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Website with AI chatbot oriented around Menstrual health-Aartava

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Abstract
Aartava- menstruation in sanskrit.This project offers an end-to-end web-based platform that targets tackling menstrual health through regionally sensitive, environmentally friendly, and inclusive features. The centerpiece of the platform is a multilingual chatbot that responds to menstrual health questions while being respectful of the varied Indian linguistic and cultural contexts—something largely neglected by current solutions. The site also promotes sustainable behaviors by offering handpicked links to environmentally friendly menstrual product vendors and allowing users to monitor the environmental footprint of their existing non-sustainable behaviors. It is also an educational site, providing trusted information on menstrual health and hygiene. Through the combination of technology, social and environmental consciousness, this platform aims to shatter taboos, facilitate informed choice-making, and foster a transition towards sustainable menstrual habits in India.

1. INTRODUCTION

Menstrual health is a taboo and under-addressed issue in much of India, largely because of cultural taboos, lack of awareness, and limited exposure to reliable information. These hindrances lead to poor menstrual hygiene practices and long-term health consequences for menstruators.

Though there are some online tools to create awareness, they are mostly not localized—they are not linguistically accommodating nor regionally belief-sensitive. This usually causes a communication divide, particularly among rural and non-English-speaking communities.

Our project seeks to bridge this gap by a multilingual chatbot specifically tailored to respond to menstrual health-related queries. It is Indian culture-sensitive and allows for conversation in several regional languages, thus being more relatable and accessible.

Aside from awareness, the site also encourages sustainable menstrual habits. It connects the users to sustainable menstrual product suppliers and enables them to estimate the effect on the environment of non-sustainable products that they already use.

The website is also an educational site, providing easy and trustworthy information on menstrual hygiene. By integrating technology with health education and environmental sustainability, this project hopes to equip menstruators in India with information and tools necessary for empowerment.

2. METHODOLOGY

Part A: Chatbot fine tuning

To develop the menstrual health chatbot, the project employs Botpress, an open-source conversational AI platform known for its modular architecture and visual flow builder. This platform facilitates the creation of structured, user-friendly dialogues tailored to address menstrual health topics effectively.

Recognizing the linguistic diversity of India, the chatbot is designed to be multilingual, supporting regional languages such as Hindi, Tamil, Kannada, and others. Botpress's integration capabilities with translation APIs enable real-time language translation, ensuring that users receive accurate information in their preferred language, thereby enhancing accessibility and user engagement.

The chatbot's conversational flows are meticulously crafted to be context-aware and culturally sensitive, addressing prevalent myths and misconceptions surrounding menstruation. By customizing intents and entities within Bot press's Natural Language Understanding (NLU) engine, the chatbot can recognize and respond to region-specific queries, providing factual and empathetic responses that resonate with users' cultural contexts.

To accommodate users who may have difficulty articulating their concerns, the chatbot incorporates fallback mechanisms and guided conversation flows. These features assist users in navigating the chatbot's functionalities, directing them to relevant FAQs, human support links, or external resources based on their inputs, thereby ensuring a seamless user experience.

Similar methodologies have been employed in projects like Foodbot[1], which utilized a knowledge graph and just-in-time interventions to promote healthy eating habits, and CHARLIE [2], which provided health coaching through conversational agents to support lifestyle modifications.

Mai [10], a chatbot that educates south asian people about menstrual health is well performing , but its drawbacks lie with respect to the Indian audience where it is not trained for India's regional languages

Part B: Environmental impact calculator

This project module estimates the environmental impact of disposable sanitary napkins based on a formula-based model that considers both carbon footprint and plastic waste. The model gathers input from users on three parameters: the daily number of sanitary pads consumed (N), the number of menstruation days in a cycle (D), and the number of cycles in a year, taken as 12 for yearly estimation.
The total amount of pads used each year is first calculated as:

$$\text{Annual Usage} = N \times D \times 12$$

There is an average carbon emission factor (E) and average plastic weight (P) per pad. Using results from prior life cycle assessment (LCA) research, E is assumed as 0.03 kg CO_2e per pad and P as 4.5 grams of plastic per pad [3][4].

The environmental footprint is then estimated as:

Annual CO_2 Emissions (kg)=N×D×12×E
Yearly Plastic Waste (kg)=N×D×12×Px1000

In order to facilitate better understanding and promote behavior change, the figures are not only reported as raw numbers but also interpreted with qualitative analogies. For instance, the amount of plastic waste produced can be compared to the number of plastic supermarket bags thrown away every year, whereas carbon emissions can be likened to miles traveled by a typical gasoline car.

