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Feminova – New Era of Women’s Health

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ABSTRACT

Feminova - A New Chapter in Women's Health. The new women's health app, Feminova, opens a window to women's health through a digitally designed environment for actual day-to-day use. Logging assures the perfect blend of easy and safe personal entry. Cycle information is organized correctly - in a tracker that over time understands the rhythm, shift, and pattern. Rather than relying on estimation, users are informed of the potential start days of the period and ovulation phases based on recorded dates. A clever assistant is embedded in the app, LLaMA2-powered and functioning offline to maintain the privacy of conversations. No internet search is required for body changes explanations. Misconceptions? They disappear more quickly when the facts are presented straightforwardly without the drama. Selected articles, not inundated ones, each one related to the health issues that women encounter, are accessible. Physical activity recommendations demonstrate that even minimal alterations in posture or everyday habits can lead to less pain. Support is readily available, and crisis numbers are present with one click if things get out of hand. In connection with the local community, the system stores users' data securely in a private data vault. Feminova, a product of smart learning mechanisms coupled with internet resources, is evidence of the amalgamation of technology with the personalized women's care of today's generation.

Keywords: Women’s Health, FemTech, Menstrual Cycle Tracking, Period Prediction, Ovulation Prediction, LLaMA2 Chatbot, Offline AI Assistant, Artificial Intelligence, Machine Learning, Predictive Analytics, Digital Health Platform, Reproductive Health, Health Pattern Recognition, Personalized Healthcare, Data Privacy, Secure Login, Local Data Storage, Myth Busting, Health Education, Lifestyle Recommendations, Crisis Support System, Digital Wellness, Smart Healthcare Solutions.

I. INTRODUCTION

Women's health has this incredible impact on the whole community's well-being however many women still find it challenging to get information about their health that is trustworthy, specific to them, and doesn't make them feel ashamed. Subjects like menstruation fertility changes in hormones, etc. are often kept secret or neglected. This leads people to the scattered and sometimes unreliable posts on the internet [1], [5], [7]. Now, with technology penetrating every aspect of life, what is more noticeable is the silent need for: -to-be clear-guidance; -to-keep data-private; -to-be easy to open; -and-to-feel-built-for-real-lives [2], [3], [19].

Feminova is at this point- and not in a loud way - as a connected website aiming at knowledge gaps through regular support and medical guidance integrated into everyday use by harnessing today's AI capabilities alongside internet-based facilities [2], [18].

First, the system hands- down secure user authentication is paired with menstrual cycle tracking. Soon after that, tracking additional to forecast the time of ovulation [1], [7], [14]. and the subsequent cycle. A virtual assistant powered by LLaMA2 responds with advice on personal wellness, by means of artificial intelligence [2], [4], [18]. Two questions reveal themselves first. Four follow closely behind. Eighteen more change-the-scenario. A few teaching tools debunk myths. Number five identifies one set. Selected wellness information completes it. A one-spot place for tips, fitness/movement support, then a crisis call - all in one place [3], [4], [19]. One-on-one touches meet powerful data [8], [10], [11], [12], [13], [15], [16], [17].

II. LITERATURE SURVEY

A. "How Private Is Your Period? A Systematic Analysis of Menstrual App Privacy Policies" by L. Shipp and J. Blasco (2020)

Taking a closer look, these period-tracking apps were challenged in this research for how they actually handle users' private information, raising the question to what extent their management practices were transparent. Unclear narratives about data processing emerged as the most dominant aspect of this, features difficult to understand and consent mechanisms that were poorly structured came along with this. The users usually got evasive replies riddled with promises and went disappointed that they got no straight answers. Even the settings/settings and permissions, which on the face of it looked like the places to raise awareness and dialogue, were framed in such a way that the users simply did not understand them. Information was lost at the junctures where openness was expected to be a given. What at first glance had looked like a mere device turned out to be a vehicle for complicated privacy issues. Just a handful of apps announced the availability of options before a user's decision was made. There were quite a few that hid major details in such a way that for one, it was horizontally at least time-consuming to uncover them, and secondly, it was not at all certain that they would be found at all by an average user. [13], [15], [16], [17].

