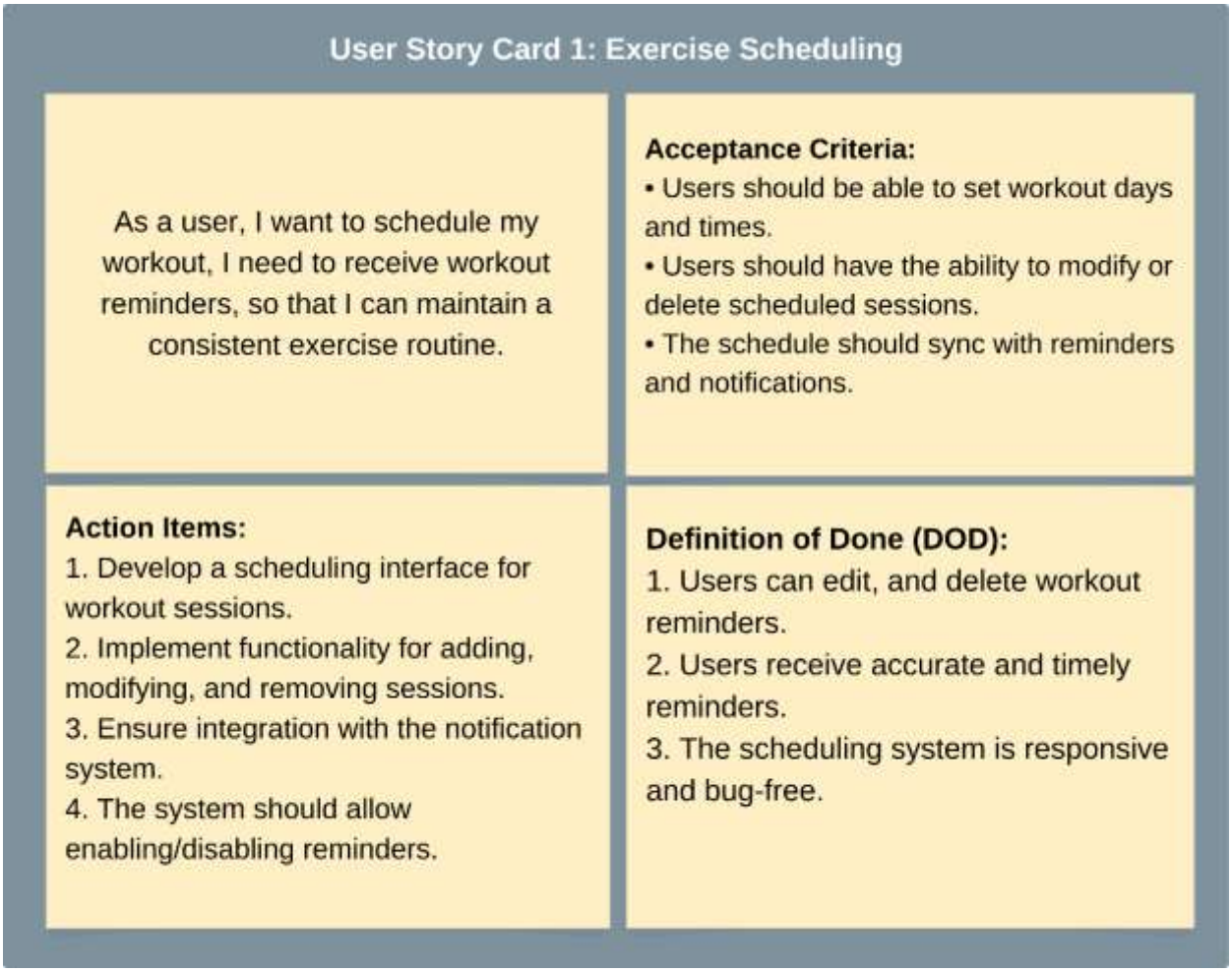
Sprint 3:

The goal of this sprint is to implement a personalized meal planning and nutrition support system that provides tailored diet recommendations based on users' health conditions. This includes healthy recipes, ingredients and calorie tracking per serving. These features will help users maintain a healthy diet and manage chronic condition.



Sprint 4:

The goal of this sprint is to develop a personalized fitness management system that helps users maintain a healthy and active lifestyle. This includes tailored workout plans, exercise scheduling, smartwatch and fitness tracker integration, workout reminders, and therapeutic exercises for patients with chronic conditions. These features aim to enhance user engagement, promote consistency, and improve overall well-being.



Sprint 5:

The goal of this sprint is to develop a comprehensive medication management system that enables users to schedule medications, receive reminders, track adherence, and get refill alerts. By implementing these features, the app ensures users stay on track with their treatments, reducing the risk of missed doses and improving overall health outcomes.

User Story Card 1: Medication Scheduling & Alerts

As a user, I want to log my prescribed medications along with dosage and intake frequency and receive an automated reminder so that I can easily follow my treatment plan.

Acceptance Criteria:
- Users can add medication names, dosages, and intake schedules.
- Users can specify frequency (e.g., daily, weekly, specific time of day).
- The system saves medication details securely.
- Users should receive notifications at the scheduled intake time.

Action Items:
1. Allow users to input medication details (name, dosage, frequency).
2. Implement a notification system for scheduled medications.
3. Display medication name and dosage in the alert.
4. Enable editing and deletion of scheduled medications.

Definition of Done (DOD):
1. Medication details can be added, updated, and removed.
2. Data is securely stored and retrieved from the database.
3. Notifications trigger at the correct scheduled times.
4. User interface is intuitive and easy to use.

User Story Card 2: Refill Notifications

As a user, I want to receive alerts when my medication is running low, so that I can refill my prescription on time.

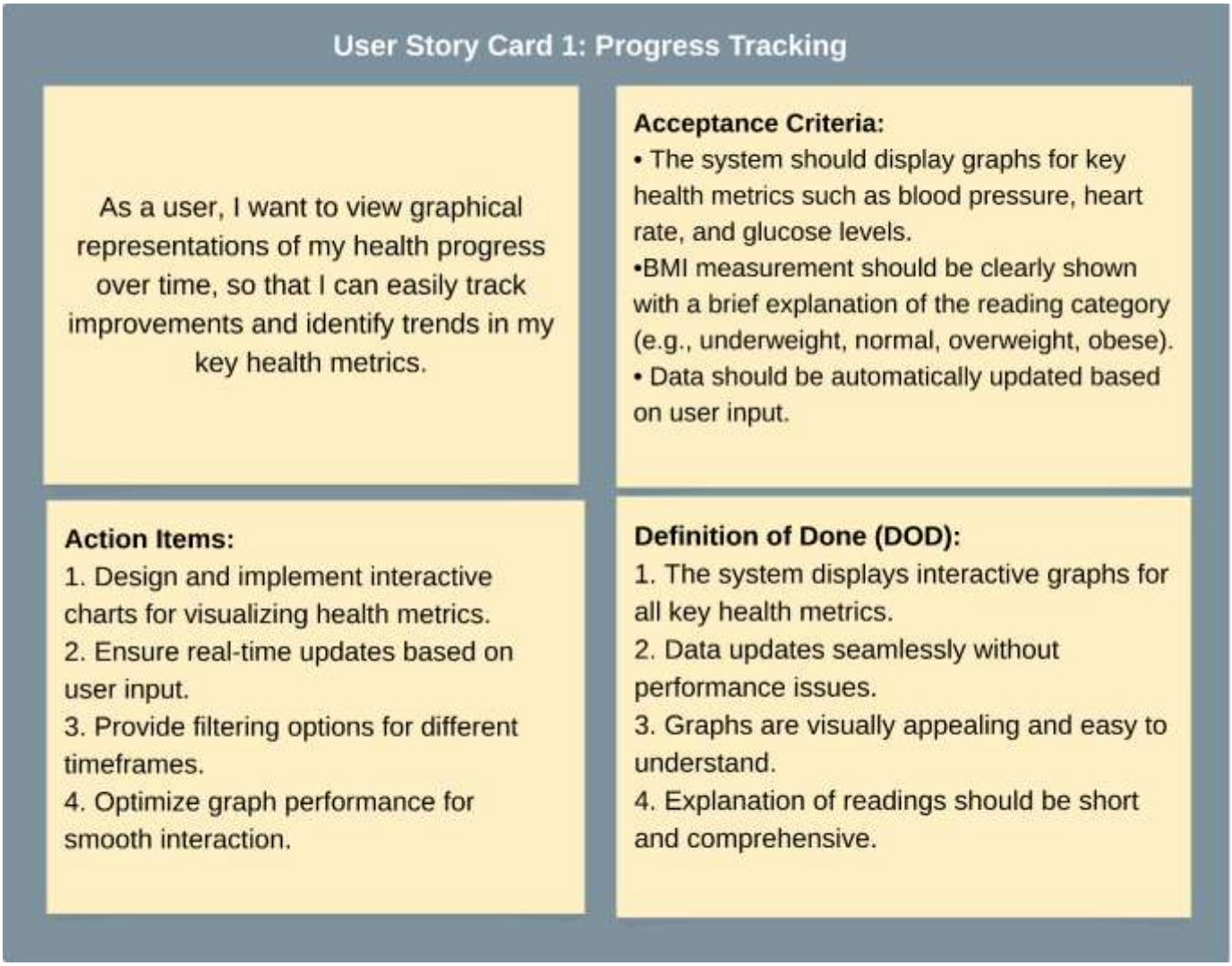
Acceptance Criteria:
- Users can set refill thresholds (e.g., alert when 5 pills remain).
- The system calculates when a medication is running low.
- A refill reminder is sent to the user before medication runs out.

Action Item:
1. Implement a system for tracking remaining medication supply.
2. Allow users to set refill reminder thresholds.
3. Send notifications when medication is low.

Definition of Done (DOD):
1. Users can configure refill reminders.
2. Alerts are sent before medication runs out.
3. The feature functions accurately based on intake frequency.

Sprint 6:

The goal of this sprint is to develop an interactive health progress tracking system that allows users to monitor their key health metrics through visual trends, analyze the impact of their diet and exercise, set personal health goals, and generate comprehensive reports. Additionally, gamification features will be introduced to enhance user engagement and motivation.



Sprint 7:

This sprint aims to provide users with reliable health information through a Wellness Center and specialist directory. It includes educational content on hypertension and diabetes, their risks, complications, and prevention tips. Users can access home remedies, healthy recipe recommendations, doctor recommendations with contact details, and in-app medical advice, along with updates on the latest health improvements.

User Story Card 1: Wellness Center (Health Insights)

As a user, I want access to educational content about chronic diseases and nutrition, so that I can learn how to manage my health effectively.

Acceptance Criteria:
- Users can browse articles, animations, and photos about chronic diseases.
- Users can easily access the latest health insights and updates.
- The system ensures that all information is sourced from reliable medical organizations.

Action Items:
1. Design and implement a user-friendly interface for the Wellness Center.
2. Add categorized educational content on chronic diseases.
3. Create dedicated Sections (e.g., Deadly trio, Health Info).
4. Ensure all content is sourced from verified medical organizations.

Definition of Done (DOD):
- The interface is visually appealing, responsive, and user-friendly.
- Content is regularly updated and sourced from verified resources.
- Educational content is categorized clearly (e.g., Deadly Trio, Health Info).
- Users can view multimedia content (articles, animations, photos) without errors.
- All links, navigation, and contact information for specialists are functional.

User Story Card 2: Wellness Center (Recommendations)

As a user, I want to receive personalized exercise and recipe recommendations, along with homemade remedies, so that I can better manage my health and lifestyle.

Acceptance Criteria:
- Users can view exercise suggestions tailored to their condition.
- Users can view healthy recipe suggestions.
- Users can browse a list of safe, homemade remedies for managing symptoms.
- Recommendations are categorized and easy to filter by health condition.
- All content is medically sourced.

Action Items:
1. Add a library of exercises categorized by condition and difficulty.
2. Upload healthy recipes with clear ingredient lists and calorie info.
3. Curate safe homemade remedies backed by medical sources.
4. Implement filters for condition-based content (e.g., diabetes, hypertension).

Definition of Done (DoD):
- Recommendations for exercises, recipes, and remedies are accessible in the app.
- All content is visually clear, responsive, and organized by category.
- Exercises and recipes are described clearly and matched to health needs.
- Homemade remedies are simple, safe, and based on credible sources.

User Story Card 3: Wellness Center (Consultants & communities)

As a user, I want to access a list of recommended medical consultants and supportive communities, so I can connect with professionals and people who understand my health journey.

Acceptance Criteria:
- Users can view a directory of consultants with name, specialty, location, contact number, and recommendation rating.
- Users can browse supportive communities with descriptions and contact options.
- All profiles and communities are medically verified or recommended by trusted sources.

Action Items:
- Design and implement a dedicated section for consultants and communities.
- Add doctor profiles with name, specialty, contact, location, and rating.
- List trusted supportive communities with info and access links.
- Ensure information is verified and up-to-date.

Definition of Done (DOD)
- A dedicated, accessible section for consultants and communities is available in the app.
- UI is responsive and user-friendly.
- All links and contacts are functional and tested.
- Content is reviewed and validated by trusted medical organizations or professionals.

Chapter 4: Design Phase

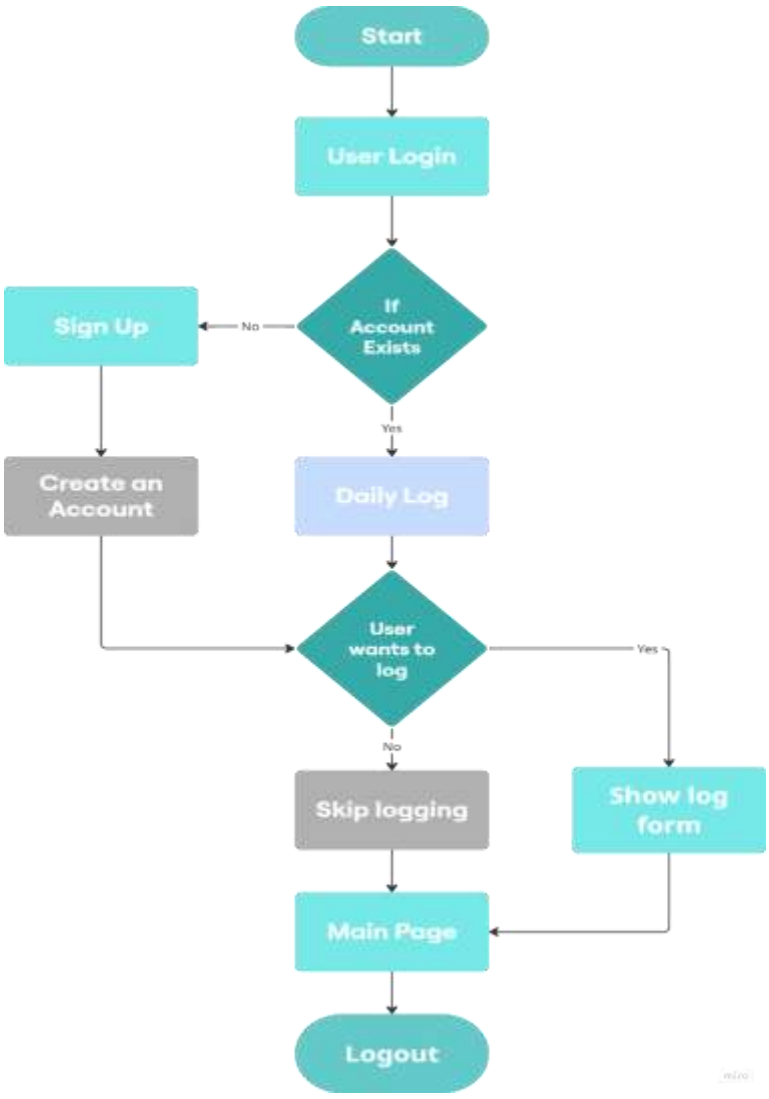
4.1 Introduction to Design Phase

During the Design Phase, the system is designed to satisfy the requirements identified in the previous phases. The requirements identified in the Requirements Analysis Phase are transformed into a System Design Document that accurately describes the design of the system and that can be used as an input to system development in the next phase. Once the design is approved, the Development Team begins the Implementation Phase.

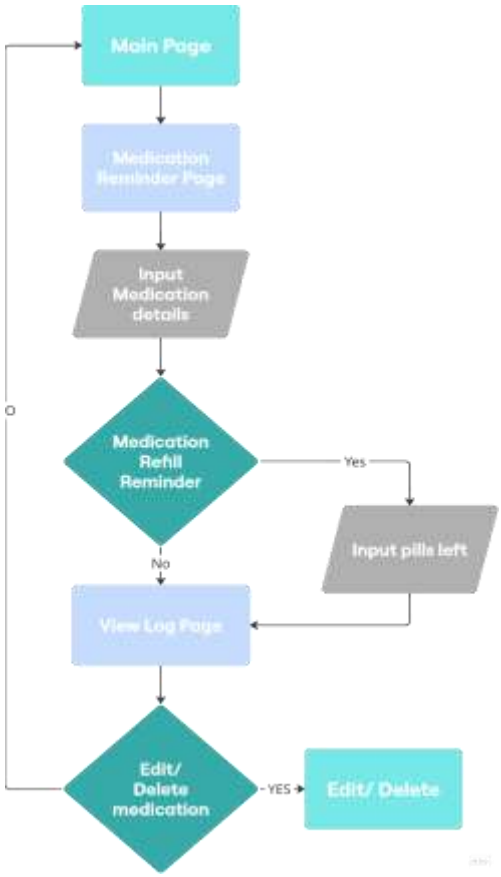
4.2 Flowchart

The following figures present the primary Viva Vital flowcharts, created using Miro.[15]

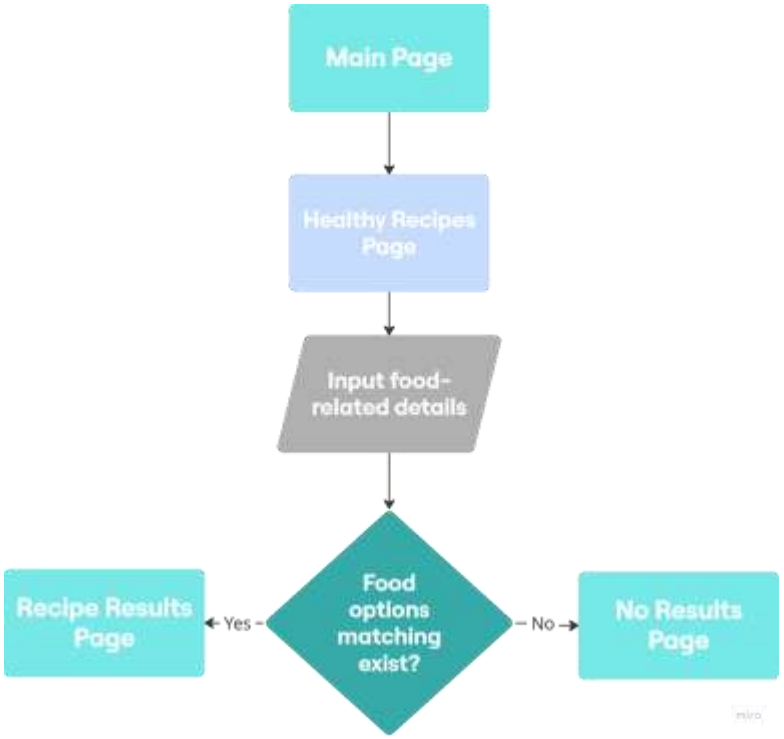
4.2.1 Login/Sign-Up flowchart



4.2.2 Medication Reminder Page Flowchart

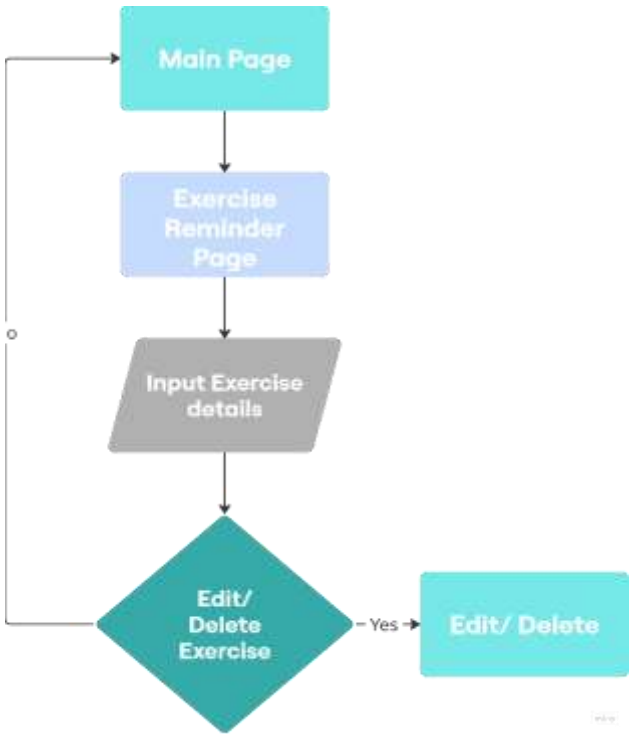


4.2.3 Healthy Recipes Page Flowchart



4.2.4 Health Status Flowchart

4.2.5 Fitness Flowchart



4.3 Database Function in Scrum and XP Methodology

The database in our project serves as the backbone for storing and managing various data related to users and health activities. It comprises several interrelated tables designed to ensure data accuracy, consistency, and optimal performance, supporting various application functionalities.

Key tables include:

- **user_account**: Stores basic user information such as name, password, and email.
- **user_profile**: Contains detailed profile information linked to the user_account, facilitating personalized user experiences.
- **activity_results**: Records daily activities accomplished by users, encompassing exercise routines and healthy nutrition practices.
- **appointment_reminder.**
- **exercise_reminder.**
- **medication_reminders.**
- **hba1c**: Monitors Hemoglobin A1c levels for long-term glucose control.
- **daily_status:** Captures users' daily emotional and physical well-being. It facilitates the monitoring of mood patterns, symptom progression, and other personal notes
- **vital_measurements** and **daily_measurements**: Track essential health metrics and daily health indicators, respectively.