In addition, the calculator cites decomposition timelines to highlight sanitary pads' long-term environmental lifespan of about 500 to 800 years. The long-term impact is graphically represented to drive home awareness. Through a combination of both quantitative and interpretive approaches, the calculator is able to drive awareness of menstrual waste and prompt switch to environmentally friendly alternatives.

C. Eco friendly product display

The project includes a carefully selected display of popular Indian sustainable menstrual product brands like reusable cloth sanitary pads, menstruation cups, and biodegradable sanitary pads. All these products are selected based on sustainability criteria and affordability for the Indian market in order to promote more sustainable menstrual health choices.

Product details such as descriptions, prices, and customers' reviews are displayed with links to shop online directly, making it easy for users to access and compare sustainable options easily. The website is multi-lingual in the sense that it accommodates the Indian languages it caters to, making it more accessible and inclusive to different user groups.

This combination of learning and easy availability has been able to successfully stimulate ecologically favorable consumption behavior within the developing world, bridging the gap between awareness and implementation. With this convergence of these parameters, the project allows menstrual hygiene sustainability through pragmatic, informed decisions.

D. Integrating to form the website

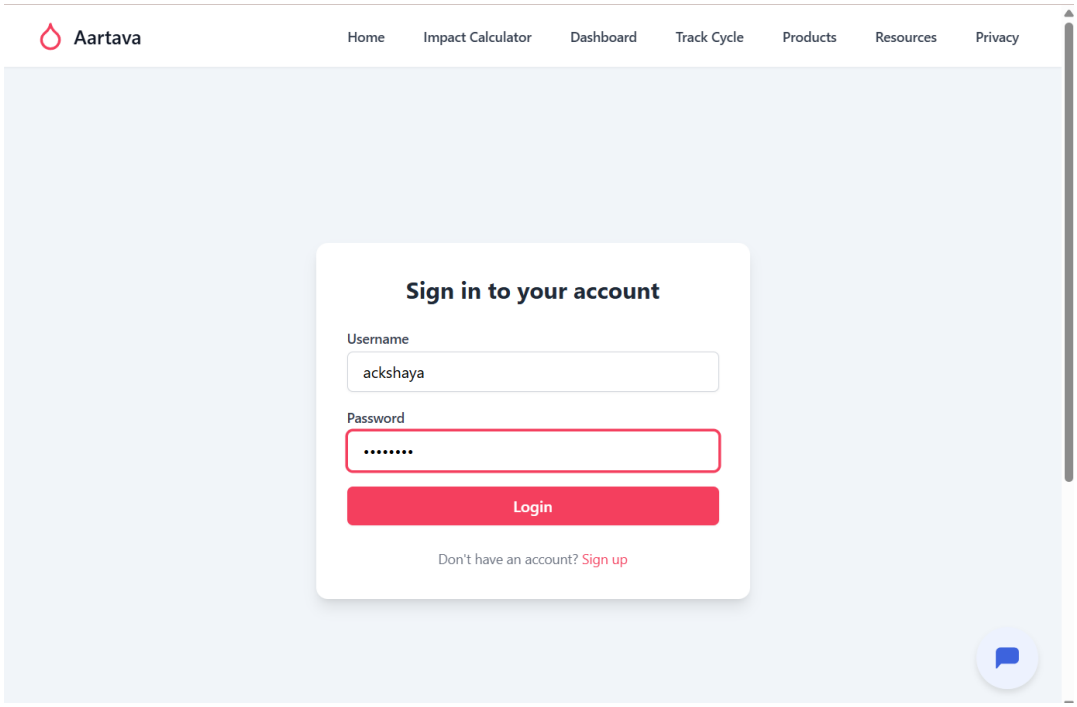
The project unifies the chatbot, environmental impact calculator, and green product showcase into an integrated web platform. The frontend is implemented through React, offering a dynamic and adaptive user interface that accommodates multilingual conversation and interactive visualizations. React's component-based architecture allows for modular development and effortless integration of chatbot conversations, impact responses, and product listings.

The backend is developed using Node.js, which processes API requests, data processing, and controlling communication between frontend elements and databases. Microsoft SQL Server Management Studio (SSMS) is the database system, where user inputs, product details, and environmental data are stored securely and efficiently.