B. "Real-World Applications of Symptom Tracking and Women's Health Data" by T. Adnan (2021)

Symptom-tracking apps, when analyzed closely, revealed that they assist women in identifying bodily changes. Consciousness is enhanced by daily record-keeping of patterns over time. With regular entries, it becomes a simple task to notice variations. For some, intentional documenting brings understanding. It is by recognizing the reference points over the course of several weeks that the understanding is obtained. Considering the eventual outcome, one finds that a better understanding of individual cycles is the result of tracking. It is as a result of the process of tracking that the woman is able to differentiate between the feeling of normal and the unusually. The recognition of patterns is the outcome of the process which, without the help of the pattern, would have gone unnoticed. Composing a diary of the symptoms is a good way to gain a better understanding of oneself. Self-noticing evolve into practical knowledge. Health consciousness gradually increases, with each individual recording. Besides that, for many, after a while, by way of observing the changes, they begin to understand the behavior of their cycle. Even with this, the notion that these apps can lead to improved health in the long run is still not backed by evidence. [1], [7], [14].

C. "Menstrual Tracking Apps, Fertility Algorithms and Intimate Behaviour Data" by S. Patel and M. Roy (2022)

Researchers have analyzed fertility prediction software in one aspect. They suggested that the source code should be made publicly available as a standard, but the actual tests of the fertility prediction algorithms in the real world never got to their papers. Their thoughts rather were just theoretical. [7], [14].

D. "Reimagining the Cycle: Interaction in Self-Tracking Period Apps" by B. Tylstedt et al. (2023)

This paper studied how user interface and user experience determine trust and engagement with menstrual apps. The paper did not verify the accuracy of medical data or the impact on health and well-being. [3], [14].

E. "Menstrual Cycle Management and Period Tracker App Use" by M. Hong et al. (2024)

Unexpectedly, the study revealed the appetite of the users for the features, the combination of progress monitoring and learning materials is a very important factor. It was based on the users' real comments, it preferred the use of surveys rather than the investigation of the system design or coding. Although the quantitative data was instrumental in forming the conclusions, the study was not technically hands-on [3], [5], [19].

F. "Evaluation of Menstrual Health Apps: Functionality, Inclusiveness, and Health Education" by E. Bucher et al. (2025)

The research was aimed at identifying the places where menstrual health apps' use of evidence-based information was limited, looking at them from the perspective of inclusion and accuracy. The versions considered were mere snapshots rather than live updates [5], [18], [19].

III. SYSTEM ANALYSIS

Most of the women health apps on the market today focus primarily on helping women track their menstrual cycles and do basic symptom logging. With the help of these apps, users can keep a diary of their period dates, moods or symptoms and get rough forecasts of their next cycles using average cycle-length calculations [1], [7], [14]. Some apps also provide fertility window estimation and information, but generally, such systems work as independent tracking tools without offering a comprehensive set of really helpful healthcare features. [3], [19]. Almost all existing solutions totally fall short when it comes to intelligent conversational support, structured myth clarification, exercise guidance, or centralized emergency resources all within a single platform [2], [4], [5], [18]. For privacy and transparency reasons, a lot of apps still depend on third-party cloud providers without explaining secure backend mechanisms for handling very sensitive reproductive health data adequately [12], [13], [15], [16], [17]. Generally, personalization is hardly more than simple cycle adjustments, which leads to low user engagement and diminished healthcare awareness [1], [7]. Feminova, the new system, is a safe and fully-featured web-based platform for women's healthcare management. Firstly, the system provides safe user registration and login through authenticated access and secure data storage; next, an interactive dashboard is displayed which connects different healthcare modules into one single, centralized interface. It has a period tracking feature that can be used to keep a record of menstrual history and to predict the days of the next period and ovulation by means of structured date-based calculations. [3], [5], [19].

An intelligent chatbot using LLaMA 2 and CTransformers allows users to have a healthy discussion on women's health issues through voice/text interaction. While ensuring privacy through local processing, such an AI can offer help and advice in a friendly manner. The main feature of the system is educational content that identifies myths, health articles that have been curated, gives guidance for exercise and overall wellness, delivers women youth-related news, and provides access to any emergency helpline. The proposed system by combining forecast sensitization smart help and secure local database management into a single platform significantly improves the level of personalization, protection of individual privacy and availability of digital healthcare for women. [18],[19].