- **about_us**: Contains static information about the application.

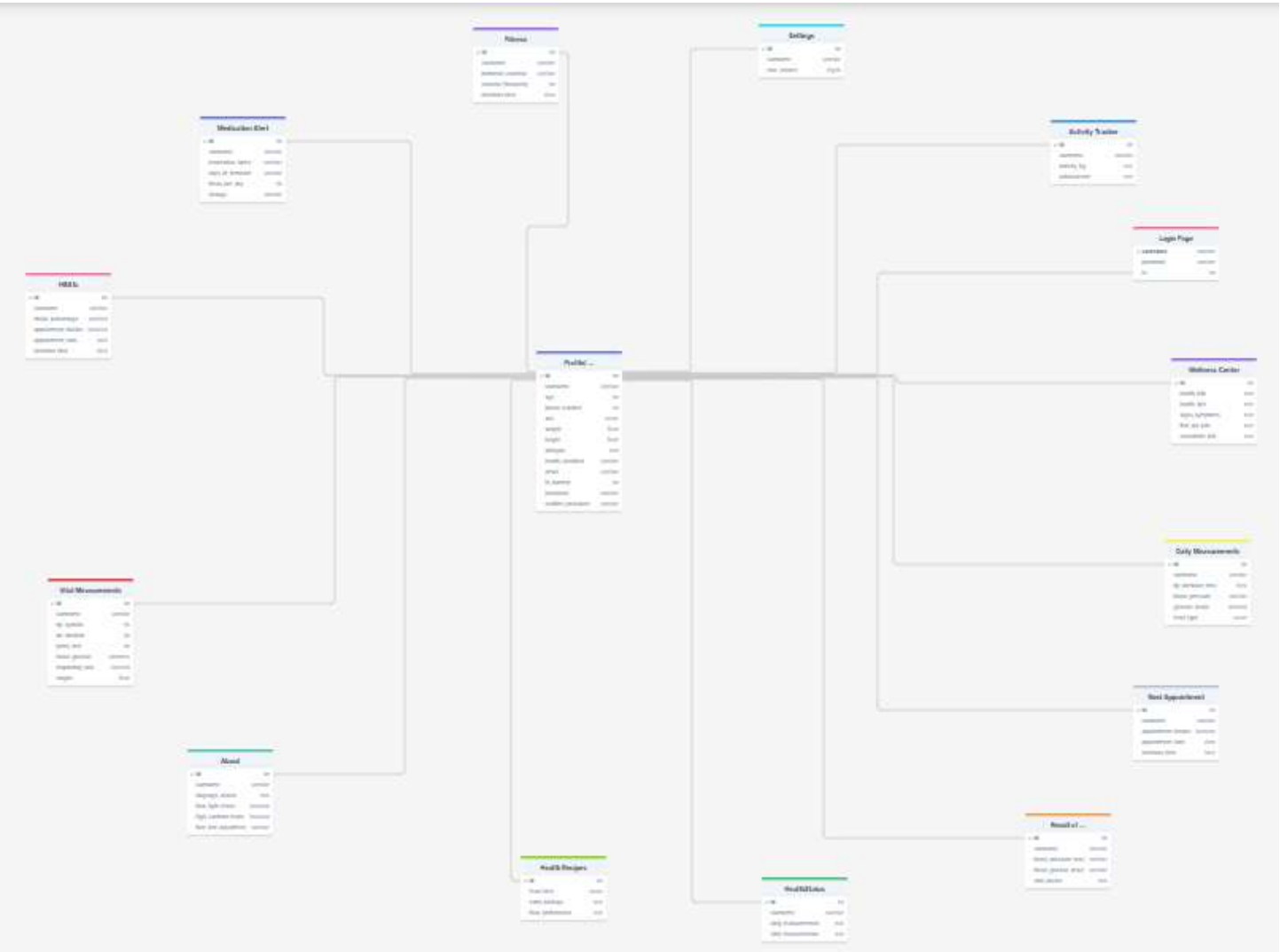
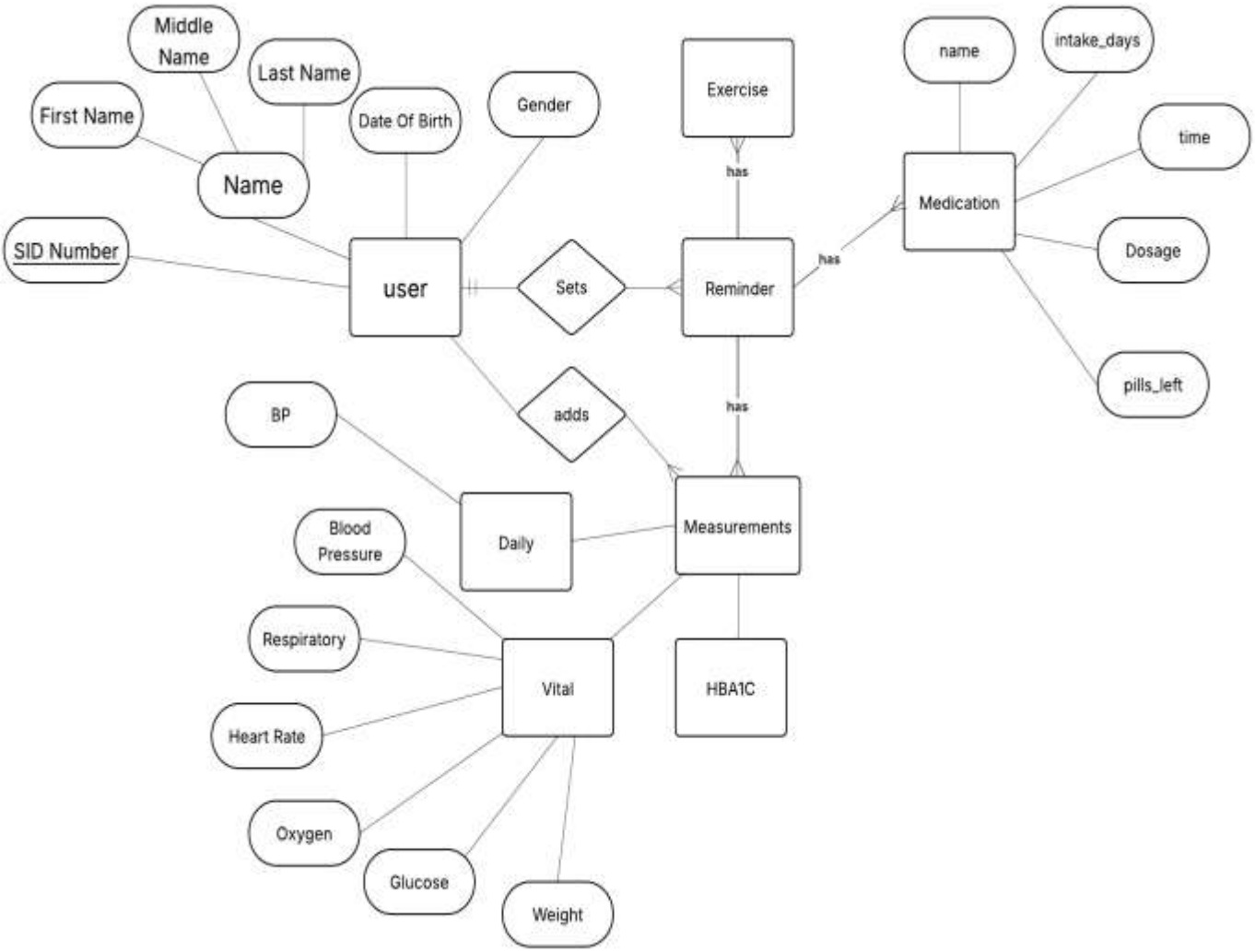


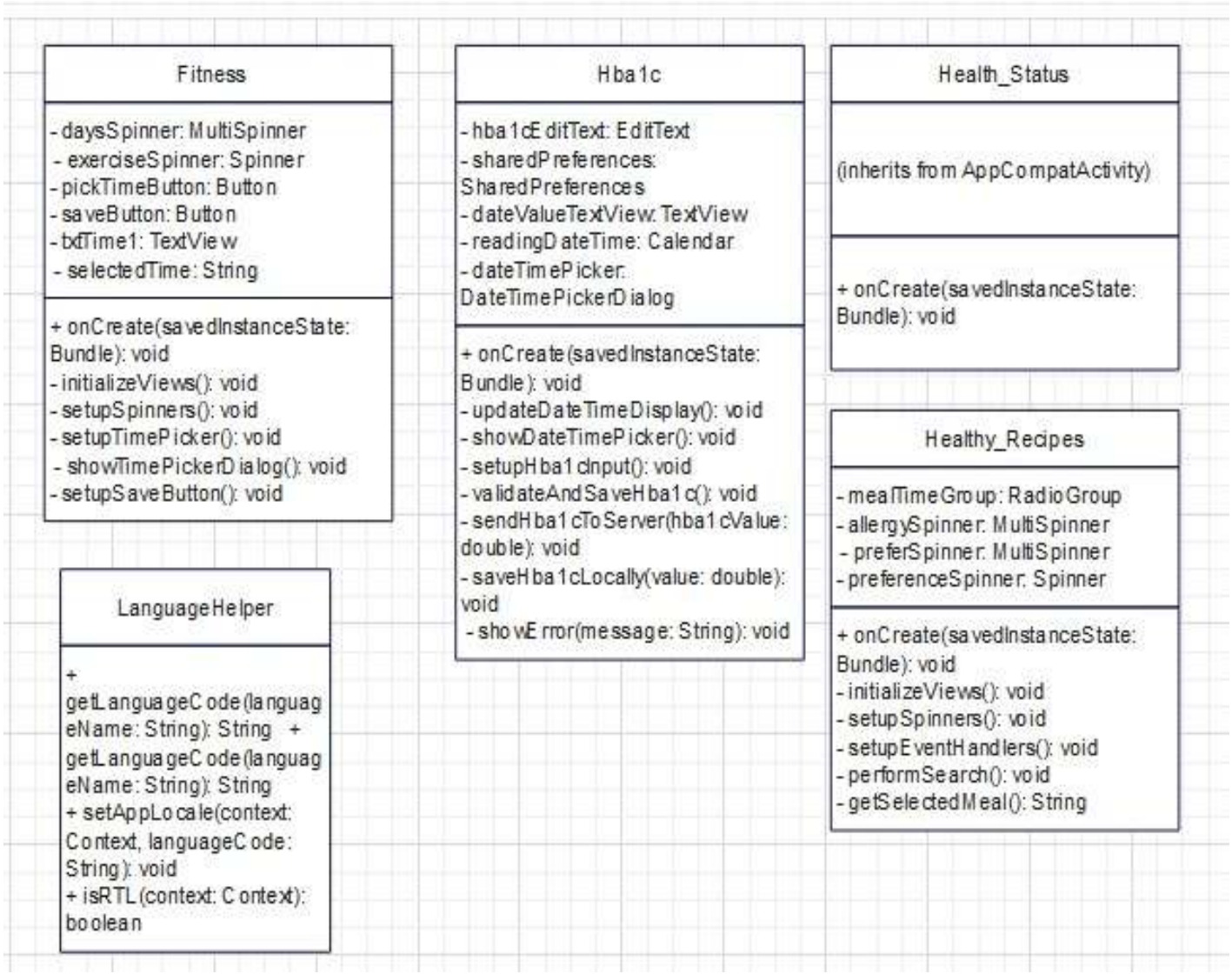
Figure 4.1: Database tables

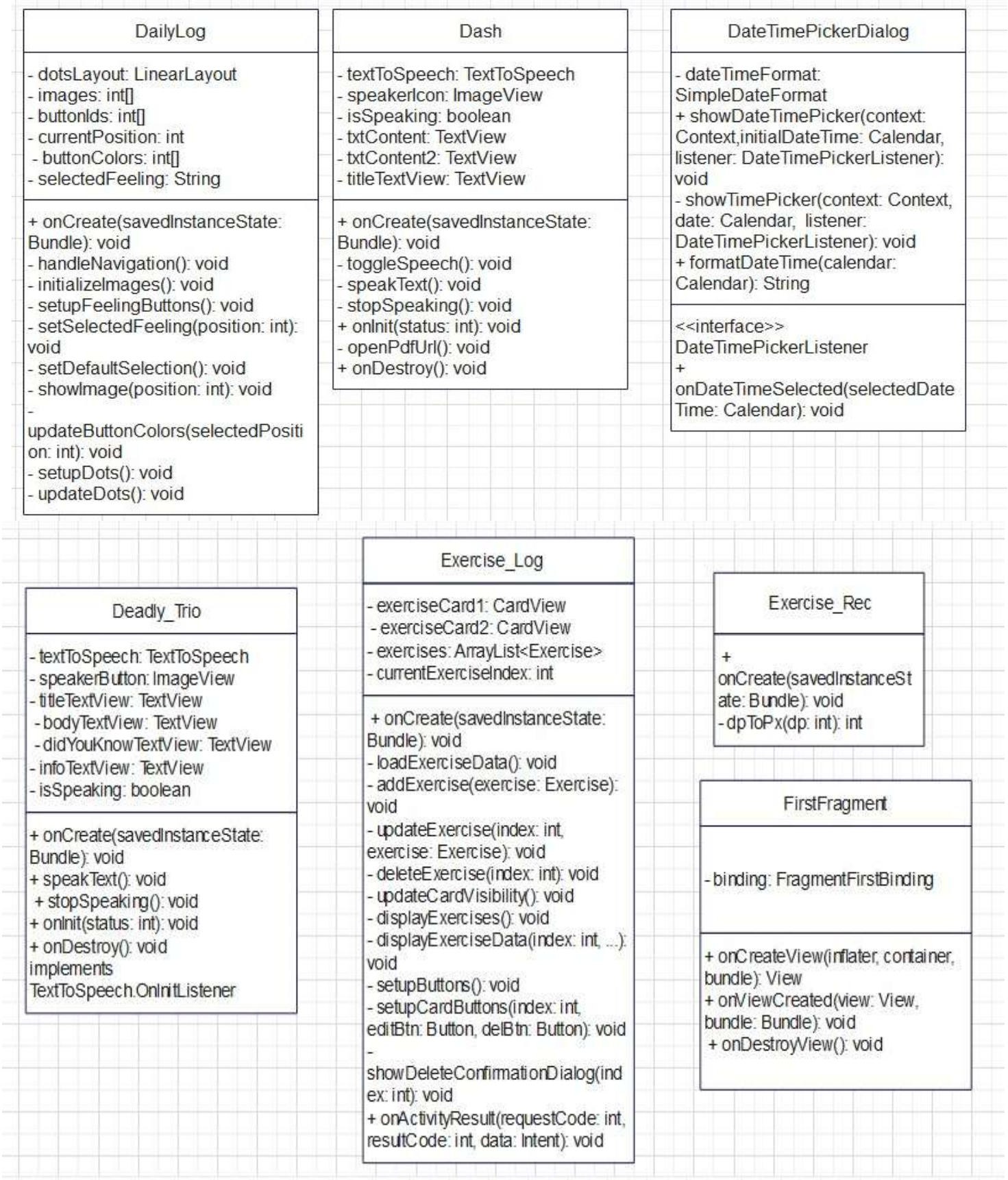
4.4 Enhanced Entity Relationship Model (EERM)