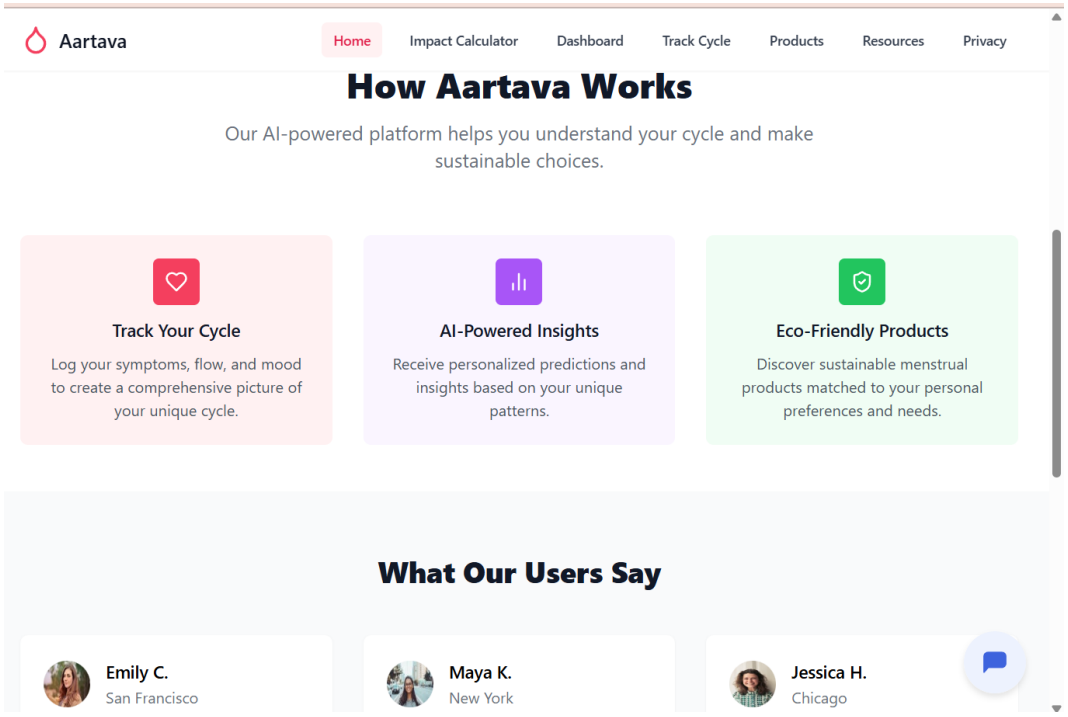
The chatbot feature, which was optimized with Botpress, interfaces with the backend through RESTful APIs for real-time conversational responses. Likewise, the environmental impact computations are computed on the server to provide accuracy and rapid feedback. Product information is retrieved and updated dynamically from the database to provide up-to-date availability and pricing.

This structure allows seamless integration of all features, providing a cohesive user experience that informs, converses, and encourages users to adopt sustainable menstrual health habits.