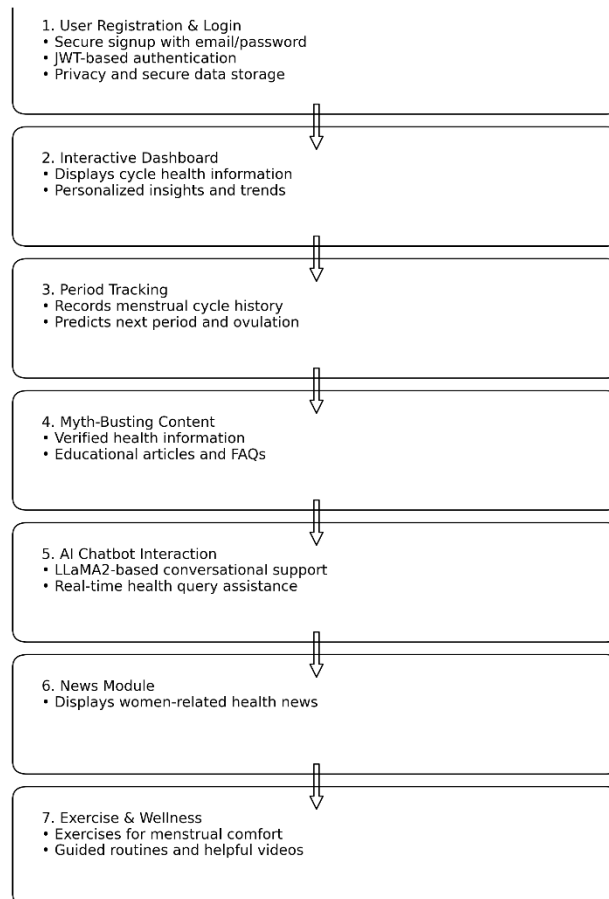


Figure 1: Flowchart of Feminova

IV. REQUIREMENT ANALYSIS

The main aim of requirement analysis is to determine and document the users' needs and expectations for a software system. It clarifies functional requirements, which tell what the system should do specifically. It also clarifies non-functional requirements that are related to aspects of performance, security, and ease of use. Besides, it also specifies what hardware and software will be required for the development and running of the system. Doing requirement analysis correctly leads to a common understanding between the different parties involved. Feature requirements need to be clearly detailed to avoid any confusion or disputes between the developers and the stakeholders. Without a doubt, it is the starting point for system design and implementation. Identifying the requirements clearly will allow the meeting of user expectations without wastage of resources. In short, without requirement analysis, one can hardly think of a software project being successful and reliable.

A. Functional Requirements: These are the features that the software must have in order to accomplish user goals. A few examples are login, data management, creating reports, finding information, and adding new content through APIs. Functional requirements specify the capabilities the system should have in order to fulfill the needs of the users. [1], [2], [7], [18].

B. Non-Functional Requirements: They indicate the system characteristics through which the performance, usability, and reliability aspects of the system are improved. Most important non-functional aspects are system security, response time scalability availability, maintainability, and user-friendly interface design. They make sure that the system remains efficient, secure, and reliable even when the conditions vary [8], [11], [13], [15], [17].

C. Hardware Requirements: Hardware Requirements Hardware requirements determine the actual physical components needed to support the program without flaws or bottlenecks. For instance, apart from other necessary equipment, one would ideally have at least 8 GB RAM, a capable quad-core processor, 500 GB space for storage, a stable internet connection, and standard input/output devices like keyboard, mouse, and display.

D. Software Requirements: Software requirements consist of the operating systems, development tools databases frameworks, and libraries needed for implementation. For instance, an operating system can be Windows or Linux, runtime environments for Python or Java, MySQL or PostgreSQL for databases, and web servers like Apache or Nginx.

In general, a thorough requirement analysis leads to a system that is functional, efficient, and scalable, fulfilling both user and technical expectations [2], [19].

V. METHODOLOGY

Methodology refers to the overall strategy or plan for carrying out a task effectively and efficiently. Similarly, software development methodologies act as guiding frameworks for designing, developing, and delivering software systems. They help in making the software development process transparent to all stakeholders measurable repeatable, and maintainable. A well-chosen methodology ensures alignment with business goals, user requirements, and technical constraints [3], [19].