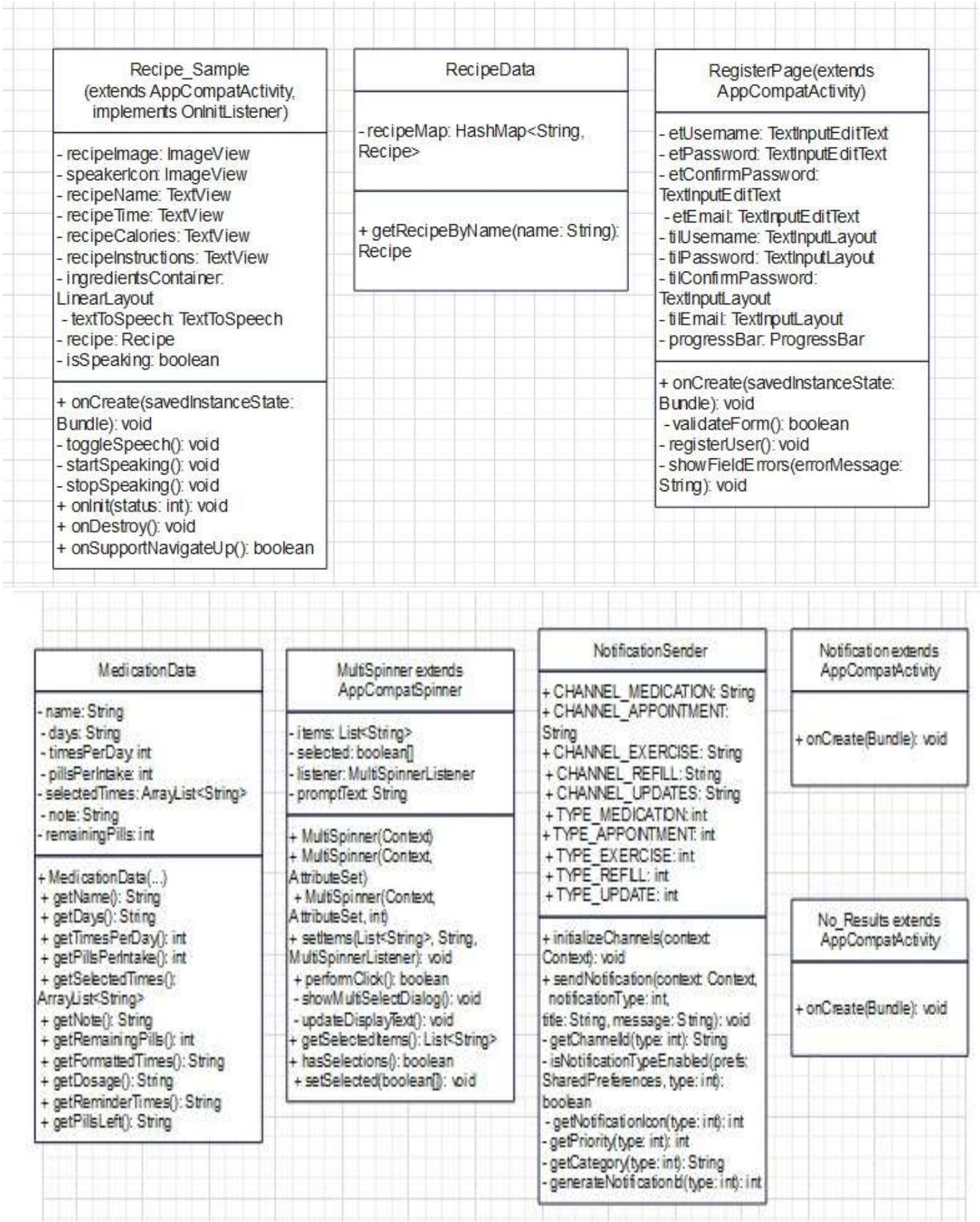


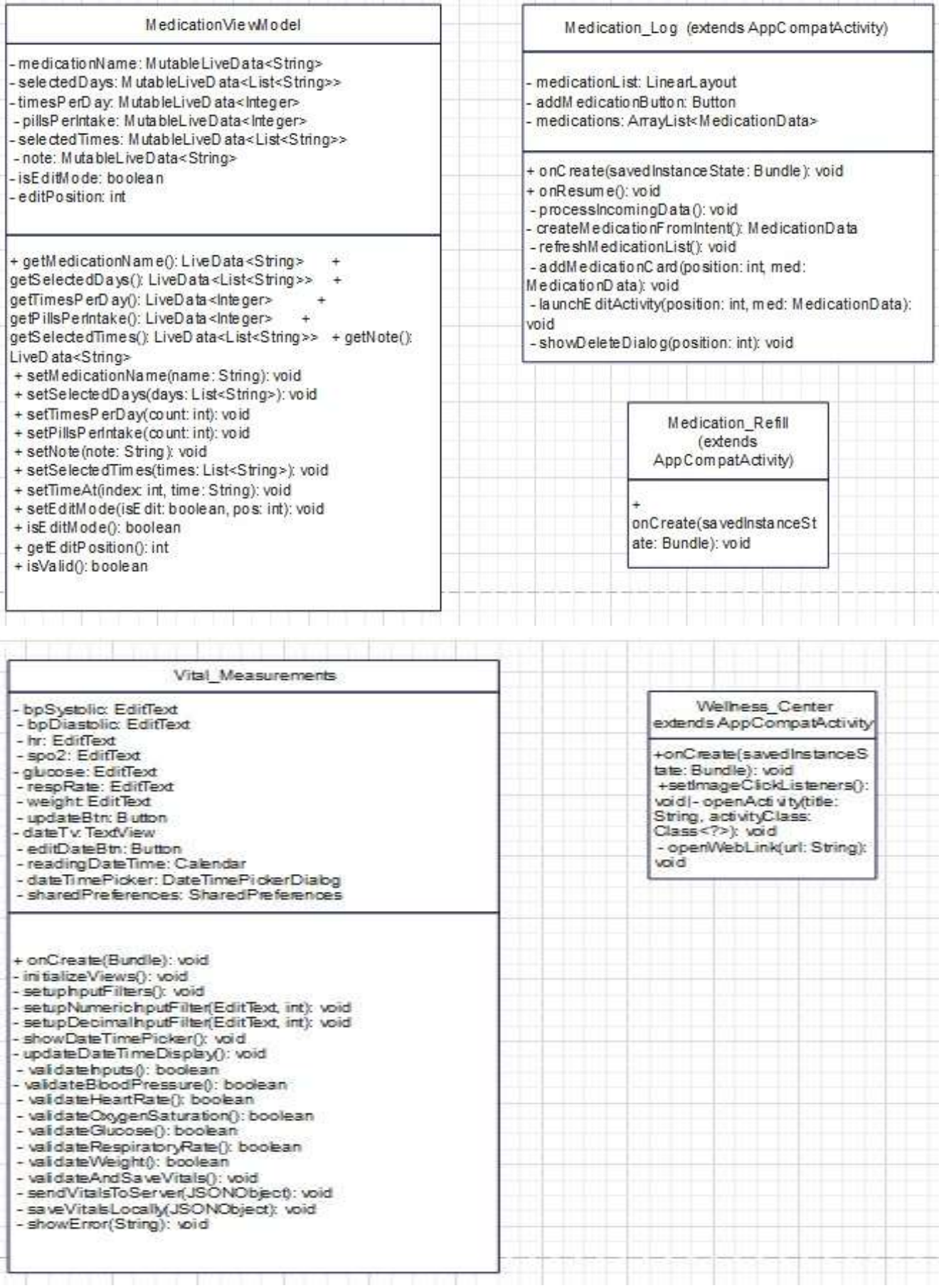
4.5 Class Diagram

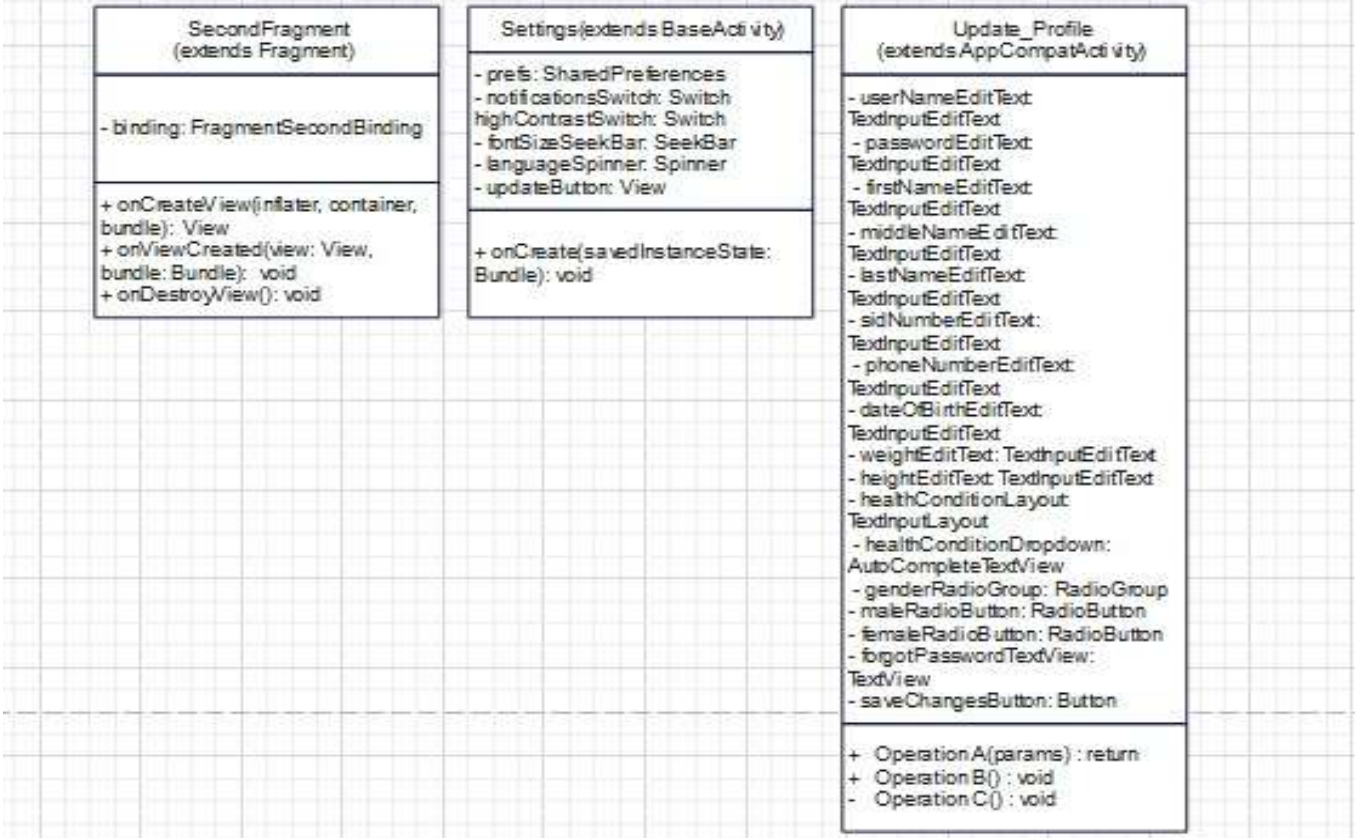
The figures below illustrate class diagram of Viva Vital. [2]

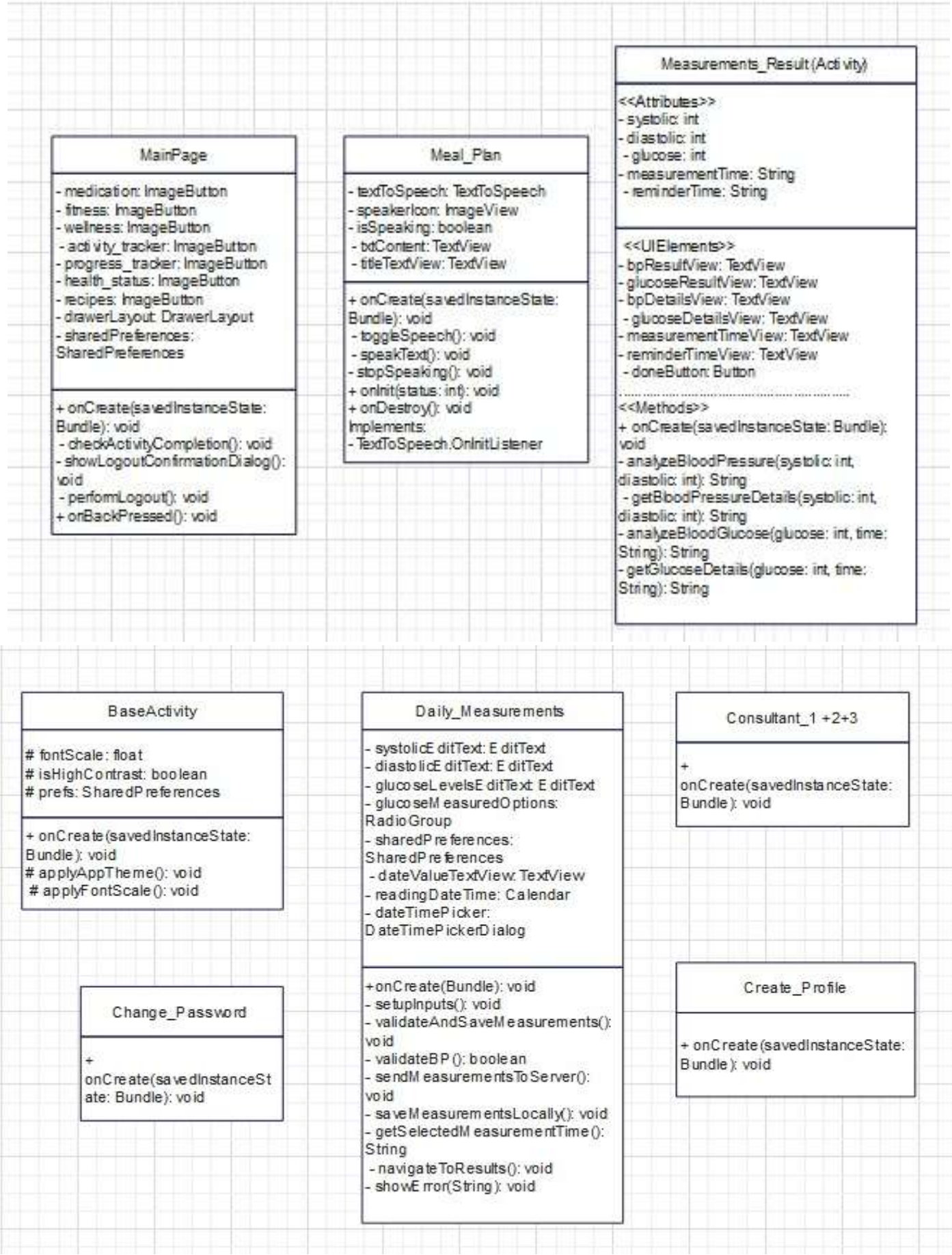


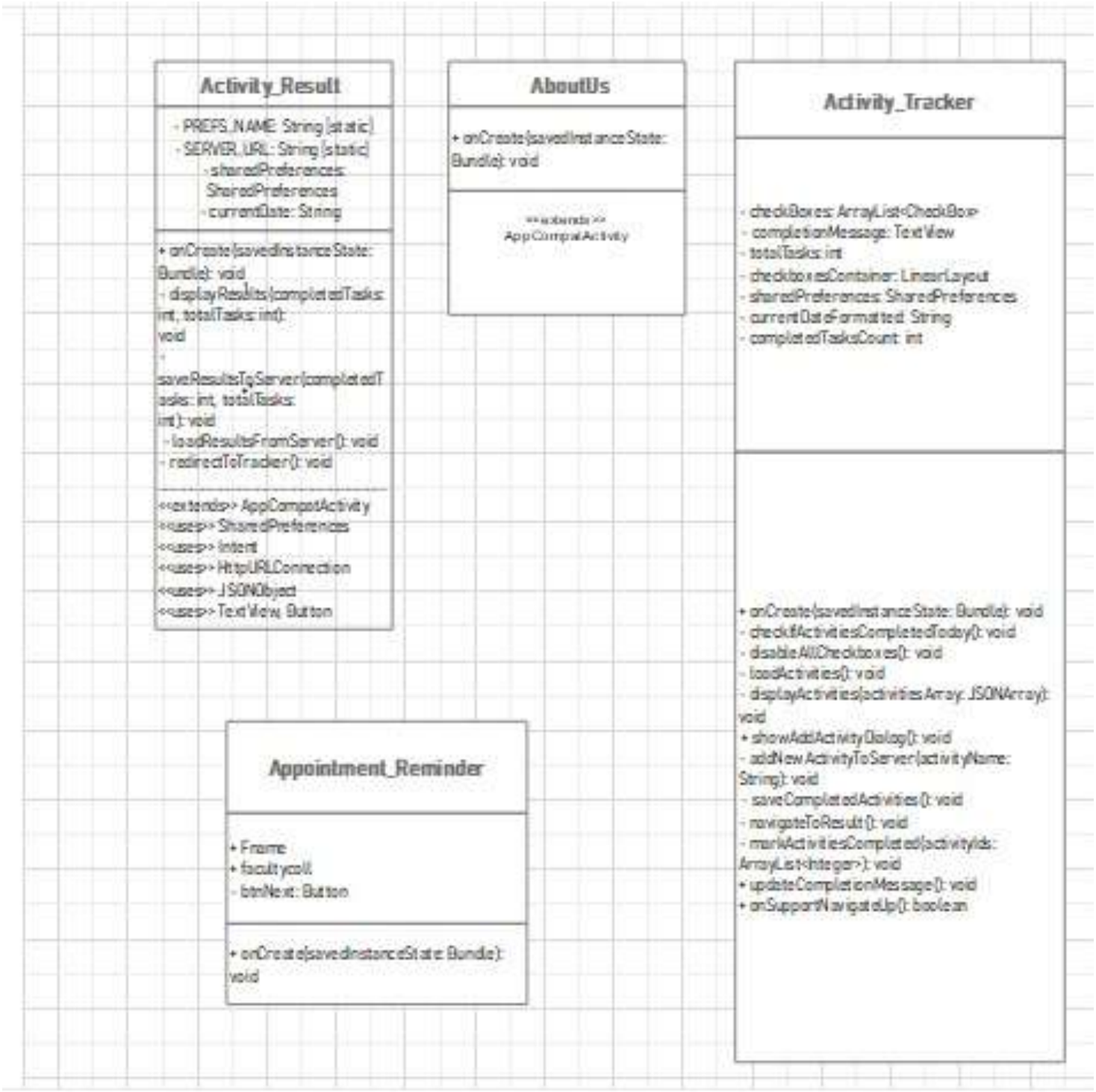

DailyLog
- dotsLayout: LinearLayout
- images: int[]
- buttonIds: int[]
- currentPosition: int
- buttonColors: int[]
- selectedFeeling: String
+ onCreate(savedInstanceState: Bundle): void
- handleNavigation(): void
- initializeImages(): void
- setupFeelingButtons(): void
- setSelectedFeeling(position: int): void
- setDefaultSelection(): void
- showImage(position: int): void
- updateButtonColors(selectedPosition: int): void
- setupDots(): void
- updateDots(): void
Dash
- textToSpeech: TextToSpeech
- speakerIcon: ImageView
- isSpeaking: boolean
- txtContent: TextView
- txtContent2: TextView
- titleTextView: TextView
+ onCreate(savedInstanceState: Bundle): void
- toggleSpeech(): void
- speakText(): void
- stopSpeaking(): void
+ onInit(status: int): void
- openPdfUrl(): void
+ onDestroy(): void
DateTimePickerDialog
- dateTimeFormat: SimpleDateFormat
+ showDateTimePicker(context: Context,initialDateTime: Calendar, listener: DateTimePickerListener): void
- showTimePicker(context: Context, date: Calendar, listener: DateTimePickerListener): void
+ formatDateTime(calendar: Calendar): String
<<interface>>
DateTimePickerListener
+ onDateTimeSelected(selectedDateTime: Calendar): void
Deadly_Trio
- textToSpeech: TextToSpeech
- speakerButton: ImageView
- titleTextView: TextView
- bodyTextView: TextView
- didYouKnowTextView: TextView
- infoTextView: TextView
- isSpeaking: boolean
+ onCreate(savedInstanceState: Bundle): void
+ speakText(): void
+ stopSpeaking(): void
+ onInit(status: int): void
+ onDestroy(): void
implements TextToSpeech.OnInitListener
Exercise_Log
- exerciseCard1: CardView
- exerciseCard2: CardView
- exercises: ArrayList<Exercise>
- currentExerciseIndex: int
+ onCreate(savedInstanceState: Bundle): void
- loadExerciseData(): void
- addExercise(exercise: Exercise): void
- updateExercise(index: int, exercise: Exercise): void
- deleteExercise(index: int): void
- updateCardVisibility(): void
- displayExercises(): void
- displayExerciseData(index: int, ...): void
- setupButtons(): void
- setupCardButtons(index: int, editBtn: Button, delBtn: Button): void
- showDeleteConfirmationDialog(index: int): void
+ onActivityResult(requestCode: int, resultCode: int, data: Intent): void
Exercise_Rec
+ onCreate(savedInstanceState: Bundle): void
- dpToPx(dp: int): int
FirstFragment
- binding: FragmentFirstBinding
+ onCreateView(inflater, container, bundle): View
+ onViewCreated(view: View, bundle: Bundle): void
+ onDestroyView(): void


Recipe_Sample
(extends AppCompatActivity,
implements OnInitListener)
- recipeImage: ImageView
- speakerIcon: ImageView
- recipeName: TextView
- recipeTime: TextView
- recipeCalories: TextView
- recipeInstructions: TextView
- ingredientsContainer:
LinearLayout
- textToSpeech: TextToSpeech
- recipe: Recipe
- isSpeaking: boolean
+ onCreate(savedInstanceState:
Bundle): void
- toggleSpeech(): void
- startSpeaking(): void
- stopSpeaking(): void
+ onInit(status: int): void
+ onDestroy(): void
+ onSupportNavigateUp(): boolean
RecipeData
- recipeMap: HashMap<String,
Recipe>
+ getRecipeByName(name: String):
Recipe
RegisterPage(extends
AppCompatActivity)
- etUsername: TextInputEditText
- etPassword: TextInputEditText
- etConfirmPassword:
TextInputEditText
- etEmail: TextInputEditText
- tilUsername: TextInputLayout
- tilPassword: TextInputLayout
- tilConfirmPassword:
TextInputLayout
- tilEmail: TextInputLayout
- progressBar: ProgressBar
+ onCreate(savedInstanceState:
Bundle): void
- validateForm(): boolean
- registerUser(): void
- showFieldErrors(errorMessage:
String): void
MedicationData
- name: String
- days: String
- timesPerDay: int
- pillsPerIntake: int
- selectedTimes: ArrayList<String>
- note: String
- remainingPills: int
+ MedicationData(...)
+ getName(): String
+ getDays(): String
+ getTimesPerDay(): int
+ getPillsPerIntake(): int
+ getSelectedTimes():
ArrayList<String>
+ getNote(): String
+ getRemainingPills(): int
+ getFormattedTimes(): String
+ getDosage(): String
+ getReminderTimes(): String
+ getPillsLeft(): String
MultiSpinner extends
AppCompatSpinner
- items: List<String>
- selected: boolean[]
- listener: MultiSpinnerListener
- promptText: String
+ MultiSpinner(Context)
+ MultiSpinner(Context,
AttributeSet)
+ MultiSpinner(Context,
AttributeSet, int)
+ setItems(List<String>, String,
MultiSpinnerListener): void
+ performClick(): boolean
- showMultiSelectDialog(): void
- updateDisplayText(): void
+ getSelectedItems(): List<String>
+ hasSelections(): boolean
+ setSelected(boolean[]): void
NotificationSender
+ CHANNEL_MEDICATION: String
+ CHANNEL_APPOINTMENT:
String
+ CHANNEL_EXERCISE: String
+ CHANNEL_REFILL: String
+ CHANNEL_UPDATES: String
+ TYPE_MEDICATION: int
+ TYPE_APPOINTMENT: int
+ TYPE_EXERCISE: int
+ TYPE_REFILL: int
+ TYPE_UPDATE: int
+ initializeChannels(context:
Context): void
+ sendNotification(context: Context,
notificationType: int,
title: String, message: String): void
- getChannelId(type: int): String
- isNotificationTypeEnabled(prefs:
SharedPreferences, type: int):
boolean
- getNotificationIcon(type: int): int
- getPriority(type: int): int
- getCategory(type: int): String
- generateNotificationId(type: int): int
Notification extends
AppCompatActivity
+ onCreate(Bundle): void
No_Results extends
AppCompatActivity
+ onCreate(Bundle): void


MedicationViewModel
- medicationName: MutableLiveData<String>
- selectedDays: MutableLiveData<List<String>>
- timesPerDay: MutableLiveData<Integer>
- pillsPerIntake: MutableLiveData<Integer>
- selectedTimes: MutableLiveData<List<String>>
- note: MutableLiveData<String>
- isEditMode: boolean
- editPosition: int
+ getMedicationName(): LiveData<String> + getSelectedDays(): LiveData<List<String>> + getTimesPerDay(): LiveData<Integer> + getPillsPerIntake(): LiveData<Integer> + getSelectedTimes(): LiveData<List<String>> + getNote(): LiveData<String>
+ setMedicationName(name: String): void
+ setSelectedDays(days: List<String>): void
+ setTimesPerDay(count: int): void
+ setPillsPerIntake(count: int): void
+ setNote(note: String): void
+ setSelectedTimes(times: List<String>): void
+ setTimeAt(index: int, time: String): void
+ setEditMode(isEdit: boolean, pos: int): void
+ isEditMode(): boolean
+ getEditPosition(): int
+ isValid(): boolean
Medication_Log (extends AppCompatActivity)
- medicationList: LinearLayout
- addMedicationButton: Button
- medications: ArrayList<MedicationData>
+ onCreate(savedInstanceState: Bundle): void
+ onResume(): void
- processIncomingData(): void
- createMedicationFromIntent(): MedicationData
- refreshMedicationList(): void
- addMedicationCard(position: int, med: MedicationData): void
- launchEditActivity(position: int, med: MedicationData): void
- showDeleteDialog(position: int): void
Medication_Refill (extends AppCompatActivity)
+ onCreate(savedInstanceState: Bundle): void
Vital_Measurements
- bpSystolic: EditText
- bpDiastolic: EditText
- hr: EditText
- spo2: EditText
- glucose: EditText
- respRate: EditText
- weight: EditText
- updateBtn: Button
- dateTv: TextView
- editDateBtn: Button
- readingDateTime: Calendar
- dateTimePicker: DateTimePickerDialog
- sharedPreferences: SharedPreferences
+ onCreate(Bundle): void
- initializeViews(): void
- setupInputFilters(): void
- setupNumericInputFilter(EditText, int): void
- setupDecimalInputFilter(EditText, int): void
- showDateTimePicker(): void
- updateDateTimeDisplay(): void
- validateInputs(): boolean
- validateBloodPressure(): boolean
- validateHeartRate(): boolean
- validateOxygenSaturation(): boolean
- validateGlucose(): boolean
- validateRespiratoryRate(): boolean
- validateWeight(): boolean
- validateAndSaveVitals(): void
- sendVitalsToServer(JSONObject): void
- saveVitalsLocally(JSONObject): void
- showError(String): void
Wellness_Center extends AppCompatActivity
+onCreate(savedInstanceState: Bundle): void
+setImageClickListeners(): void
- openActivity(title: String, activityClass: Class<?>): void
- openWebLink(url: String): void