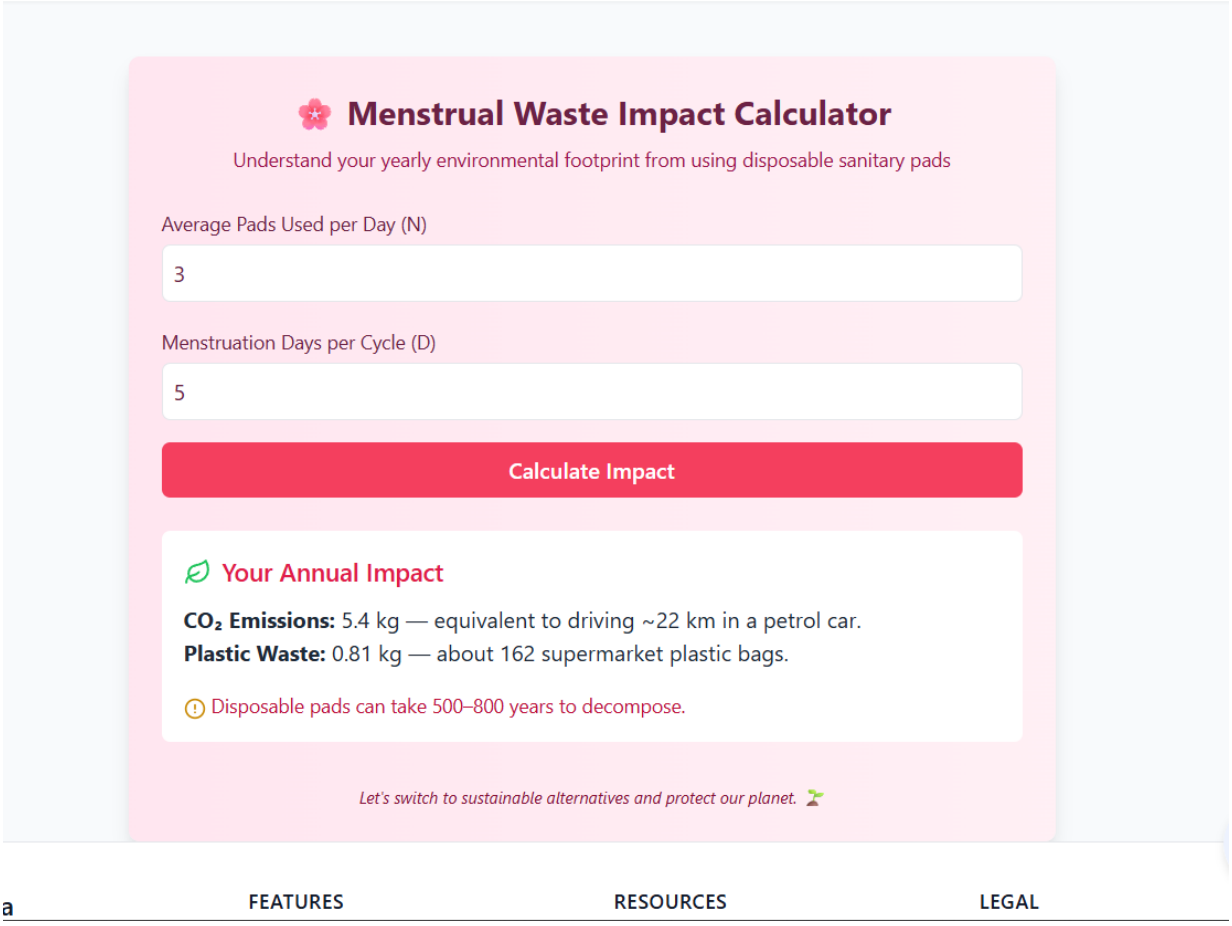
3. RESULTS



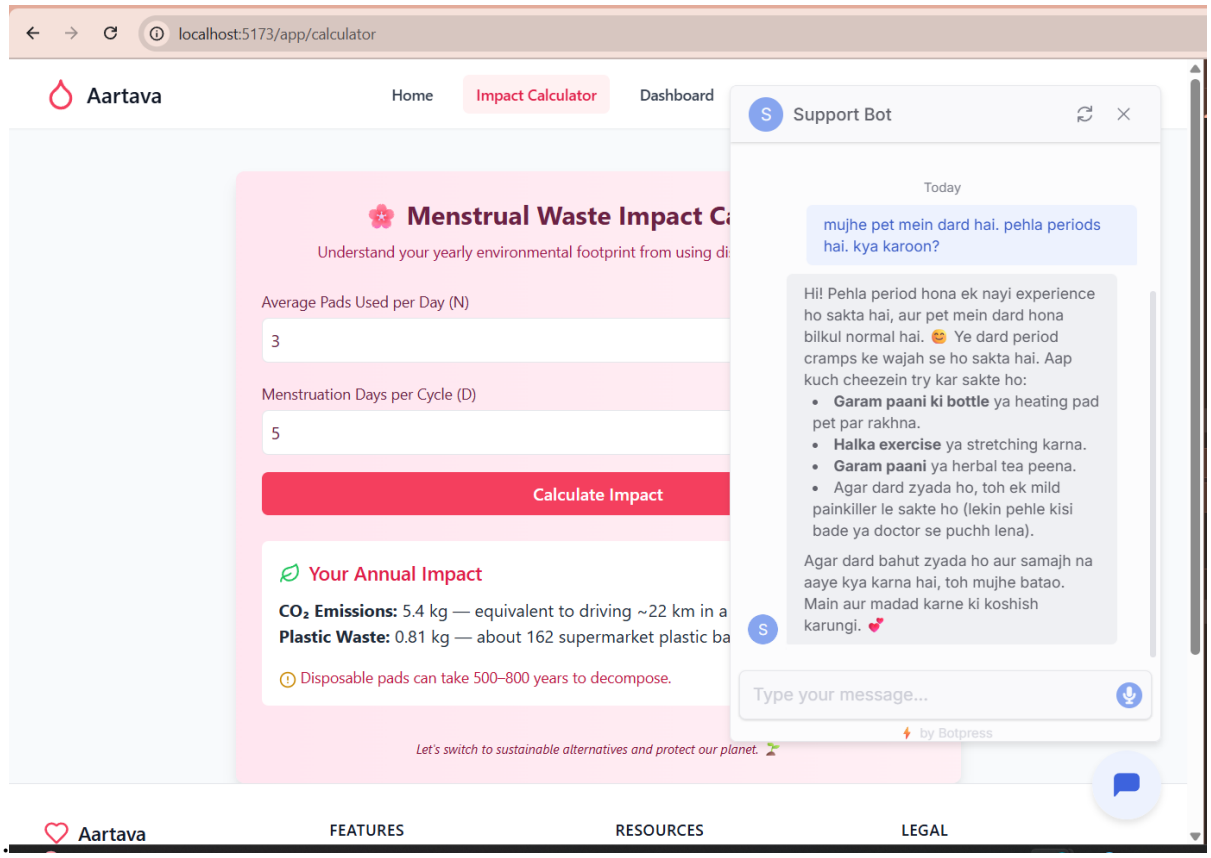
This is the sign in page



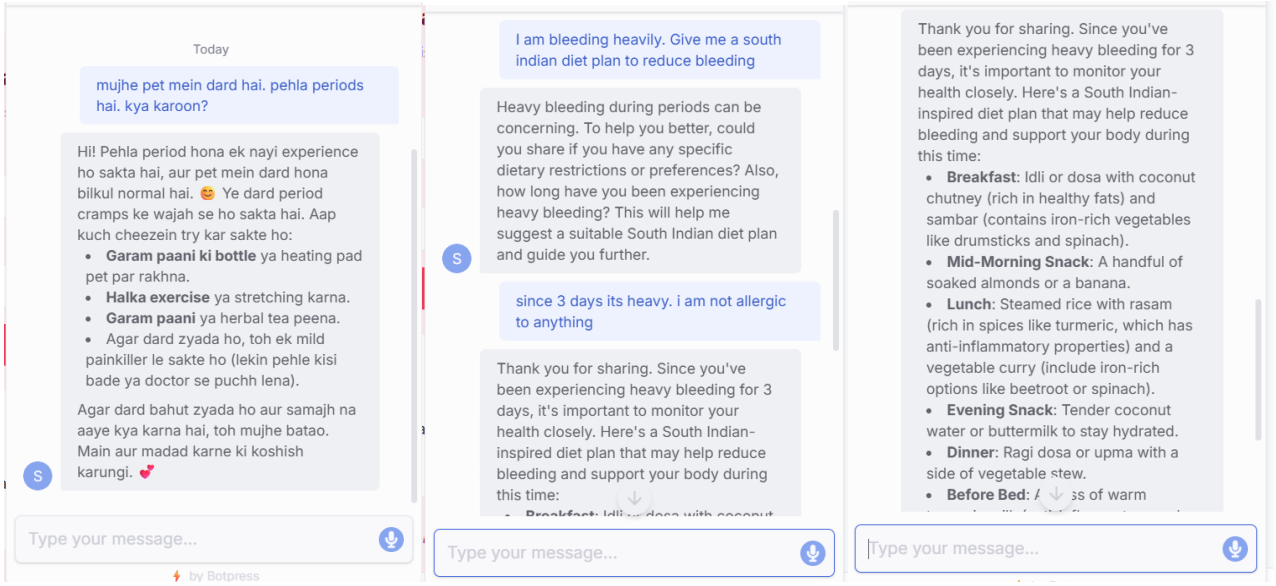
home page : from here , user can navigate various pages for environmental impact calculation, tracking cycle, checkout on products available and also chat with our chatbot