At first, requirements gathering phase - collecting user requirements through interviews, questionnaires etc. - must be carried out thoroughly. It also includes studying and analyzing existing applications for deriving useful requirements. This is done to identify what users require both functionally and non-functionally. After that, system designing phase is done where architecture, data flow, user interfaces, database schemes etc. are decided. Visual aids like UML diagrams, flowcharts models, wireframes etc. help stakeholders understand the system being developed easily. [1], [7], [19]. Then comes coding phase where developers write source code using selected programming languages tools libraries keeping in mind programming conventions [2], [18].

Also, the developers emphasize on modular programming, i.e. creating independent software components for better testing and maintainability. When coding has finished, testing comes to help check whether the software works as expected, whether it is fault-free, meets performance targets, etc. Different testing strategies such as unit testing, integration testing, user acceptance testing are used to find and correct errors.

Lastly, deployment and maintenance phase consists of setting up the software on users' premises/environment followed by continuous support. Training users, producing documentation, delivery of spare parts (patches) etc. come under this final stage.

VI. SYSTEM ARCHITECTURE

The Feminova system operates on the principle of modular client-server architecture which is scalable, easy to maintain and can also offer user interaction in a very seamless manner. The overall structure was broken down into three major layers i.e. Presentation Layer, Application Layer, and Data Layer. Each layer was given its own set of duties, but they also worked together efficiently [3], [19]. Presentation Layer (Frontend): The Presentation Layer has a few functional modules: Signup Page: It allows new users to register by creating user ID and password also making sure that the required fields are properly filled in before submission. Login Page: It is used to authenticate the users and to limit access to secure areas through the use of a session control system [11], [17]. Dashboard: Works as a principal location from where the user can access different modules. It also gives health tips and helpline numbers to the user [1], [7], [14]. Period Tracker Page: Allows users to enter their menstrual details and see visually the predicted patterns for improving the awareness of reproductive health. Myth Busting Page: Implements the most suitable data structures to organize myths and facts, which aids in the verification of the truth. News Page: Provides the latest news, articles on women health issues regularly [2], [4], [18].

Exercise and Wellness Page: This page features step-by-step exercise routines aimed at easing menstrual discomfort and boosting overall wellbeing. It adds a hands-on wellness element to the platform. Chatbot Interface: Allows users to communicate their health queries. The LLaMA2-based chatbot creates human-like, on-topic replies for an engaging conversation [2], [4], [18].

On top of that, the frontend was completely remodelled by supercharge the backgrounds with crisp visuals with a colourful image or subtly animated video. The layout styling was also focused on changing the look and feel of the application to make it more delightful and easy to navigate. The Application Layer handles the business logic, user authentication, session management, and page routing. It's used for processing chatbot queries via locally deployed LLaMA2 inference endpoints and also carrying out menstrual tracking calculations [11], [13], [17]. In this sprint phase, apart from the conventional security measures, additional validation mechanisms were also introduced to support safe user interaction. The adoption of a modular structure facilitates the updating of individual components without necessitating a system-wide update. The Data Layer is responsible for the storage of user credentials, menstrual records, chatbot dialogues, and structured content data. The incorporation of database has led to organized data storage, better data integrity, and enhanced scalability [8], [10], [15], [17]. Besides controlled access and structured storage, various other security measures have been implemented to protect data. Since asynchronous requests are employed to communicate between layers, the resulting performance is smooth and the delay is minimum. Apart from the current local hosting, cloud hosting is planned for the future including secure HTTPS communication. Due to its layered architecture, Feminova achieves excellent flexibility, performance optimization, and scalability, and what is more amazing it is always breaking new grounds in women's health management.