SecondFragment
(extends Fragment)
- binding: FragmentSecondBinding
+ onCreateView(inflater, container, bundle): View
+ onViewCreated(view: View, bundle: Bundle): void
+ onDestroyView(): void
Settings(extends BaseActivity)
- prefs: SharedPreferences
- notificationsSwitch: Switch
highContrastSwitch: Switch
- fontSizeSeekBar: SeekBar
- languageSpinner: Spinner
- updateButton: View
+ onCreate(savedInstanceState: Bundle): void
Update_Profile
(extends AppCompatActivity)
- userNameEditText: TextInputEditText
- passwordEditText: TextInputEditText
- firstNameEditText: TextInputEditText
- middleNameEditText: TextInputEditText
- lastNameEditText: TextInputEditText
- sidNumberEditText: TextInputEditText
- phoneNumberEditText: TextInputEditText
- dateOfBirthEditText: TextInputEditText
- weightEditText: TextInputEditText
- heightEditText: TextInputEditText
- healthConditionLayout: TextInputLayout
- healthConditionDropdown: AutoCompleteTextView
- genderRadioGroup: RadioGroup
- maleRadioButton: RadioButton
- femaleRadioButton: RadioButton
- forgotPasswordTextView: TextView
- saveChangesButton: Button
+ OperationA(params) : return
+ OperationB() : void
- OperationC() : void
Progress_Tracker
(extends AppCompatActivity
- TAG: String
- lineChart: LineChart
- systolicEntries: List<Entry>
- diastolicEntries: List<Entry>
- dates: List<String>
- currentWeekOffset: int
- DAYS_TO_SHOW: int
- displayDateFormat: SimpleDateFormat
- apiDateFormat: SimpleDateFormat
- dbDateFormat: SimpleDateFormat
- sharedPreferences: SharedPreferences
- tvSystolicValue: TextView
- tvDiastolicValue: TextView
+ onCreate(savedInstanceState: Bundle): void
- setupViews(): void
- setupChart(): void
- loadData(weekOffset: int): void
- fetchBloodPressureData(weekOffset: int): void
- processApiResponse(response: String): void
- updateChartWithData(measurements: JSONArray): void
- updateLatestMeasurements(measurements: JSONArray): void
Recipe
+ name: String
+ cookTime: String
+ calories: String
+ imageResId: int
+ ingredients: String[]
+ instructions: String
+ Recipe(name: String, cookTime: String, calories: String, imageResId: int, ingredients: String[], instructions: String)
Recipe_Results
(extends AppCompatActivity)
- back1: ConstraintLayout
- back2: ConstraintLayout
- back3: ConstraintLayout
- back4: ConstraintLayout
+ onCreate(savedInstanceState: Bundle): void
- initializeViews(): void
- applyFilters(allergies: List<String>, prefers: List<String>, preference: String, meat: String): void
- areAllRecipesHidden(): boolean
- showAllRecipes(): void
- setupClickListeners(): void
- openRecipeDetail(name: String): void


MainPage
- medication: ImageButton
- fitness: ImageButton
- wellness: ImageButton
- activity_tracker: ImageButton
- progress_tracker: ImageButton
- health_status: ImageButton
- recipes: ImageButton
- drawerLayout: DrawerLayout
- sharedPreferences: SharedPreferences
+ onCreate(savedInstanceState: Bundle): void
- checkActivityCompletion(): void
- showLogoutConfirmationDialog(): void
- performLogout(): void
+ onBackPressed(): void
Meal_Plan
- textToSpeech: TextToSpeech
- speakerIcon: ImageView
- isSpeaking: boolean
- txtContent: TextView
- titleTextView: TextView
+ onCreate(savedInstanceState: Bundle): void
- toggleSpeech(): void
- speakText(): void
- stopSpeaking(): void
+ onInit(status: int): void
+ onDestroy(): void
Implements:
- TextToSpeech.OnInitListener
Measurements_Result (Activity)
<<Attributes>>
- systolic: int
- diastolic: int
- glucose: int
- measurementTime: String
- reminderTime: String
<<UIElements>>
- bpResultView: TextView
- glucoseResultView: TextView
- bpDetailsView: TextView
- glucoseDetailsView: TextView
- measurementTimeView: TextView
- reminderTimeView: TextView
- doneButton: Button
<<Methods>>
+ onCreate(savedInstanceState: Bundle): void
- analyzeBloodPressure(systolic: int, diastolic: int): String
- getBloodPressureDetails(systolic: int, diastolic: int): String
- analyzeBloodGlucose(glucose: int, time: String): String
- getGlucoseDetails(glucose: int, time: String): String
BaseActivity
fontScale: float
isHighContrast: boolean
prefs: SharedPreferences
+ onCreate(savedInstanceState: Bundle): void
# applyAppTheme(): void
# applyFontScale(): void
Daily_Measurements
- systolicEditText: EditText
- diastolicEditText: EditText
- glucoseLevelsEditText: EditText
- glucoseMeasuredOptions: RadioGroup
- sharedPreferences: SharedPreferences
- dateValueTextView: TextView
- readingDateTime: Calendar
- dateTimePicker: DateTimePickerDialog
+onCreate(Bundle): void
- setupInputs(): void
- validateAndSaveMeasurements(): void
- validateBP(): boolean
- sendMeasurementsToServer(): void
- saveMeasurementsLocally(): void
- getSelectedMeasurementTime(): String
- navigateToResults(): void
- showError(String): void
Consultant_1 +2+3
+ onCreate(savedInstanceState: Bundle): void
Change_Password
+ onCreate(savedInstanceState: Bundle): void
Create_Profile
+ onCreate(savedInstanceState: Bundle): void


Activity_Result
- PREFS_NAME: String {static}
- SERVER_URL: String {static}
- sharedPreferences: SharedPreferences
- currentDate: String
+ onCreate(savedInstanceState: Bundle): void
- displayResults(completedTasks: int, totalTasks: int): void
- saveResultsToServer(completedTasks: int, totalTasks: int): void
- loadResultsFromServer(): void
- redirectToTracker(): void
<<extends>> AppCompatActivity
<<uses>> SharedPreferences
<<uses>> Intent
<<uses>> HttpURLConnection
<<uses>> JSONObject
<<uses>> TextView, Button
AboutUs
+ onCreate(savedInstanceState: Bundle): void
<<extends>>
AppCompatActivity
Activity_Tracker
- checkBoxes: ArrayList<CheckBox>
- completionMessage: TextView
- totalTasks: int
- checkboxesContainer: LinearLayout
- sharedPreferences: SharedPreferences
- currentDateFormatted: String
- completedTasksCount: int
+ onCreate(savedInstanceState: Bundle): void
- checkIfActivitiesCompletedToday(): void
- disableAllCheckboxes(): void
- loadActivities(): void
- displayActivities(activitiesArray: JSONArray): void
+ showAddActivityDialog(): void
- addNewActivityToServer(activityName: String): void
- saveCompletedActivities(): void
- navigateToResult(): void
- markActivitiesCompleted(activityIds: ArrayList<Integer>): void
+ updateCompletionMessage(): void
+ onSupportNavigateUp(): boolean
Appointment_Reminder
+ Fname
+ facultycoll
- btnNext: Button
+ onCreate(savedInstanceState: Bundle): void

4.7 Mind Map

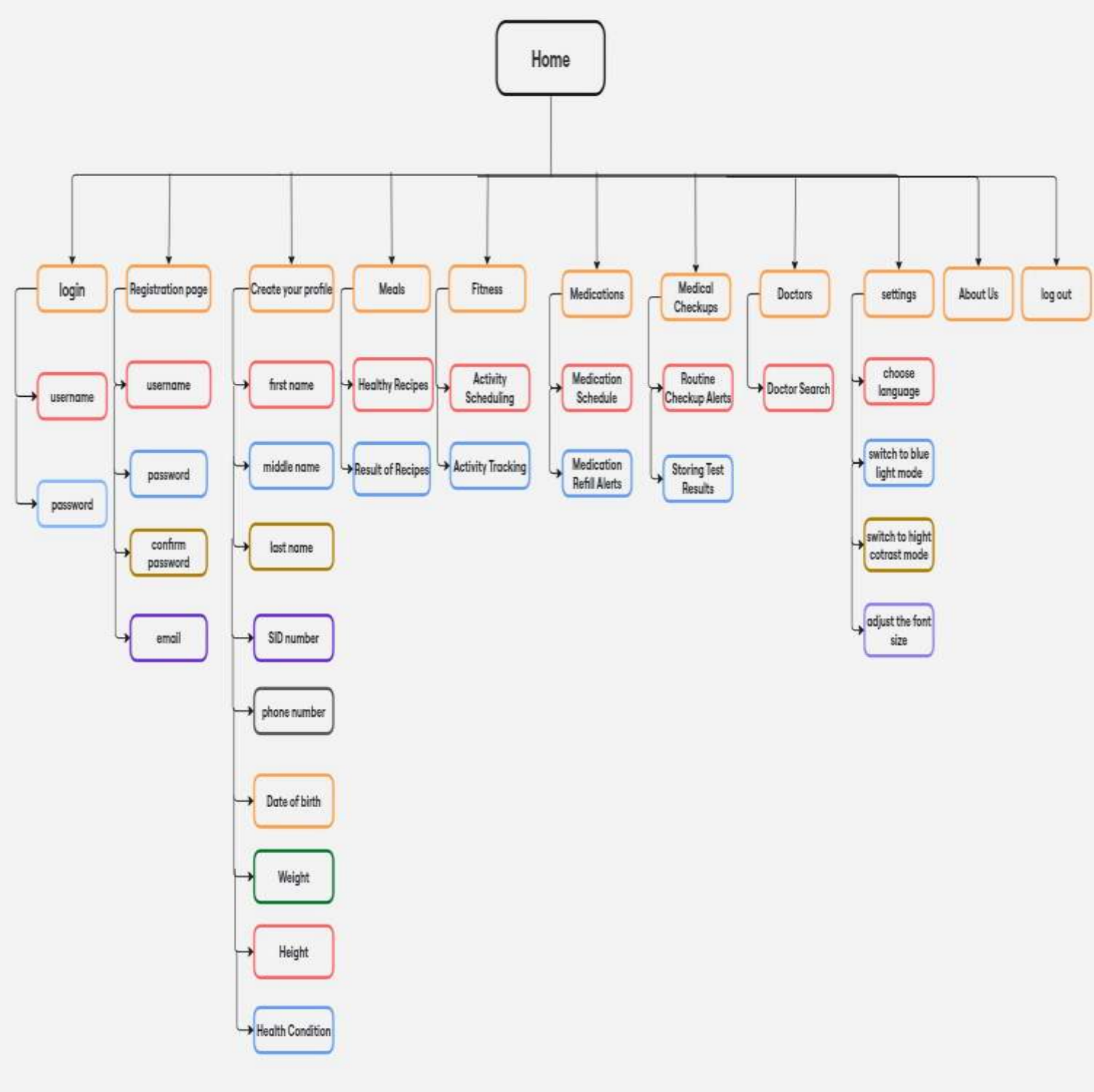


Figure 4.2: Mind Map [17]

4.8 Use Case Diagram

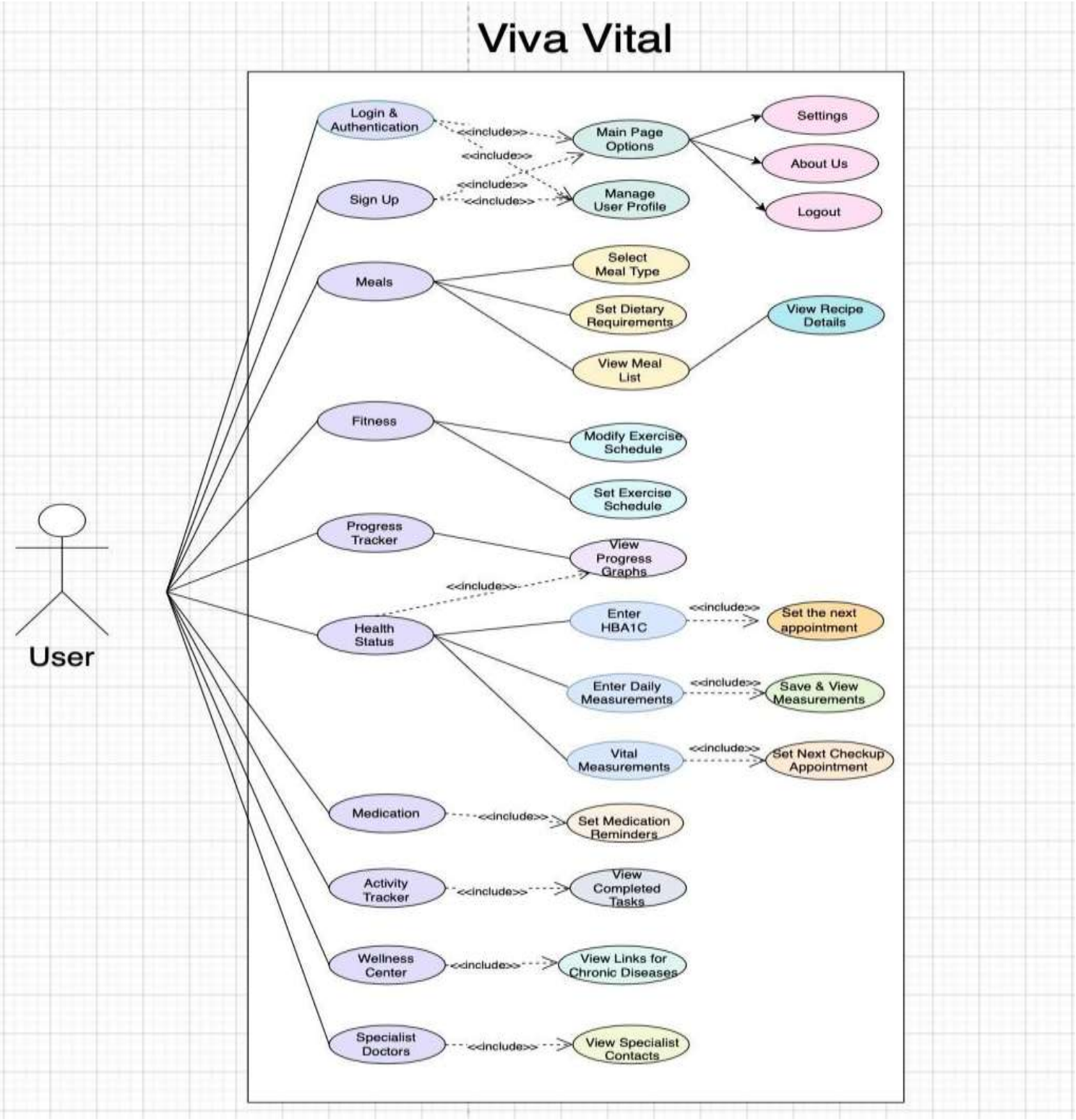


Figure 4.3: Use Case

4.9 Low-Fidelity Prototype

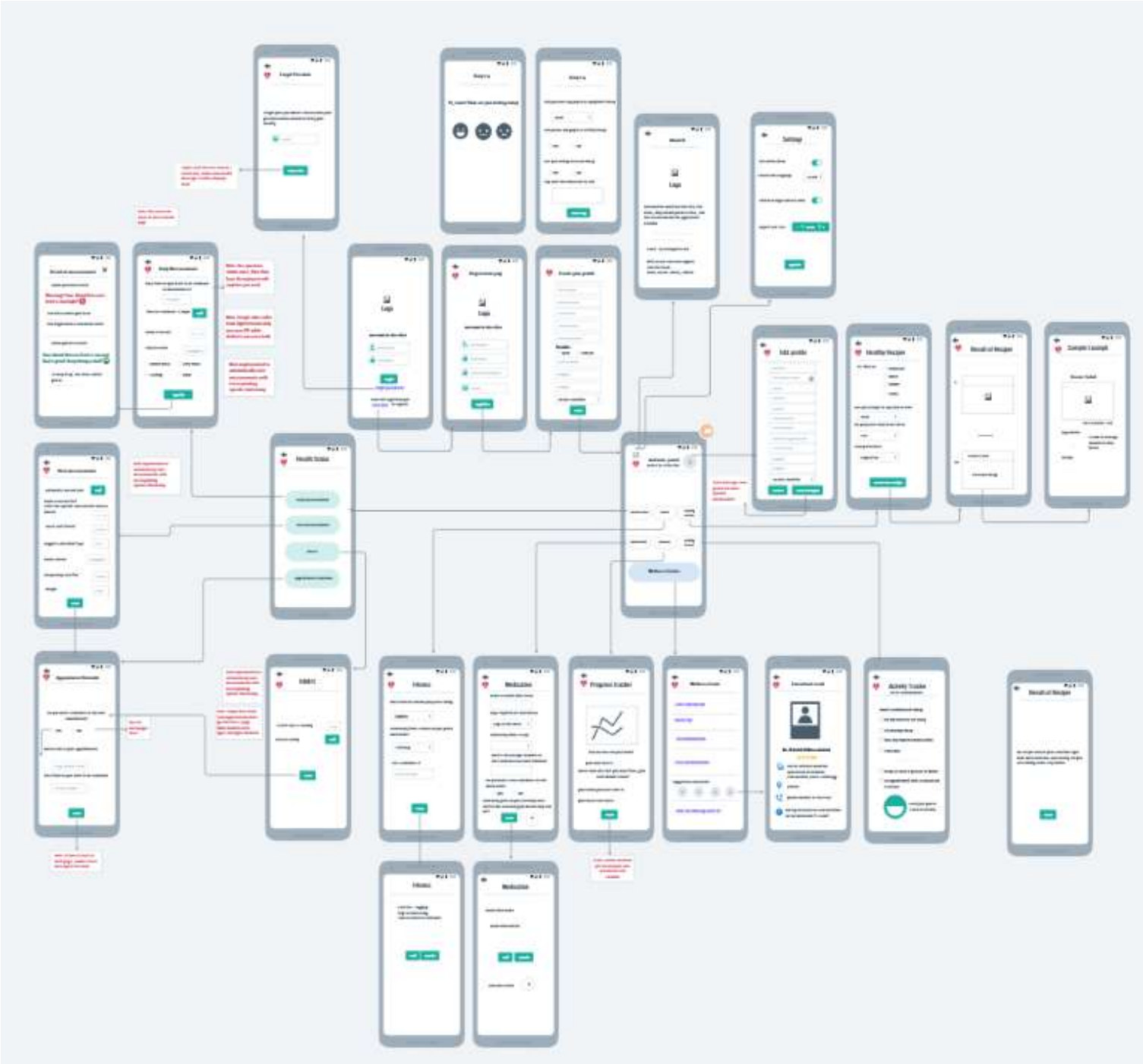
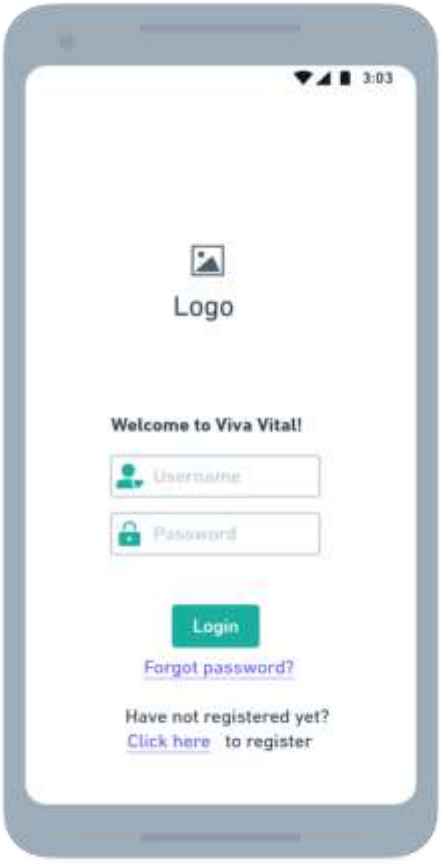
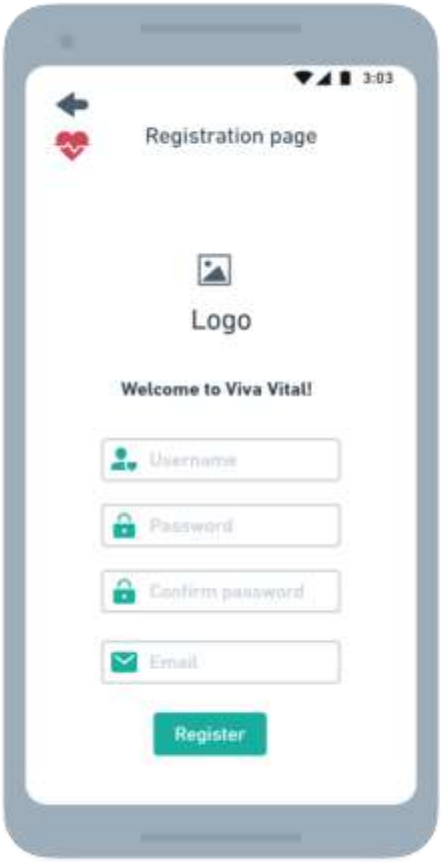
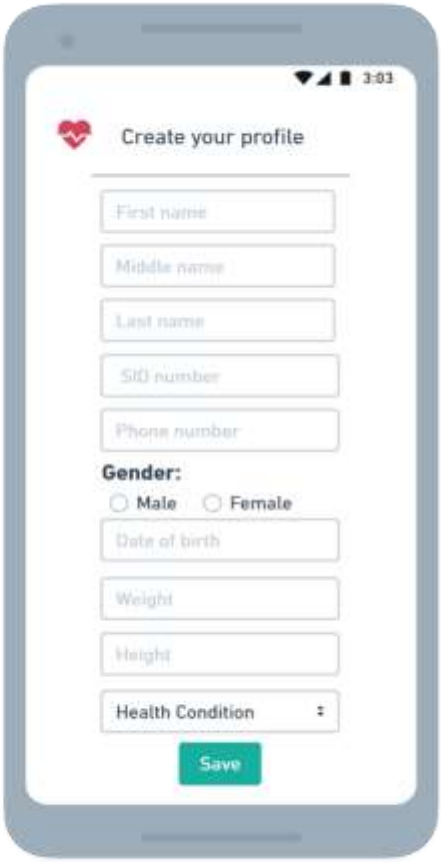
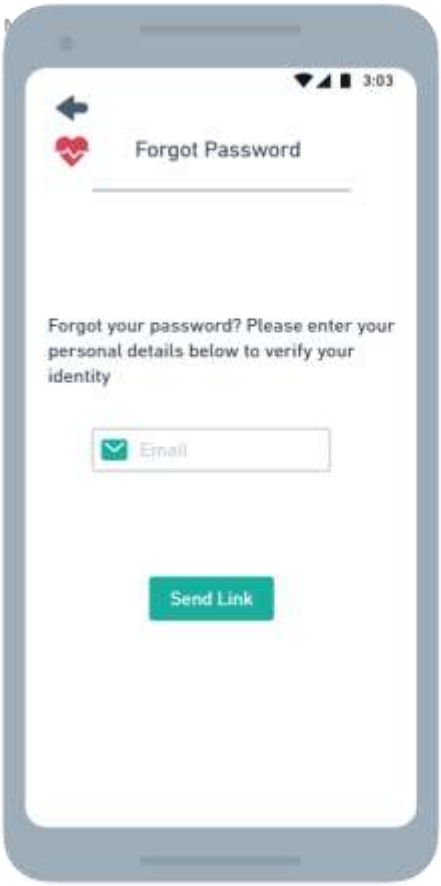


Figure 4.4: Low Prototype [17]

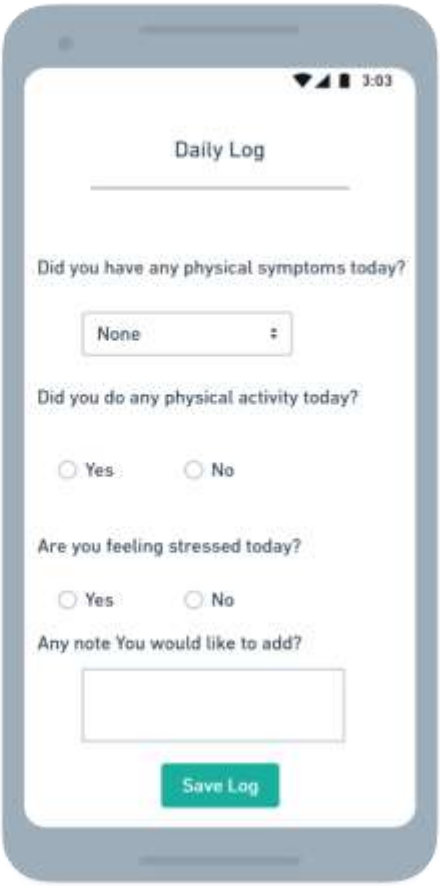

3:03
Logo
Welcome to Viva Vital!
Username
Password
Login
Forgot password?
Have not registered yet?
Click here to register


3:03
Registration page
Logo
Welcome to Viva Vital!
Username
Password
Confirm password
Email
Register

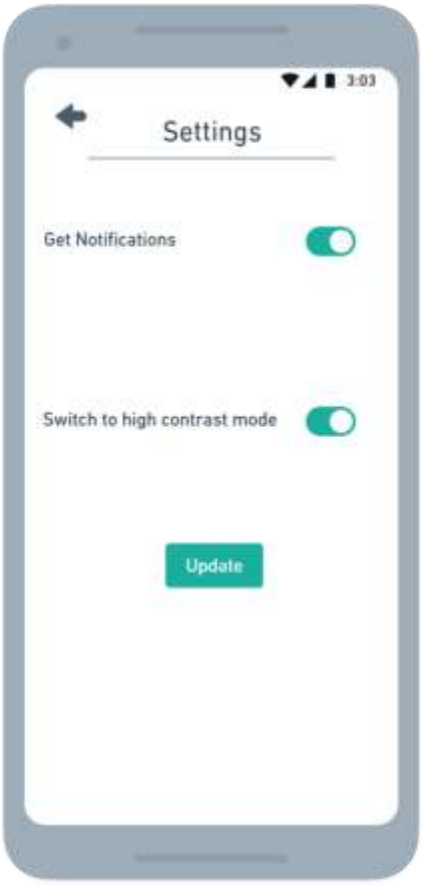

3:03
Create your profile
First name
Middle name
Last name
SID number
Phone number
Gender:
Male
Female
Date of birth
Weight
Height
Health Condition
Save

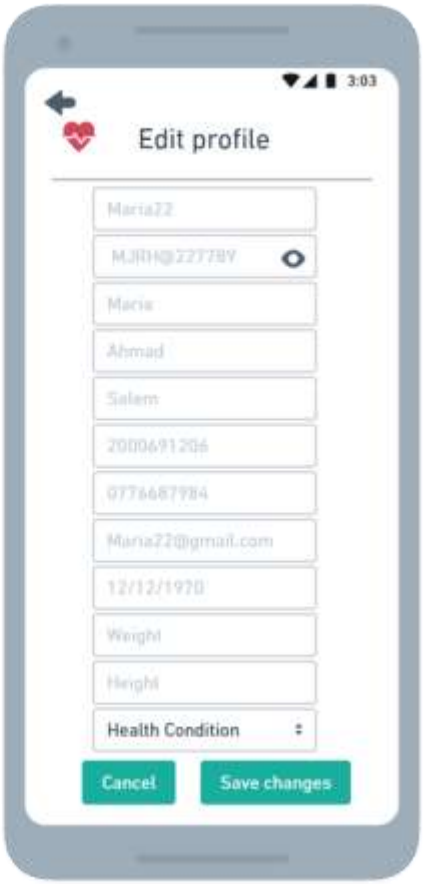

3:03
Forgot Password
Forgot your password? Please enter your personal details below to verify your identity
Email
Send Link

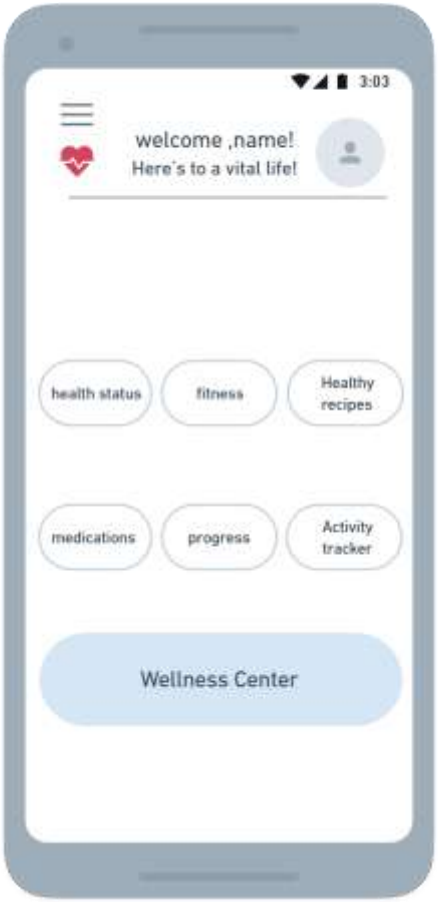

3:03
Daily Log
Hi, name! How are you feeling today?


3:03
Daily Log
Did you have any physical symptoms today?
None
Did you do any physical activity today?
Yes
No
Are you feeling stressed today?
Yes
No
Any note You would like to add?
Save Log

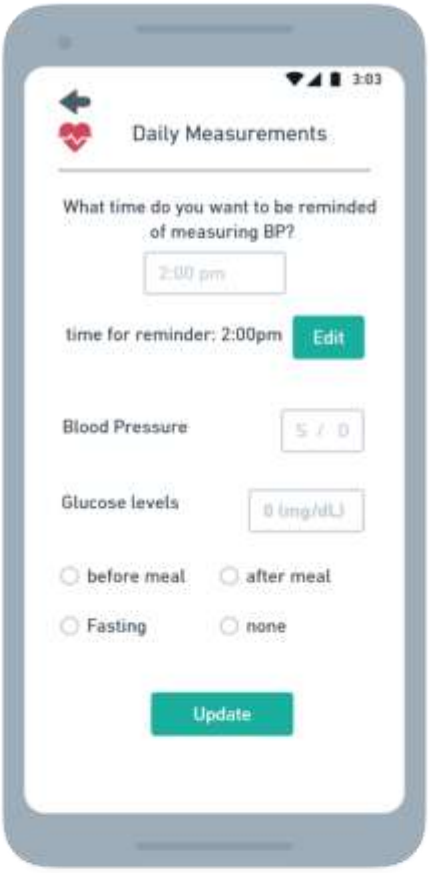

3:03
About Us
Logo
Information about the viva vital, the vitals, why should you be a vital , and the reason behind the application creation
Email : MJRH@gmail.com
With all our love and support,
The vital team
Heba, Razan , Malak, Juman

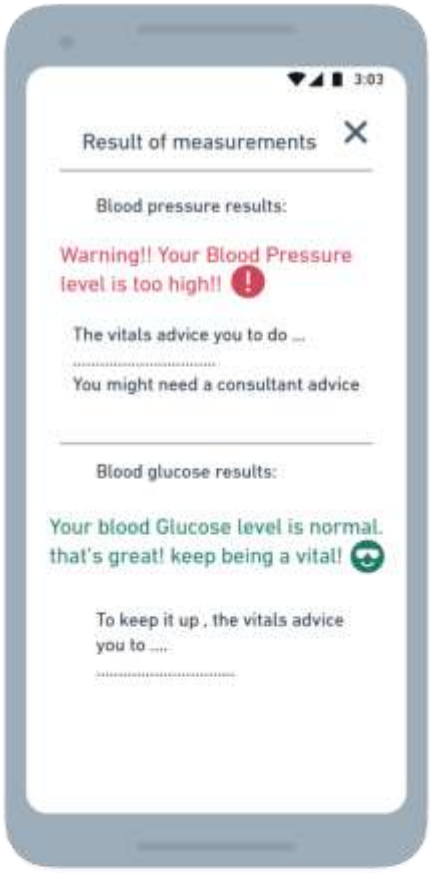

3:03
Settings
Get Notifications
Switch to high contrast mode
Update

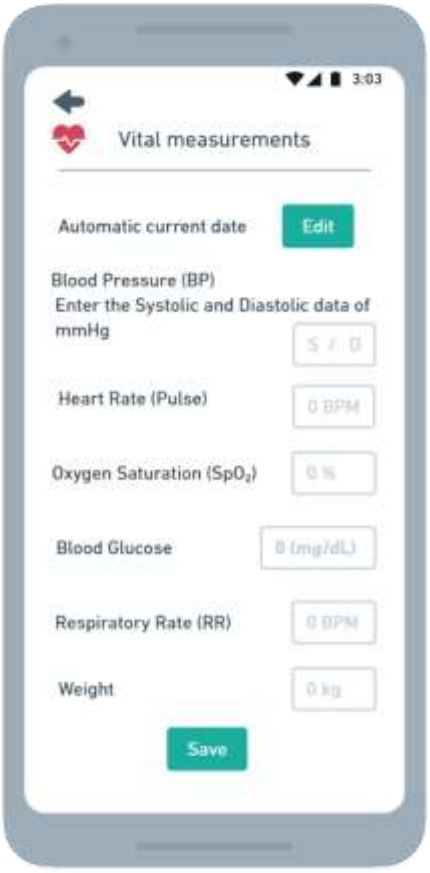

3:03
Edit profile
Maria22
MJRH@22778Y
Maria
Ahmad
Salem
2000691206
0776687984
Maria22@gmail.com
12/12/1970
Weight
Height
Health Condition
Cancel
Save changes

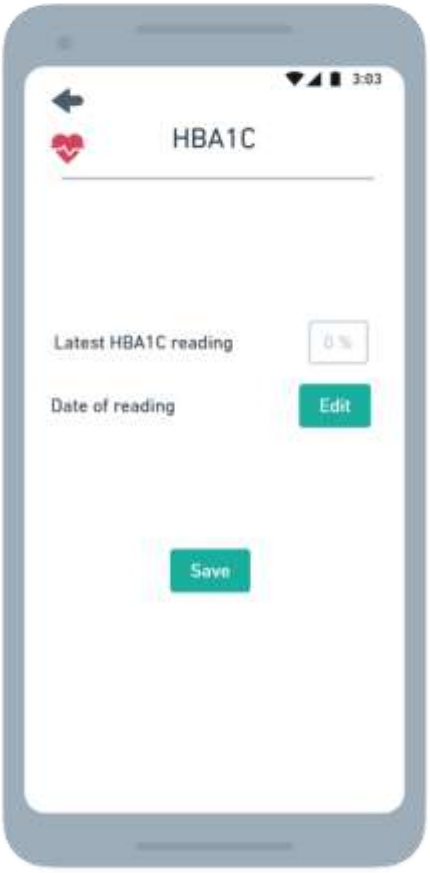

3:03
welcome ,name!
Here's to a vital life!
health status
fitness
Healthy recipes
medications
progress
Activity tracker
Wellness Center

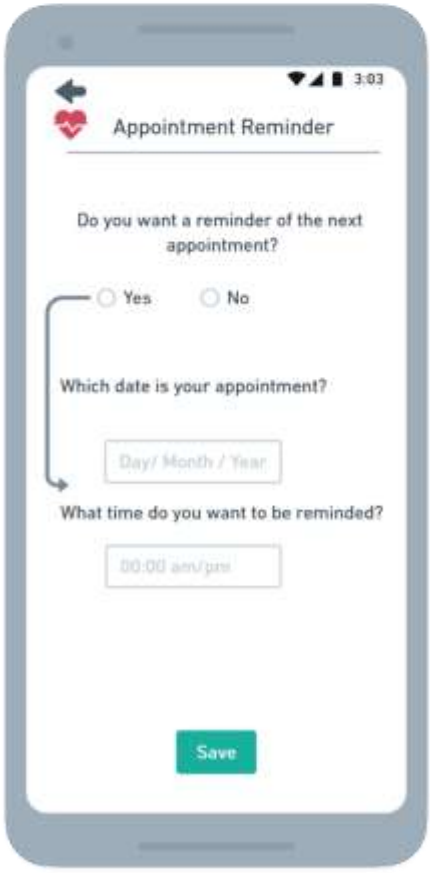

3:03
Health Status
Daily Measurements
Vital measurements
HBA1C
Appointment Reminder

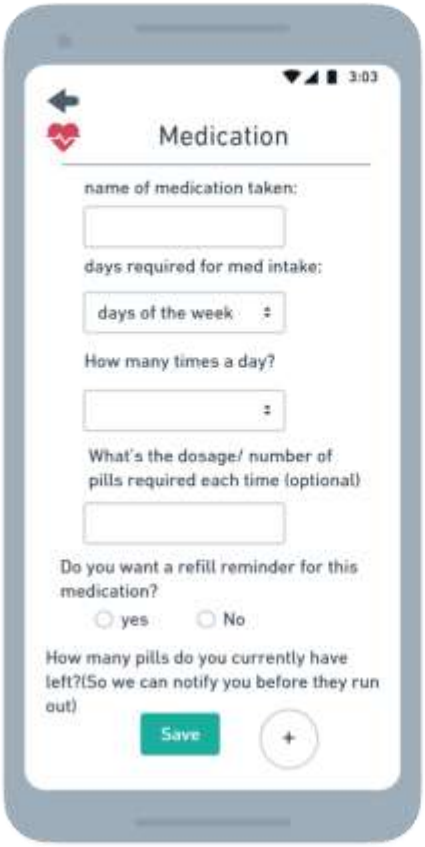

3:03
Daily Measurements
What time do you want to be reminded of measuring BP?
2:00 pm
time for reminder: 2:00pm
Edit
Blood Pressure
5 / 0
Glucose levels
0 (mg/dL)
before meal
after meal
Fasting
none
Update

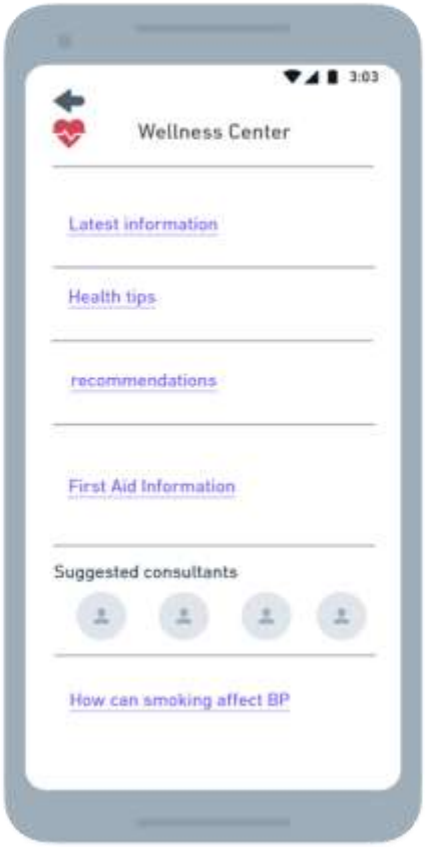

3:03
Result of measurements
Blood pressure results:
Warning!! Your Blood Pressure level is too high!!
The vitals advice you to do ...
You might need a consultant advice
Blood glucose results:
Your blood Glucose level is normal. that's great! keep being a vital!
To keep it up , the vitals advice you to ....


3:03
Vital measurements
Automatic current date
Edit
Blood Pressure (BP)
Enter the Systolic and Diastolic data of mmHg
5 / 0
Heart Rate (Pulse)
0 BPM
Oxygen Saturation (SpO_2)
0 %
Blood Glucose
0 (mg/dL)
Respiratory Rate (RR)
0 BPM
Weight
0 kg
Save

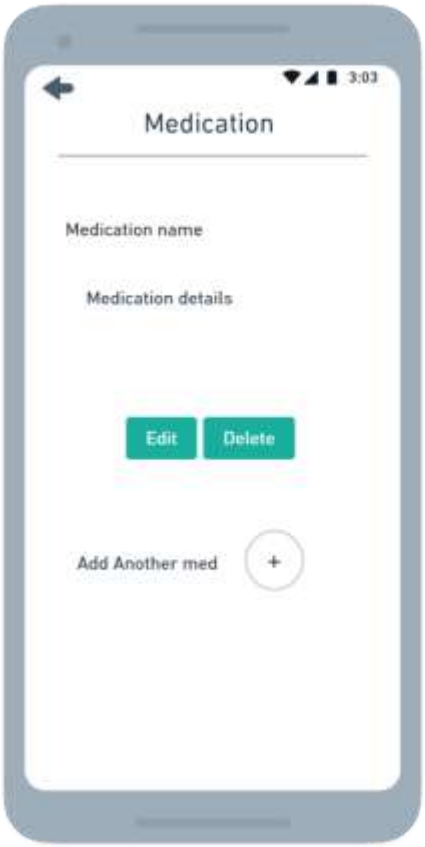

3:03
HBA1C
Latest HBA1C reading
0 %
Date of reading
Edit
Save

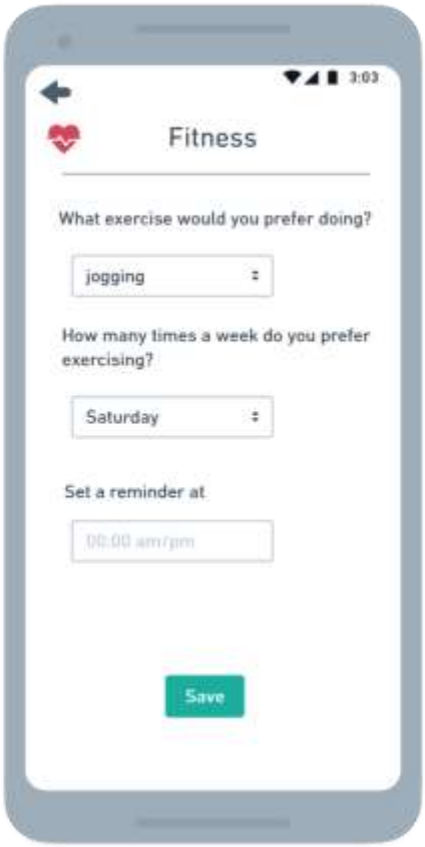

3:03
Appointment Reminder
Do you want a reminder of the next appointment?
Yes
No
Which date is your appointment?
Day/ Month / Year
What time do you want to be reminded?
00:00 am/pm
Save

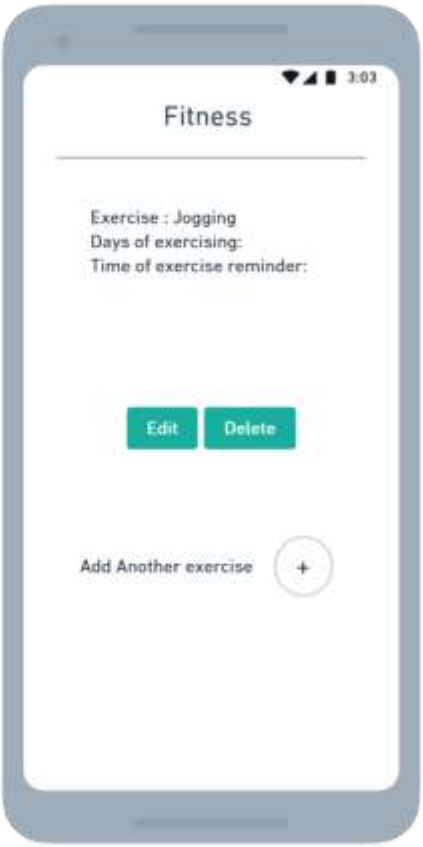

3:03
Medication
name of medication taken:
days required for med intake:
days of the week
How many times a day?
What's the dosage/ number of pills required each time (optional)
Do you want a refill reminder for this medication?
yes
No
How many pills do you currently have left?(So we can notify you before they run out)
Save