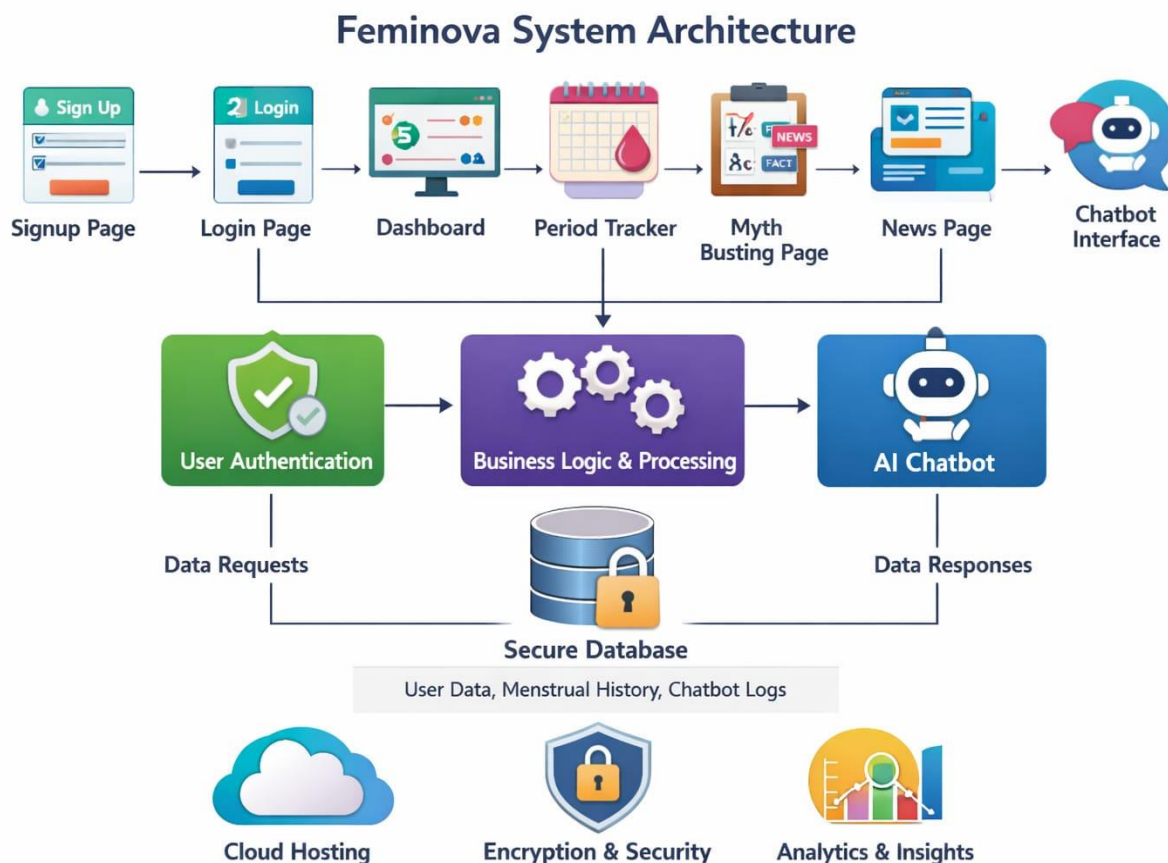


Figure 2: System Architecture

VII. RESULTS

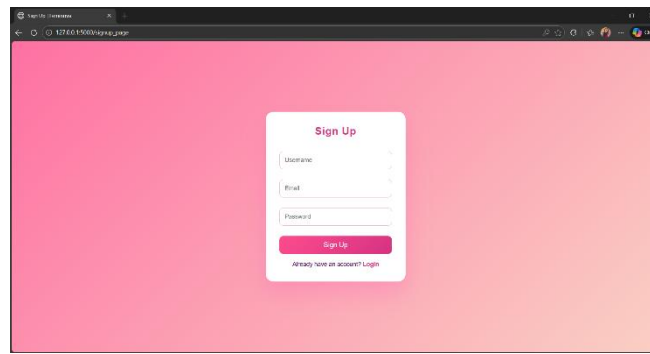


Figure 3: Signup Page

Create your account to begin your personalized health journey.
Enter your username, email, and a secure password to register.
The clean and simple interface ensures a smooth user experience.

Already registered? Easily switch to login with one click.