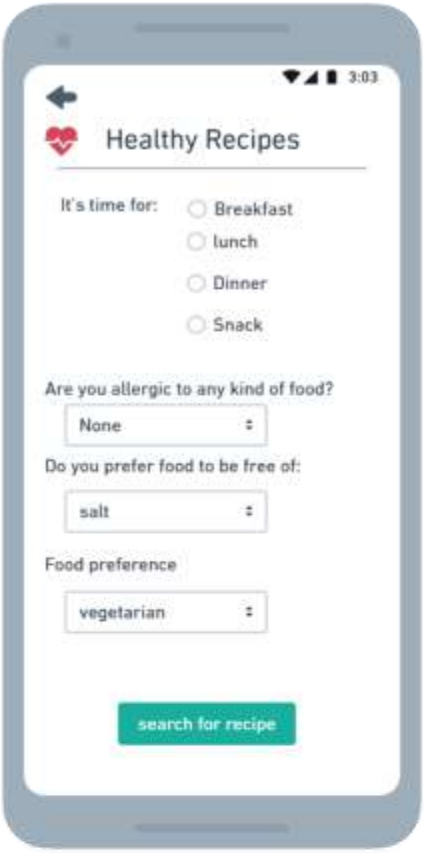

3:03
Wellness Center
Latest information
Health tips
recommendations
First Aid Information
Suggested consultants
How can smoking affect BP

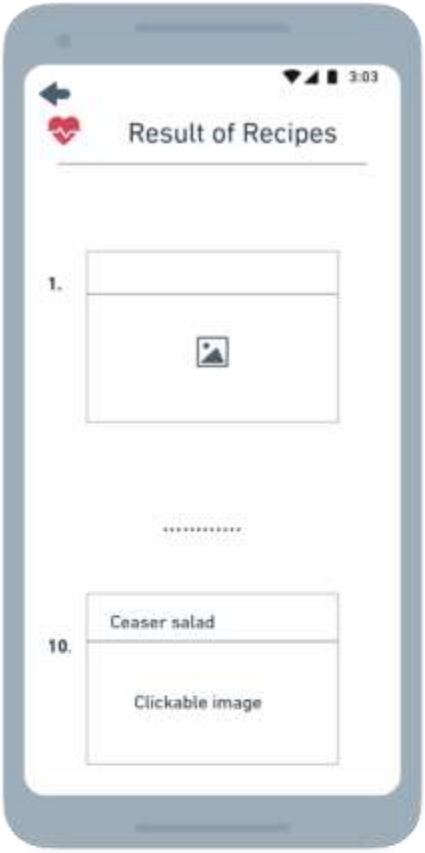

3:03
Consultant result
Dr. Khalid Alkharabsheh
Doctor Internal Medicine specialized in Diabetes Consultation, Adult Cardiology
Amman
phone number:0778695867
Mostly available for consultations on the weekends (5-8 pm)


3:03
Medication
Medication name
Medication details
Edit
Delete
Add Another med


3:03
Fitness
What exercise would you prefer doing?
jogging
How many times a week do you prefer exercising?
Saturday
Set a reminder at
00:00 am/pm
Save

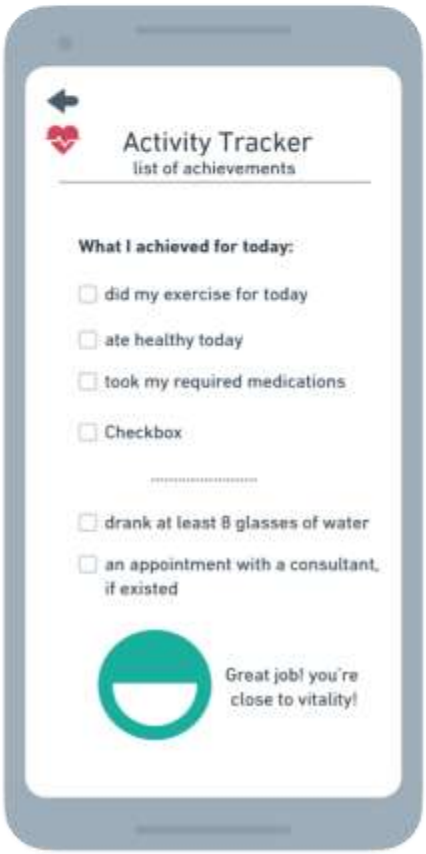

3:03
Fitness
Exercise : Jogging
Days of exercising:
Time of exercise reminder:
Edit
Delete
Add Another exercise


3:03
Healthy Recipes
It's time for:
Breakfast
lunch
Dinner
Snack
Are you allergic to any kind of food?
None
Do you prefer food to be free of:
salt
Food preference
vegetarian
search for recipe


3:03
Result of Recipes
1.
.....
10.
Ceaser salad
Clickable image


3:03
Sample Example
Ceaser Salad
Total calories: 400
Ingredients:
//How to manage amount of food intake .
Recipe:


3:03
Result of Recipes
No recipes match your selection right now. More delicious and healthy recipes are coming soon! Stay tuned!
Done


Activity Tracker
list of achievements
What I achieved for today:
did my exercise for today
ate healthy today
took my required medications
Checkbox
drank at least 8 glasses of water
an appointment with a consultant, if existed
Great job! you're close to vitality!


3:03
Progress tracker
tracker over the past month
your bmi level is .....
which indicates that you must (lose, gain , keep weight stable)
your blood pressure level is ....
your heart rate levels .....
Done

4.10 High fidelty Prototype

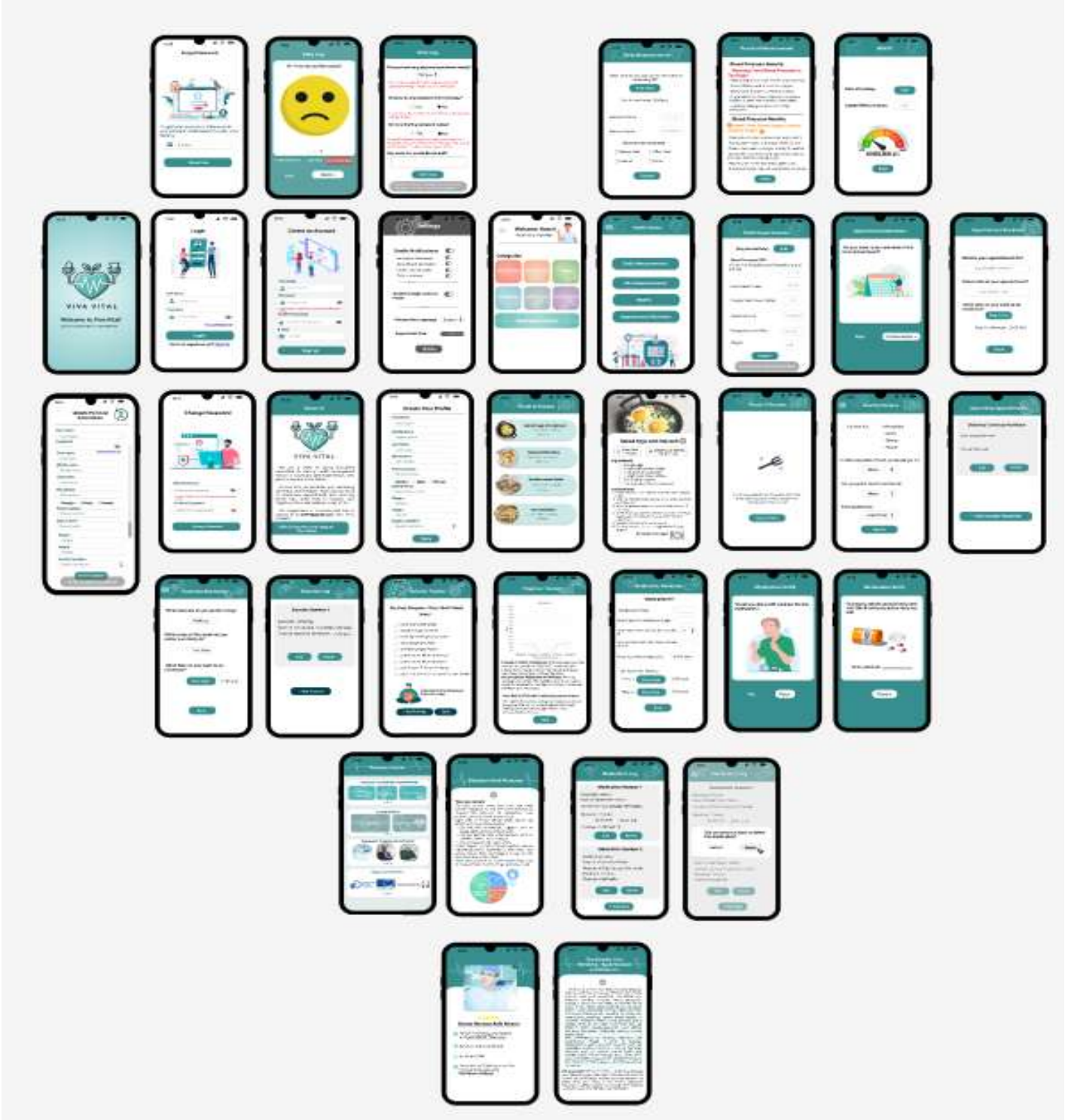
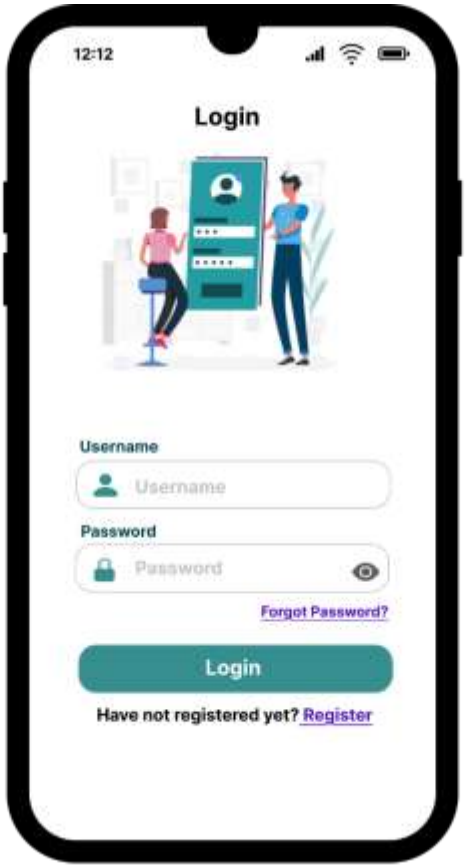
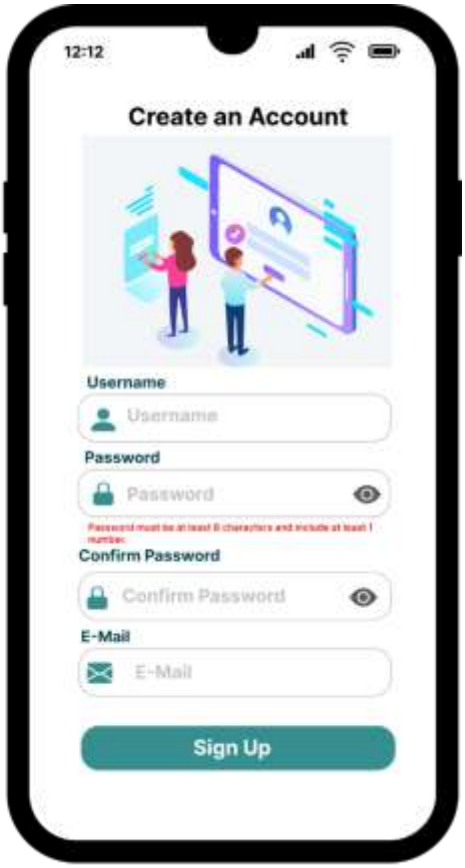
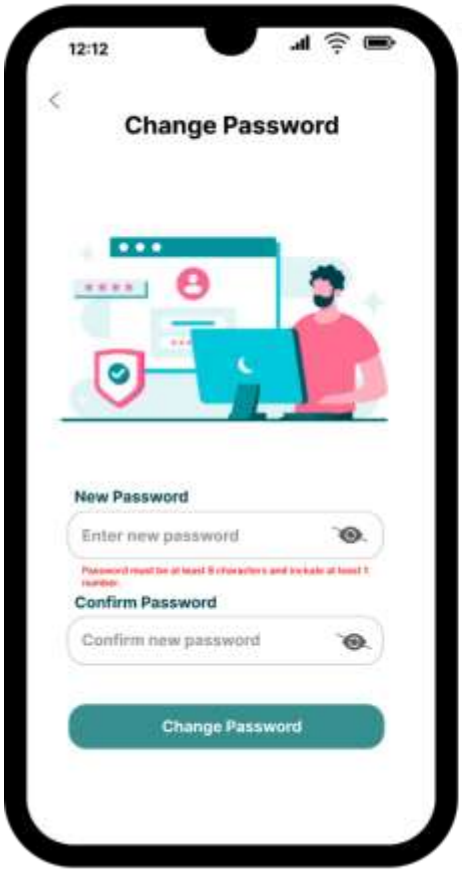


Figure 4.5: High Prototype [18]

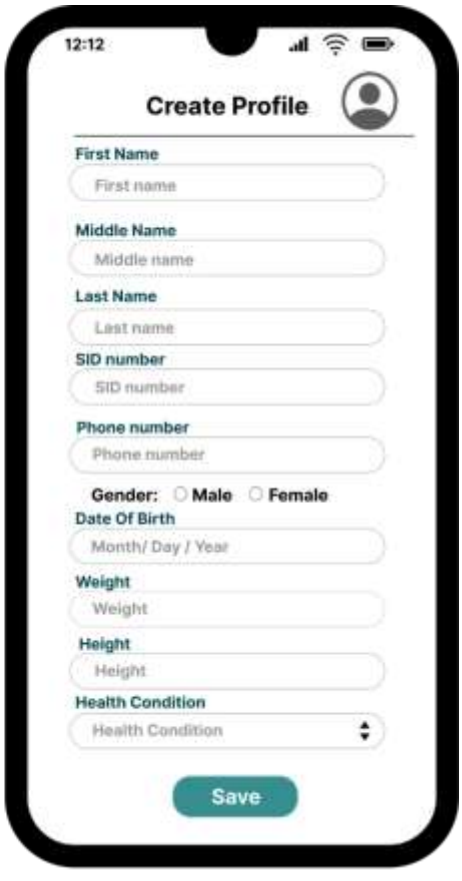

12:12
VIVA VITAL
Welcome to Viva Vital!
your trusted health companion

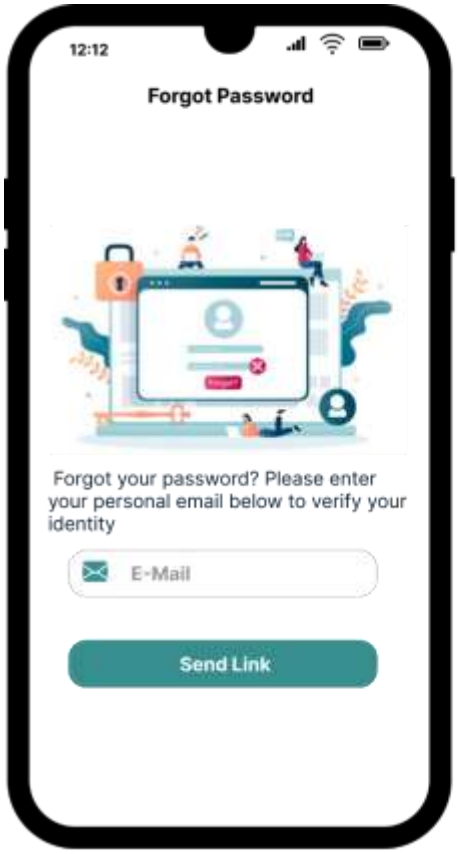

12:12
Login
Username
Username
Password
Password
Forgot Password?
Login
Have not registered yet? Register


12:12
Create an Account
Username
Username
Password
Password
Confirm Password
Confirm Password
E-Mail
E-Mail
Sign Up

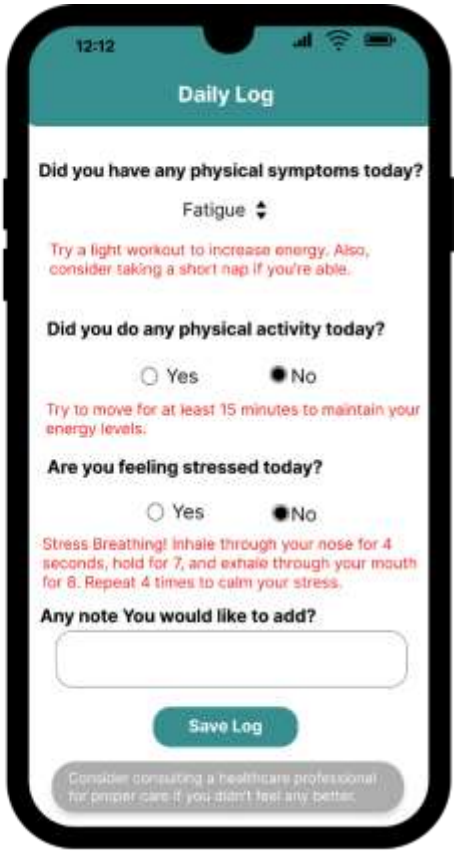

12:12
Change Password
New Password
Enter new password
Confirm Password
Confirm new password
Change Password

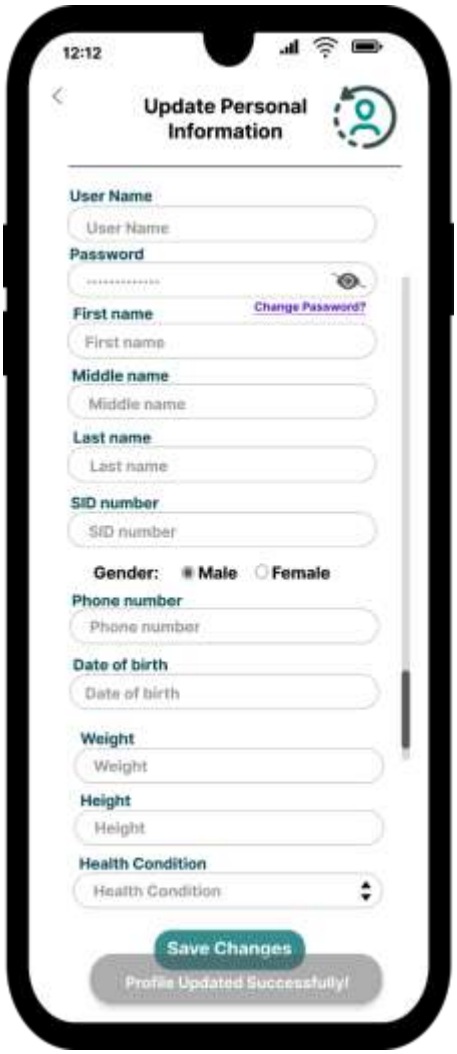

12:12
About Us
VIVA VITAL
We are a team of young innovators committed to making health management easier for individuals with hypertension, with plans to expand in the future.
At Viva Vital, we prioritize your well-being and value your feedback. From tracking vitals to scheduling appointments and receiving health tips, we're here to support you. Together, let's make wellness a way of life.
For suggestions or concerns, feel free to contact us at MJRH@gmail.com. Your voice matters!
With all our love and support,
The Vitals

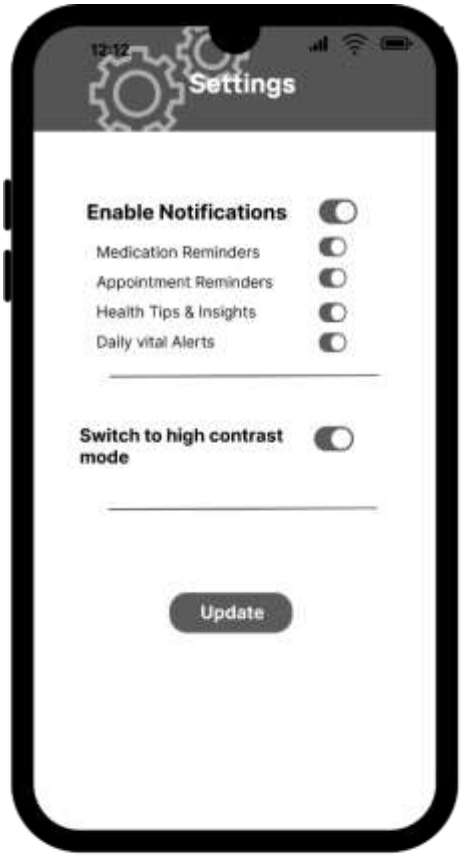

12:12
Create Profile
First Name
First name
Middle Name
Middle name
Last Name
Last name
SID number
SID number
Phone number
Phone number
Gender: Male Female
Date Of Birth
Month/ Day / Year
Weight
Weight
Height
Height
Health Condition
Health Condition
Save


12:12
Forgot Password
Forgot your password? Please enter your personal email below to verify your identity
E-Mail
Send Link

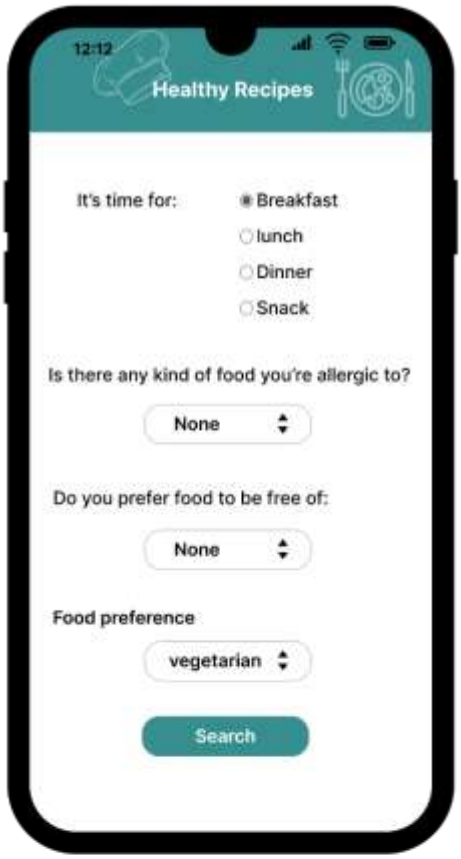

12:12
Daily Log
Hi, How do you feel today?
A complete Vital
Just Okay
Not Feeling Well
Skip
Next >

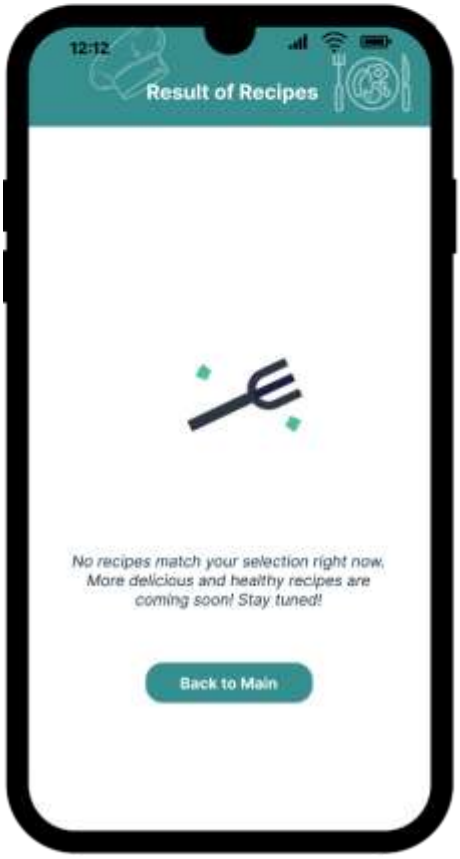

12:12
Daily Log
Did you have any physical symptoms today?
Fatigue
Try a light workout to increase energy. Also, consider taking a short nap if you're able.
Did you do any physical activity today?
Yes
No
Try to move for at least 15 minutes to maintain your energy levels.
Are you feeling stressed today?
Yes
No
Stress Breathing! Inhale through your nose for 4 seconds, hold for 7, and exhale through your mouth for 8. Repeat 4 times to calm your stress.
Any note You would like to add?
Save Log
Consider consulting a healthcare professional for proper care if you didn't feel any better.


12:12
Update Personal Information
User Name
User Name
Password
Change Password?
First name
First name
Middle name
Middle name
Last name
Last name
SID number
SID number
Gender:
Male
Female
Phone number
Phone number
Date of birth
Date of birth
Weight
Weight
Height
Height
Health Condition
Health Condition
Save Changes
Profile Updated Successfully!


12:12
Settings
Enable Notifications
Medication Reminders
Appointment Reminders
Health Tips & Insights
Daily vital Alerts
Switch to high contrast mode
Update


12:12
Welcome, Name!
Here's to a Vital life!
Categories
Health Status
Healthy Recipes
Fitness
Medication
Activity Tracker
Progress Tracker
Wellness Center


12:12
Healthy Recipes
It's time for:
Breakfast
lunch
Dinner
Snack
Is there any kind of food you're allergic to?
None
Do you prefer food to be free of:
None
Food preference
vegetarian
Search


12:12
Result of Recipes
No recipes match your selection right now. More delicious and healthy recipes are coming soon! Stay tuned!
Back to Main


12:12
Result of Recipes
Baked Eggs with Spinach
205 kcal
Banana Pancakes
Cook Time: 12 minutes
290 kcal
Mediterranean Salad
Cook Time: 5 minutes
275kcal
Tuna Sandwich
Cook Time: 8 minutes
300kcal

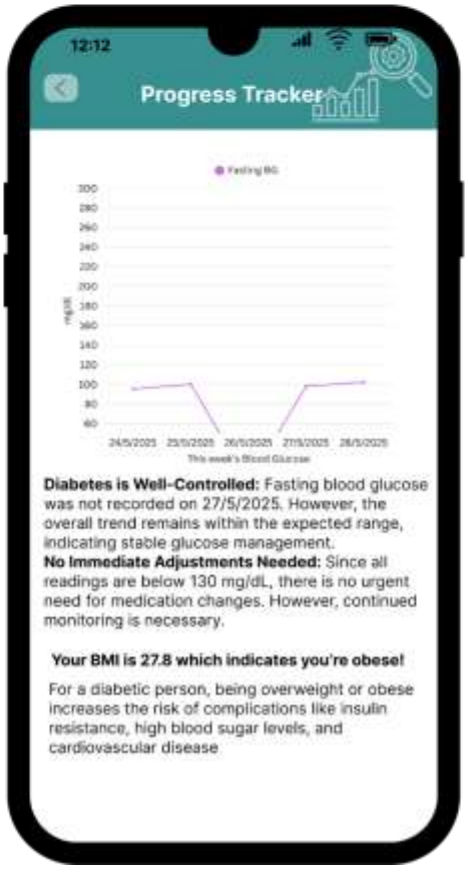

12:12
Baked Eggs with Spinach
Cook Time
7 minutes
Calories per serving
190-220 kcal
Ingredients
2 large eggs
1 cup fresh spinach (30g)
1 tsp olive oil (or butter)
1 small garlic clove, minced
Salt & black pepper
1 tbsp grated cheese (optional)
Instructions
1. Heat the olive oil (or butter) in a pan over medium heat.
2. Add the minced garlic and saute for a few seconds until fragrant.
3. Add the spinach and cook until wilted (about 1-2 minutes).
4. Crack the eggs directly into the pan and scramble them with the spinach, or cook them whole if preferred.
5. Season with salt and black pepper.
6. If using, sprinkle cheese on top and let it melt slightly.
Serve hot and enjoy!

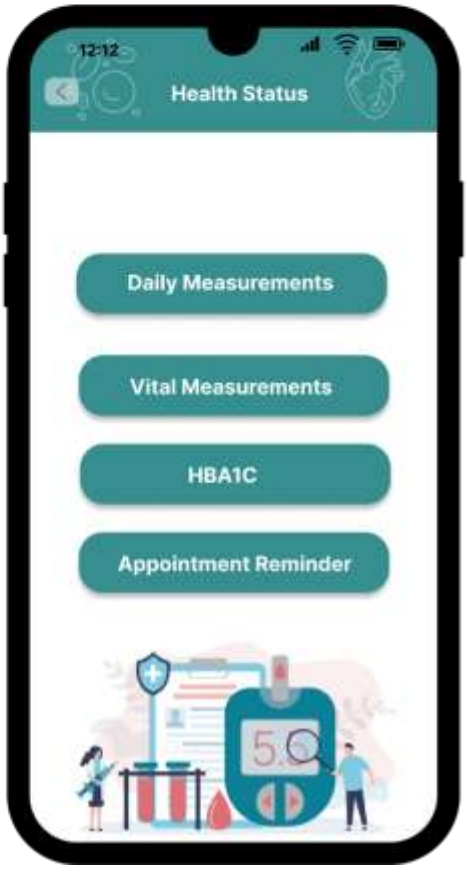

12:12
Wellness Center
food and exercise Recommendations
Health Insights
Suggested Consultants
Supportive Societies

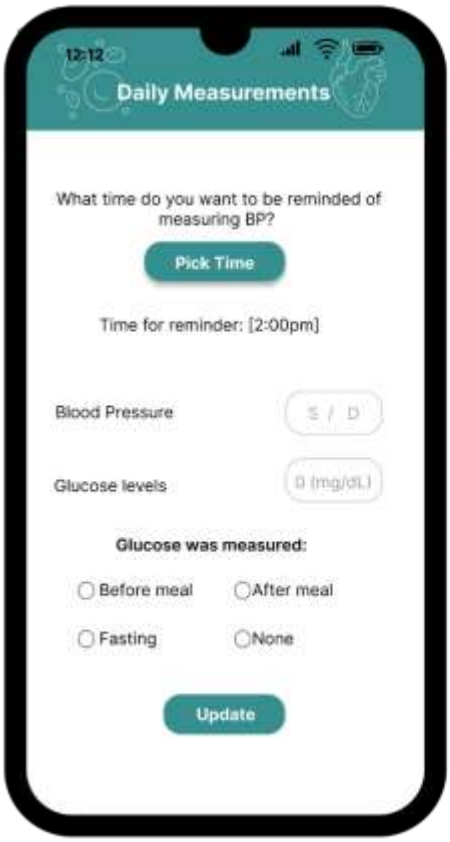

12:12
Diabetes Meal Planning
The plate method
It's easy to eat more food than you need without realizing it. Try the plate method to balance the amounts of vegetables, lean protein, and carb foods in your meal.
Start with a 9-inch dinner plate (about the length of a business envelope):
• Fill half with nonstarchy veggies, such as salad, green beans, and broccoli.
• Fill one quarter with a lean protein, such as chicken, beans, tofu, or eggs.
• Fill one quarter with carb foods.
Foods higher in carbs include grains, starchy vegetables (such as potatoes and peas), rice, pasta, beans, fruit, and yogurt. A cup of milk also counts as a carb food.
Then choose water or a low-calorie drink such as unsweetened iced tea to go with your meal.
Carb Foods
Protein Foods

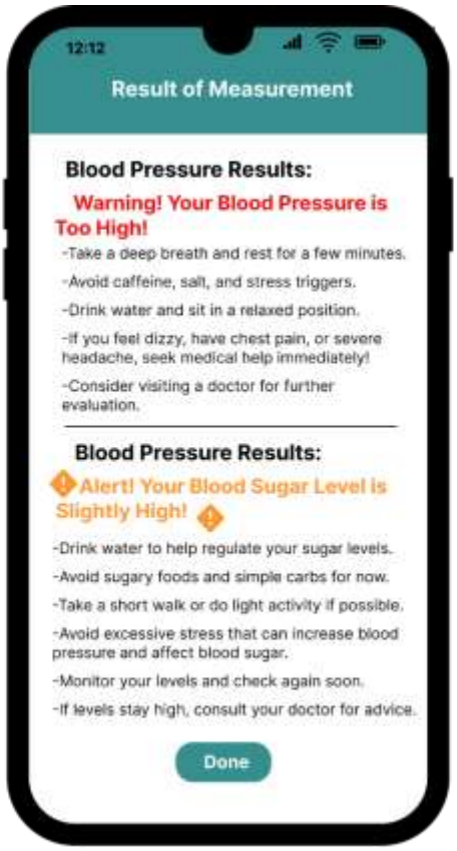

12:12
Doctor Marwan Adib Alnimri
Doctor Cardiology specialized in Hypertension Treatment.
Amman, AlKhaldi Street
07 9554 9491
Available for Online and in-clinic consultations everyday
[10:00am-3:00pm]


12:12
The Deadly Trio: Smoking, Hypertension and Diabetes
Smoking is a major risk factor for both diabetes and hypertension, and when combined, the effects become even more dangerous. For people with diabetes, smoking increases insulin resistance, making it harder for the body to regulate blood sugar. It also raises blood pressure and damages blood vessels, increasing the risk of heart disease, stroke, and kidney failure. Similarly, for those with hypertension, smoking causes blood vessels to constrict, leading to higher blood pressure and a greater strain on the heart. Over time, this can result in severe complications like heart attacks and poor circulation, potentially leading to limb amputations.
The combination of smoking, diabetes, and hypertension creates a cycle of damage, accelerating complications that could otherwise be controlled. Quitting smoking is one of the most effective ways to improve overall health and prevent these life-threatening risks. Even after years of smoking, stopping can significantly reduce the chances of heart disease and improve blood circulation.
Did you know? Within 20 minutes of quitting smoking, your blood pressure and heart rate start to return to normal. Within 12 hours, carbon monoxide levels in the blood drop, and within a few weeks, circulation improves, making it easier for people with diabetes and hypertension to manage their conditions.

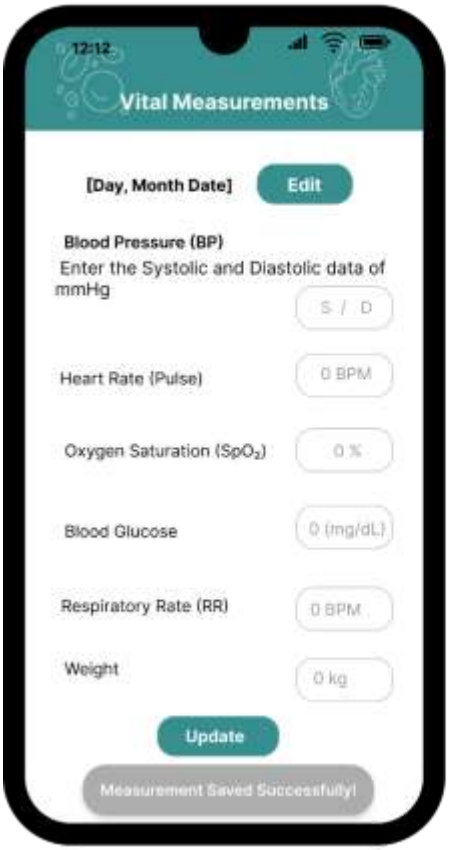

12:12
Progress Tracker
Fasting BG
mg/dl
24/5/2025
25/5/2025
26/5/2025
27/5/2025
28/5/2025
This week's Blood Glucose
Diabetes is Well-Controlled: Fasting blood glucose was not recorded on 27/5/2025. However, the overall trend remains within the expected range, indicating stable glucose management.
No Immediate Adjustments Needed: Since all readings are below 130 mg/dL, there is no urgent need for medication changes. However, continued monitoring is necessary.
Your BMI is 27.8 which indicates you're obese!
For a diabetic person, being overweight or obese increases the risk of complications like insulin resistance, high blood sugar levels, and cardiovascular disease

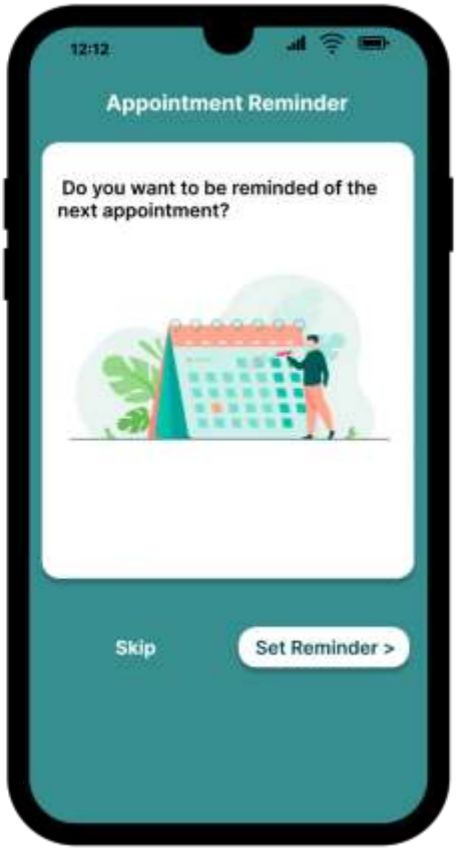

12:12
Health Status
Daily Measurements
Vital Measurements
HBA1C
Appointment Reminder
5.6

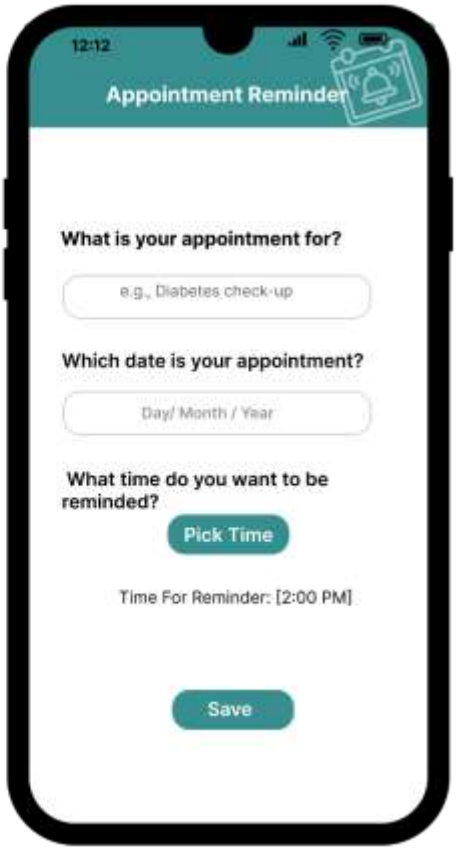

12:12
Daily Measurements
What time do you want to be reminded of measuring BP?
Pick Time
Time for reminder: [2:00pm]
Blood Pressure
S / D
Glucose levels
0 (mg/dL)
Glucose was measured:
Before meal
After meal
Fasting
None
Update

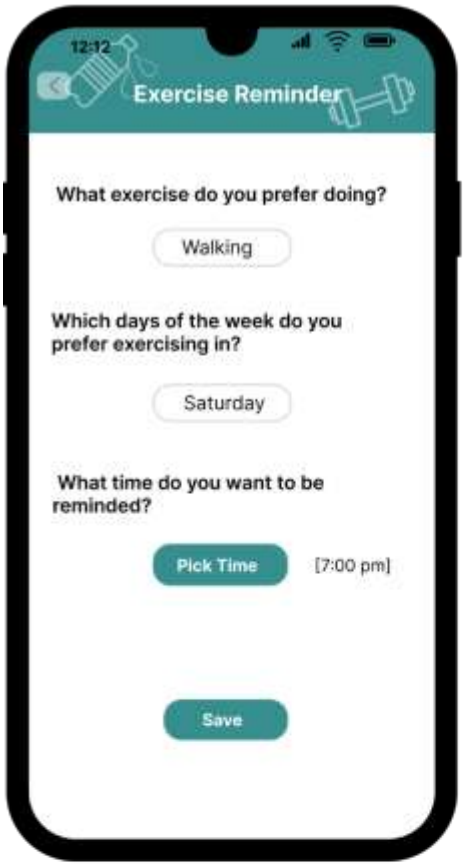

12:12
Result of Measurement
Blood Pressure Results:
Warning! Your Blood Pressure is Too High!
-Take a deep breath and rest for a few minutes.
-Avoid caffeine, salt, and stress triggers.
-Drink water and sit in a relaxed position.
-If you feel dizzy, have chest pain, or severe headache, seek medical help immediately!
-Consider visiting a doctor for further evaluation.
Blood Pressure Results:
Alert! Your Blood Sugar Level is Slightly High!
-Drink water to help regulate your sugar levels.
-Avoid sugary foods and simple carbs for now.
-Take a short walk or do light activity if possible.
-Avoid excessive stress that can increase blood pressure and affect blood sugar.
-Monitor your levels and check again soon.
-If levels stay high, consult your doctor for advice.
Done

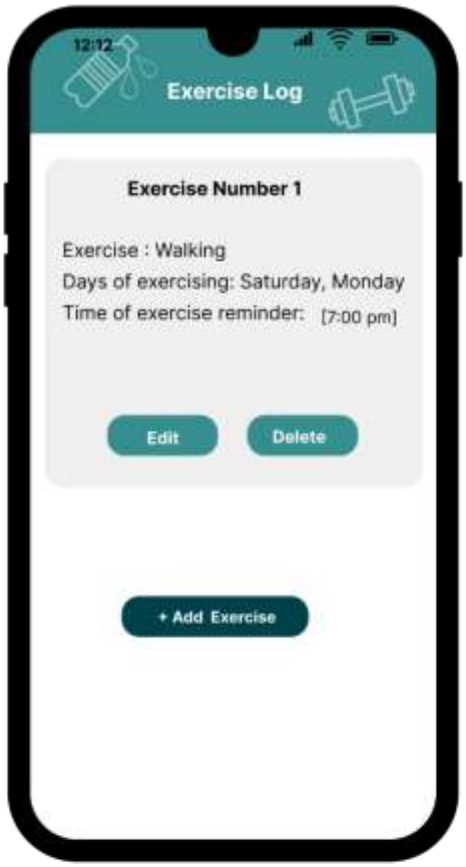

12:12
HBA1C
Date of reading
Edit
Latest HBA1C reading
0 %
5
6
7
8
9
10
LOW
HIGH
HEMOGLOBIN A1c
Save

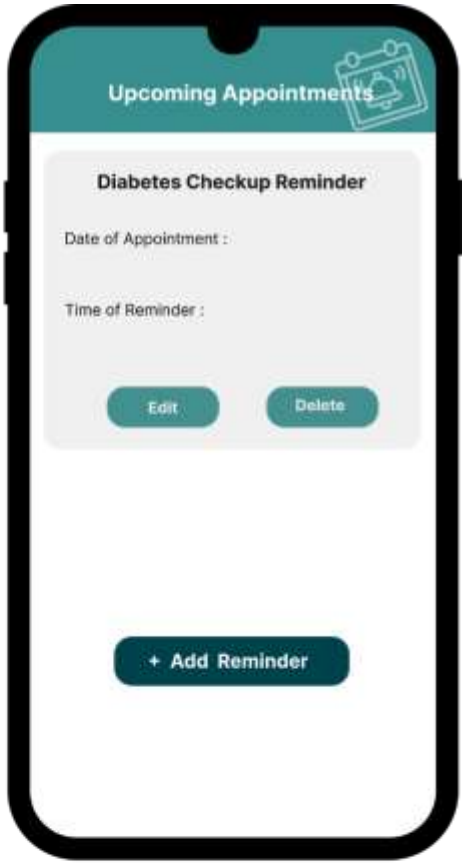

12:12
Vital Measurements
[Day, Month Date]
Edit
Blood Pressure (BP)
Enter the Systolic and Diastolic data of mmHg
S / D
Heart Rate (Pulse)
0 BPM
Oxygen Saturation (SpO2)
0 %
Blood Glucose
0 (mg/dL)
Respiratory Rate (RR)
0 BPM
Weight
0 kg
Update
Measurement Saved Successfully!