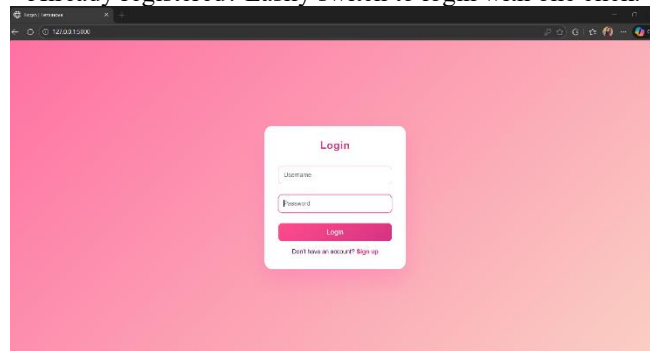


Figure 4: Login Page

Access your account securely using your username and password.
The minimal design helps users focus on quick authentication.
Smooth navigation allows easy transition to the signup page.
Designed for fast and hassle-free entry into the platform.

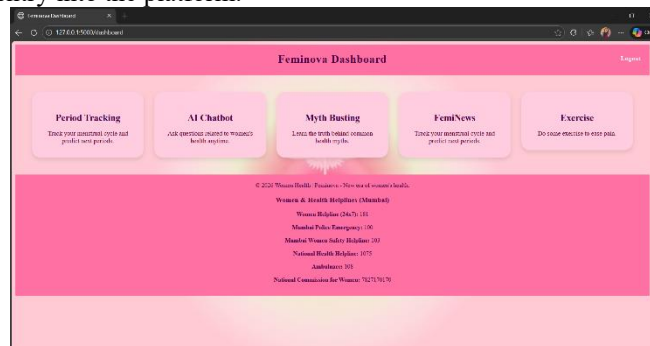


Figure 5: Dashboard

The dashboard offers multiple features in one organized view.
Users can explore period tracking, chatbot, myths, and more.
Each section is designed for easy navigation and usability.
Important helpline numbers are also provided for quick access.

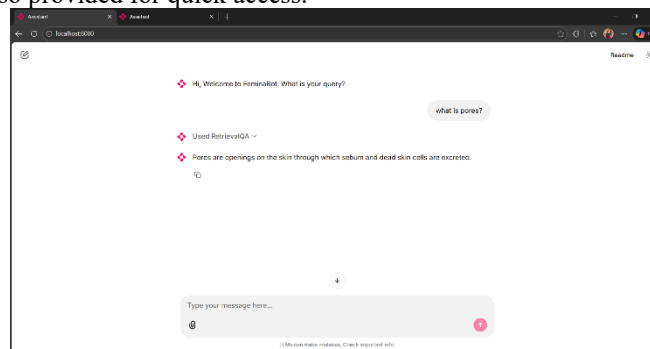


Figure 6: FeminaBot

Interact with the FeminaBot to get instant health-related answers.
The chatbot uses intelligent retrieval to provide accurate responses.
Users can type queries and receive clear, helpful explanations.
It ensures accessible and user-friendly health guidance anytime.

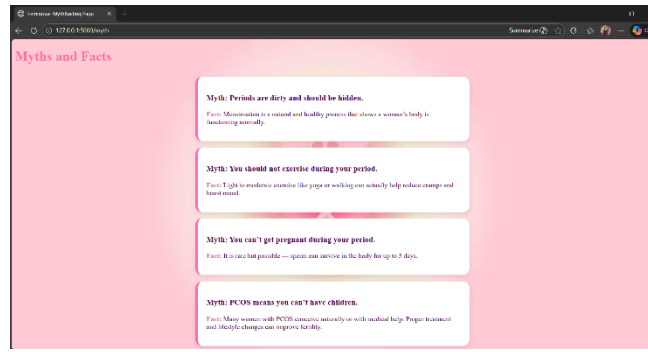


Figure 7: Myths and Facts

This page helps users distinguish between myths and real facts. Common misconceptions about women's health are clearly addressed. Each myth is followed by a factual, informative explanation.

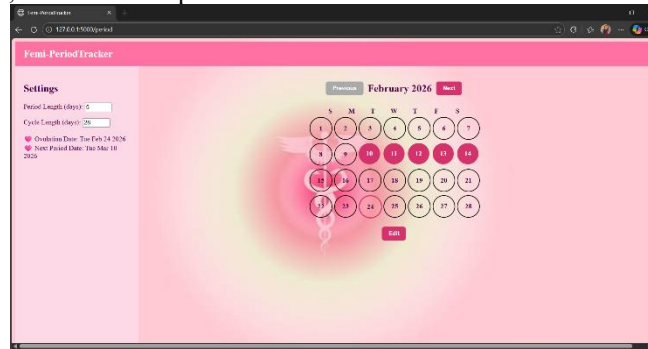


Figure 8: Period Tracker

This screen presents a menstrual cycle calendar with highlighted dates for period days and ovulation. On the left, users can customize cycle length and period duration in the settings panel. Important predicted dates such as next period and ovulation are clearly displayed for quick reference.