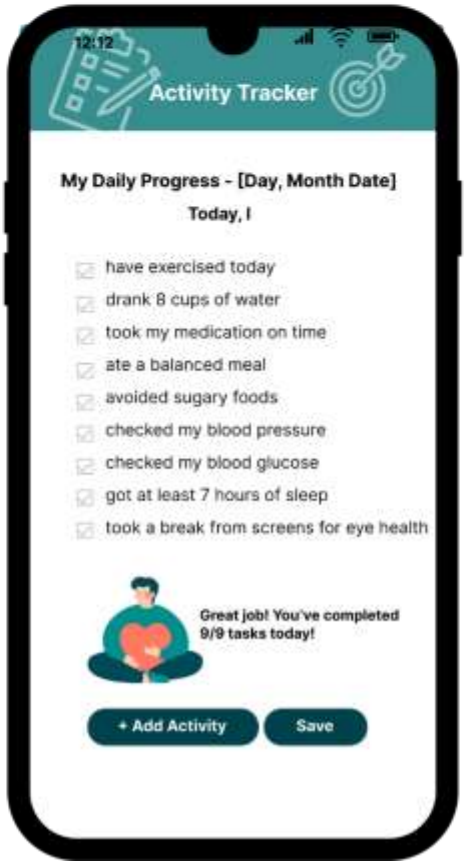

12:12
Appointment Reminder
Do you want to be reminded of the next appointment?
Skip
Set Reminder >

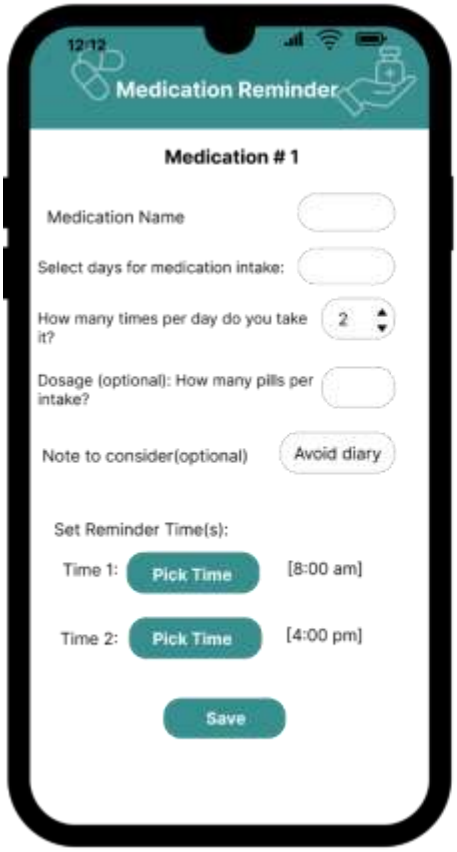

12:12
Appointment Reminder
What is your appointment for?
e.g., Diabetes check-up
Which date is your appointment?
Day/ Month / Year
What time do you want to be reminded?
Pick Time
Time For Reminder: [2:00 PM]
Save


12:12
Exercise Reminder
What exercise do you prefer doing?
Walking
Which days of the week do you prefer exercising in?
Saturday
What time do you want to be reminded?
Pick Time
[7:00 pm]
Save


12:12
Exercise Log
Exercise Number 1
Exercise : Walking
Days of exercising: Saturday, Monday
Time of exercise reminder: [7:00 pm]
Edit
Delete
+ Add Exercise

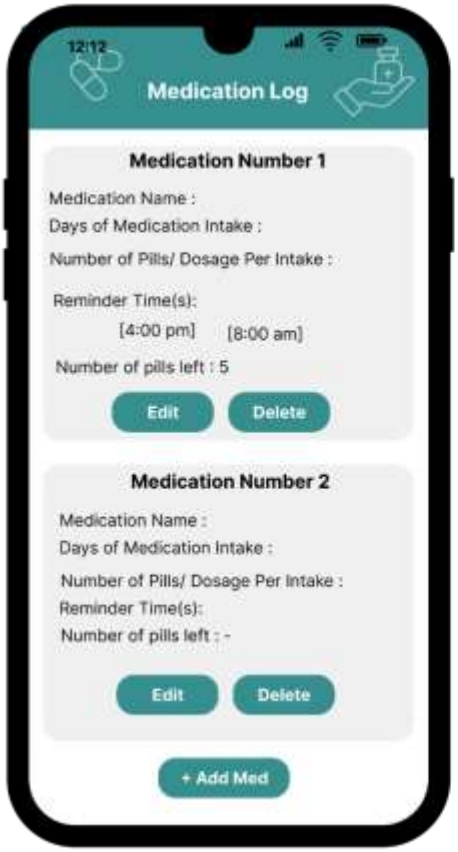

Upcoming Appointments
Diabetes Checkup Reminder
Date of Appointment :
Time of Reminder :
Edit
Delete
+ Add Reminder

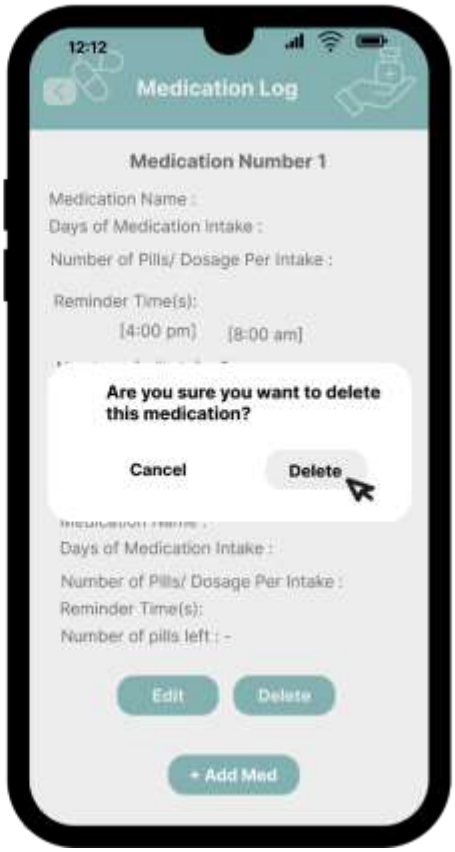

12:12
Activity Tracker
My Daily Progress - [Day, Month Date]
Today, I
have exercised today
drank 8 cups of water
took my medication on time
ate a balanced meal
avoided sugary foods
checked my blood pressure
checked my blood glucose
got at least 7 hours of sleep
took a break from screens for eye health
Great job! You've completed 9/9 tasks today!
+ Add Activity
Save


12:12
Medication Reminder
Medication # 1
Medication Name
Select days for medication intake:
How many times per day do you take it?
2
Dosage (optional): How many pills per intake?
Note to consider(optional)
Avoid diary
Set Reminder Time(s):
Time 1:
Pick Time
[8:00 am]
Time 2:
Pick Time
[4:00 pm]
Save


12:12
Medication Refill
Would you like a refill reminder for this medication?
No
Yes>


12:12
Medication Refill
How many pills do you currently have left? (We'll notify you before they run out)
Enter pills Left
Save>


12:12
Medication Log
Medication Number 1
Medication Name :
Days of Medication Intake :
Number of Pills/ Dosage Per Intake :
Reminder Time(s):
[4:00 pm] [8:00 am]
Number of pills left : 5
Edit
Delete
Medication Number 2
Medication Name :
Days of Medication Intake :
Number of Pills/ Dosage Per Intake :
Reminder Time(s):
Number of pills left : -
Edit
Delete
+ Add Med


12:12
Medication Log
Medication Number 1
Medication Name :
Days of Medication Intake :
Number of Pills/ Dosage Per Intake :
Reminder Time(s):
[4:00 pm] [8:00 am]
Are you sure you want to delete this medication?
Cancel
Delete
Days of Medication Intake :
Number of Pills/ Dosage Per Intake :
Reminder Time(s):
Number of pills left : -
Edit
Delete
+ Add Med

Chapter 5: Implementation Phase

5.1 Development Tools & Technologies

During the implementation phase of the ***Viva Vital*** application, the development team utilized a combination of client-side and server-side technologies to ensure efficient functionality, scalability, and maintainability.

- **Frontend (Android Application):** The Android application was developed using **Java** and **XML** via **Android Studio**. XML was used to design the user interface, matching the structure and flow of previously created high-fidelity prototypes. Java handled the application logic, business rules, and communication with the backend API.

- **Backend & Server-Side Logic: PHP** was used to create API endpoints and process data transactions between the frontend and backend. This allowed for secure user interactions and real-time data exchange.

- **Database Management:** The backend database was developed using **MySQL**, which provided structured, efficient storage and retrieval of user-related data. For easier database management, **phpMyAdmin** was employed as a web-based interface to interact with and manage the MySQL database.

- **Data Exchange Format: JSON (JavaScript Object Notation)** served as the primary data format for communication between the Android frontend and the PHP backend. It was used to structure payloads such as user authentication requests, data updates, and API responses.

- **UI Assets & Visuals:** User interface visuals and graphical elements were sourced from **iStock**, ensuring professional-quality imagery that aligned with the app's theme. For dynamic visual feedback and enhanced user engagement, **animations from LottieFiles** were integrated into the UI. [19][20]

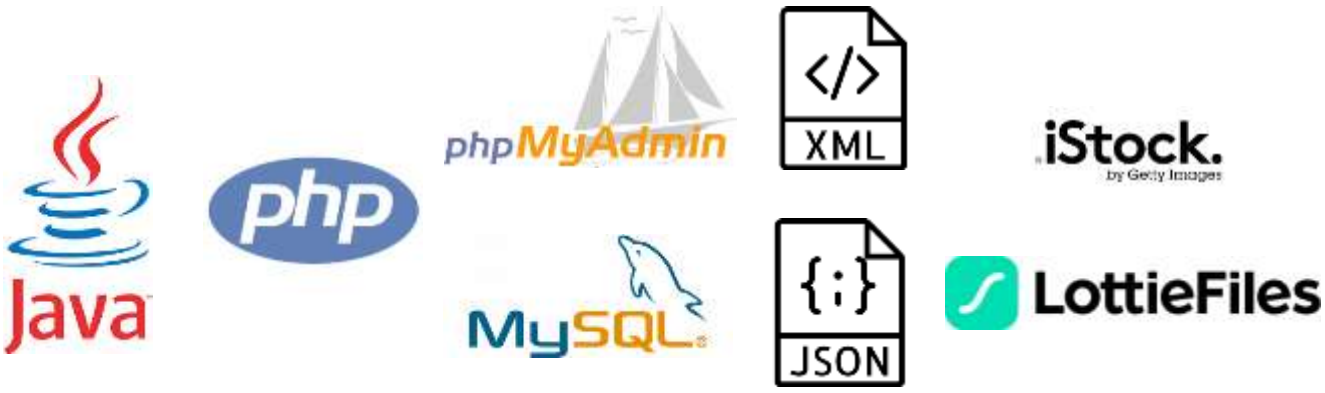


Figure 5.1: Main Tools and Technologies Used

5.2 Addressing Code Smell through Refactoring

During the coding phase of our application, the development team encountered various **code smell issues**, a common challenge in collaborative environments. Since we adopted **pair programming** as a key XP (Extreme Programming) practice, we divided ourselves into pairs working simultaneously on different parts of the codebase. One of the prominent issues was **duplicate code**, especially involving utility components like ***Date-Time Picker Dialogs***.

This duplication arose because both teams implemented their own versions of the same functionality. For instance, the **TimePickerDialog** and **DatePickerDialog** were redundantly written in various files, leading to **code repetition and decreased maintainability**. Below is a snippet from ***Hba1c.java*** and ***Appointment_Reminder2.java*** **(just an example of many):**

XP team 1 code >>

```
Hba1c.java | DateTimePickerDialog.java | activity_medication_log.xml | Medic
private void showDateTimePicker() {
    DatePickerDialog datePickerDialog = new DatePickerDialog(
            context: this,
            (view, year, month, dayOfMonth) -> {
                readingDateTime.set(year, month, dayOfMonth);
                showTimePicker();
            },
            readingDateTime.get(Calendar.YEAR),
            readingDateTime.get(Calendar.MONTH),
            readingDateTime.get(Calendar.DAY_OF_MONTH));
    datePickerDialog.show();}
1 usage
private void showTimePicker() {
    TimePickerDialog timePickerDialog = new TimePickerDialog(
            context: this,
            (view, hourOfDay, minute) -> {
                readingDateTime.set(Calendar.HOUR_OF_DAY, hourOfDay);
                readingDateTime.set(Calendar.MINUTE, minute);
                updateDateTimeDisplay();
            },
            readingDateTime.get(Calendar.HOUR_OF_DAY),
            readingDateTime.get(Calendar.MINUTE),
            is24HourView: false);
    timePickerDialog.show();}
```

Figure 5.2: Hba1c.Java time picker

```
2.java | Hba1c.java | Appointment_Reminder2.java | DateTimePickerDialog.ja
    });
}
1 usage
private void showTimePickerDialog() {
    final Calendar calendar = Calendar.getInstance();
    int hour = calendar.get(Calendar.HOUR_OF_DAY);
    int minute = calendar.get(Calendar.MINUTE);

    TimePickerDialog timePickerDialog = new TimePickerDialog(
            context: this,
            (view, hours, minute1) -> {
                selectedHour = hours;
                selectedMinute = minute1;
                updateTimeDisplay();
            },
            selectedHour,
            selectedMinute,
            is24HourView: false
    );
    timePickerDialog.setTitle("Select Reminder Time");
    timePickerDialog.show();
}
2 usages
```

<< **XP** team 2 code

Figure 5.3: Appointment_Reminder2 time picker

These duplicate methods weren't only missing some functionalities, but also caused violations of clean code principles, particularly the **DRY (Don't Repeat Yourself)** principle. Fortunately, we were able to address this issue effectively using the concepts learned in **Dr. Khaled's** Software Engineering course, especially the lessons on code smells detection & correction.

Our solution was to create a reusable **helper class** that encapsulates the logic for picking both date and time. This way, we could simply invoke methods from this class wherever needed, reducing duplication and improving code readability.

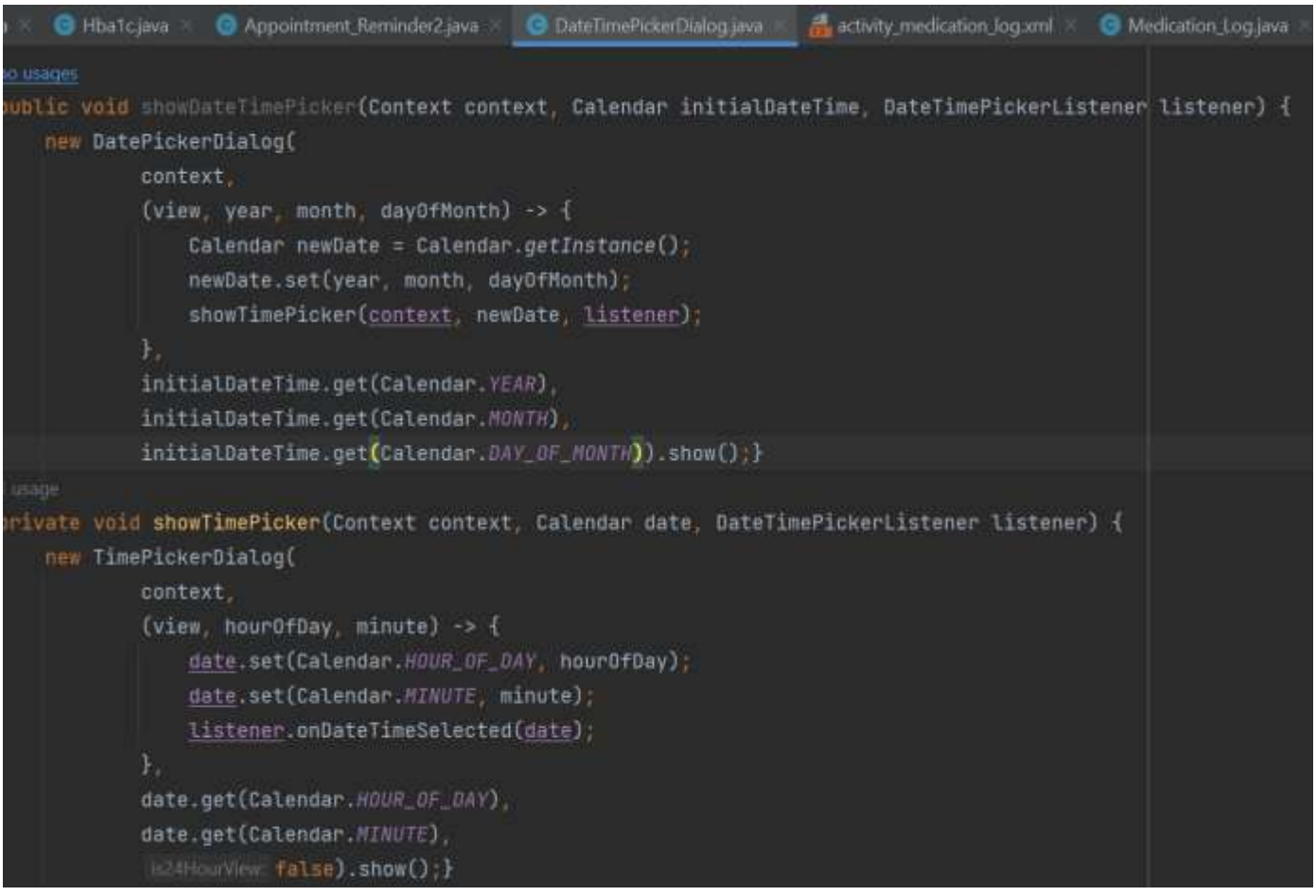


Figure 5.4: DateTimePickerDialog.java class

5.3 Benefits Gained from Studied Subjects

The implementation phase of **Viva Vital** has been significantly enriched by knowledge gained from several academic courses. Each subject contributed essential tools, techniques, or design strategies that were applied throughout development. The visual below, created using **Miro**, shows a brief of how each course contributed to the project, highlighting the multi-subject approach we followed.

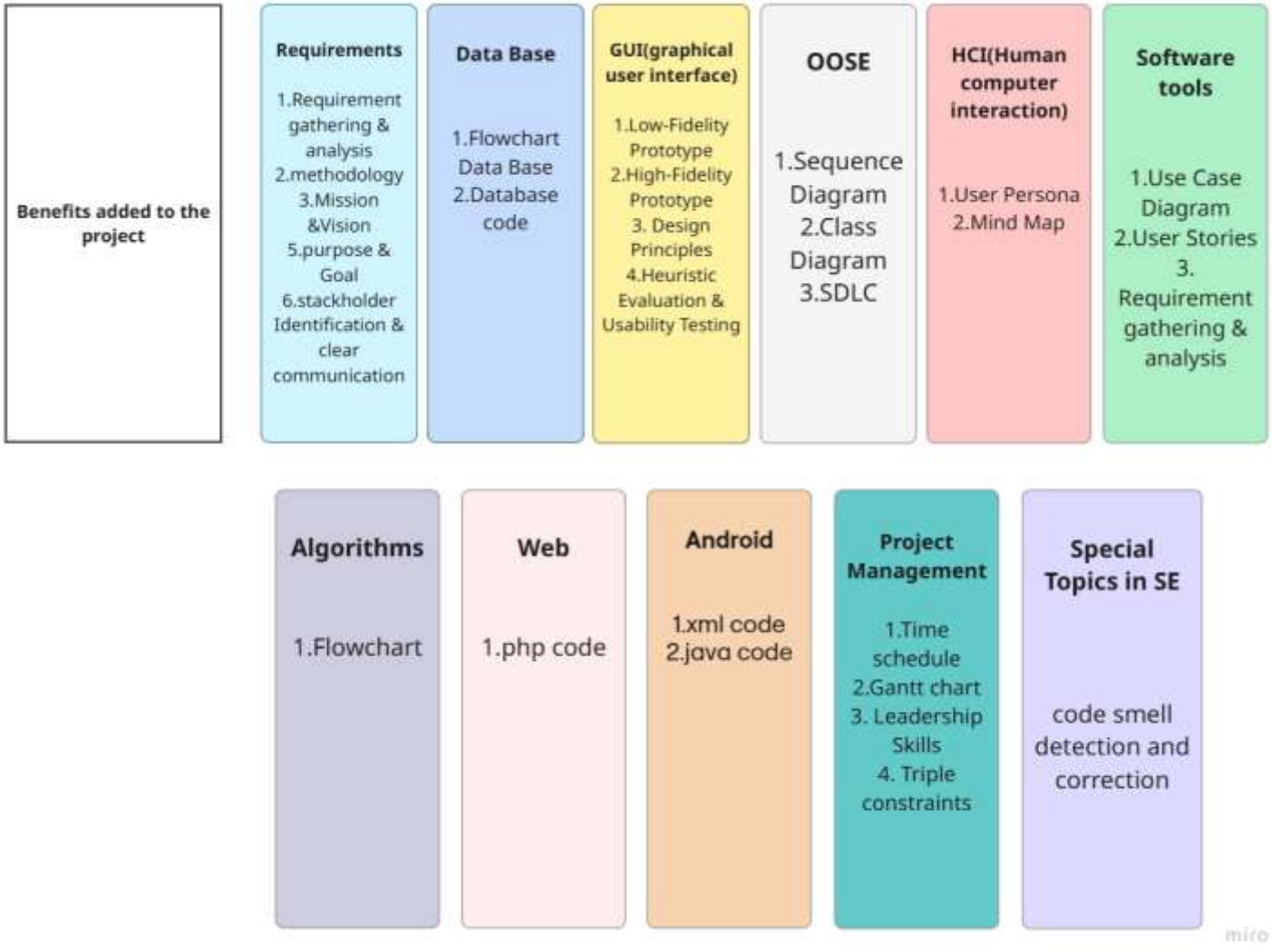


Figure 5.5: Subjects & their Benefits

5.4 Problem Solving

Figure 5.6: The Vitals way of problem solving

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