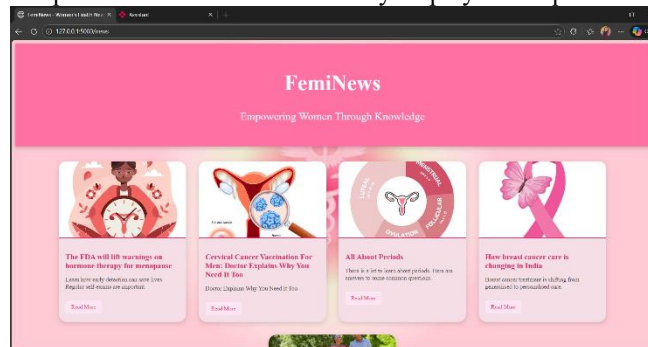


Figure 9: FemiNews

This page showcases a women's health news portal featuring informative articles on topics like menstruation and cancer awareness. Each article is displayed in a card format with an image, title, short description, and a "Read More" button.

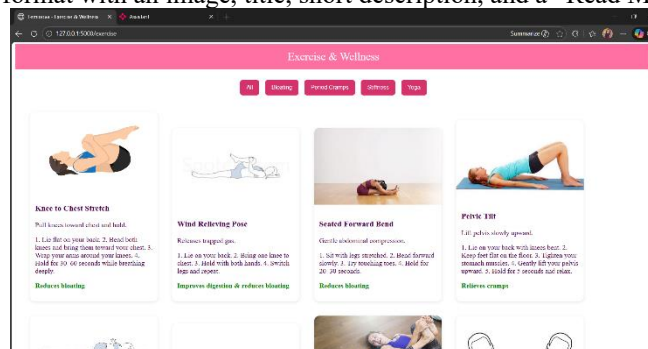


Figure 10: Exercise & Wellness

This page displays a wellness section focused on exercises that help with bloating, cramps, and body stiffness. It shows illustrated cards with step-by-step instructions and benefits for each pose. Users can filter exercises using category buttons like Yoga, Period Cramps, and Bloating.

VIII. FUTURE SCOPE

The present system can be further expanded and developed as a stand-alone program. Developing it as a mobile application for both Android and iOS platforms can be its most attractive feature as the users get to access the system anytime from anywhere. Cloud service integration will also help facilitate real-time data synchronization, safety storage, and multi-device access. This system will be a great tool for user experience and decision-making if it is personalized with AI-based recommendations or predictive analytics. It can even have multi-language interface support to cater to a wider audience.

Besides, a web-based application with responsive design which can run on different devices and browsers should be enough to deploy it. Features like getting notifications, working offline, and connecting with third party services through APIs can be part of future gradual changes. The underlying system architecture is such that it allows scalability, and hence, any new features or changing technologies will be quickly incorporated, making it an ideal system to be used as an application on a wide scale.

IX. CONCLUSION

In summary, building this system has been a great step towards realizing a complete and comprehensive solution that will effectively meet the user requirements that we identified. It has always been our focus not only to carry out thorough requirement analysis so as to design a system that can be implemented down to the last detail of work processes and will bring details of customer requirements to the users in a realistic way. Besides that meeting functional needs was equally important as non-functional needs, especially when it comes to ensuring our system's reliability, efficiency, and safety. The layered design of the system caters for the needs of scalability, maintainability, and the smooth functioning of the various layers, namely presentation, application, and data. Also, hardware and software specifications have been thoroughly thought through to yield the best possible results. The methodology we chose (requirements gathering design coding, testing, and deployment) is a reflection of our commitment to the systematic and very organized approach in the overall development process. Considering the high implementation cost of mobile technology at the moment in many parts of the world, particularly for a large number of developing countries, our system will allow for future improvements such as mobile deployment, cloud integration, and AI-powered features. This thereby makes it flexible and in synergy with user requirements that change and technological developments.

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