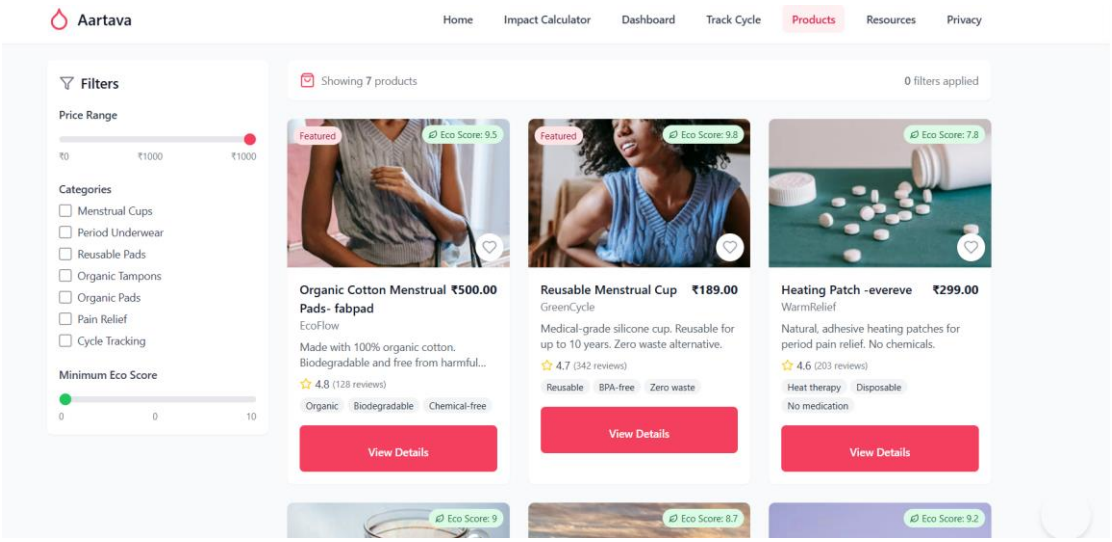


This page is dedicated to spreading awareness about the environmental impact of using non eco-friendly menstrual products . Since users can't understand CO2 emissions in mere numbers, the report compares it with two examples for better understanding

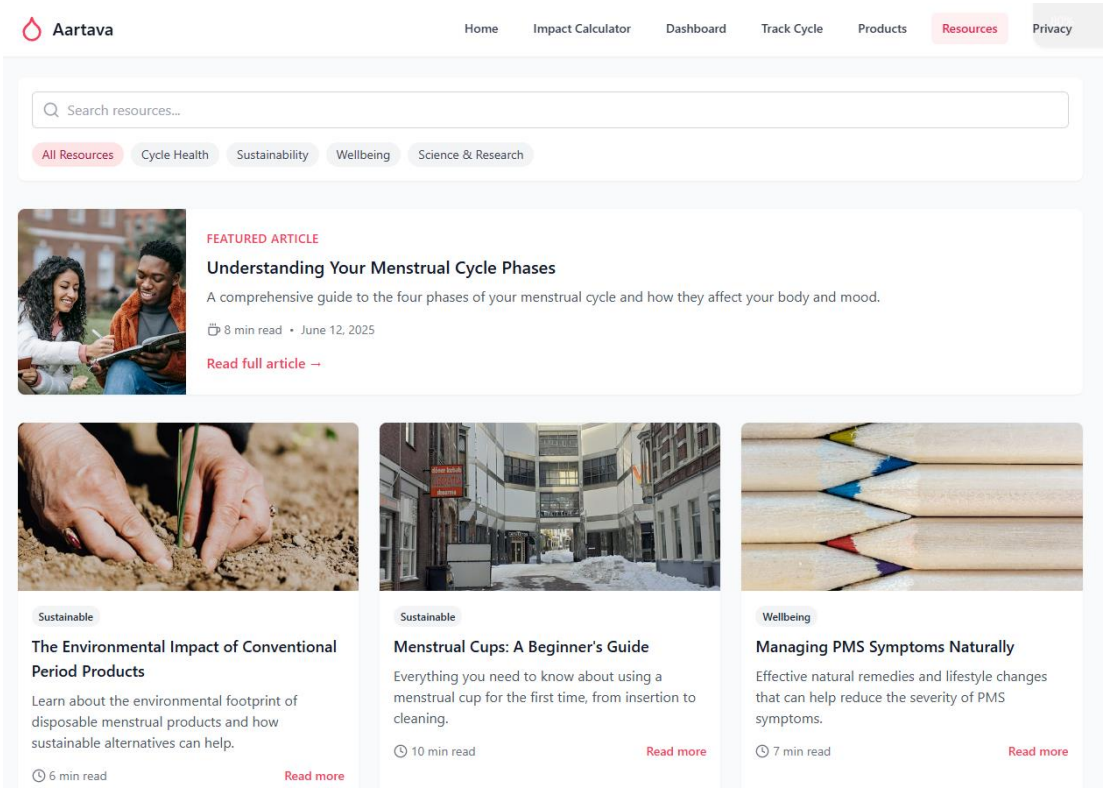


The icon on the side is provides the interface to access the chatbot





This page displays the products in the given price range.



This page provides study resources on a given topic.

4. FUTURE WORK

i. Multilingual Language Support : Adding in additional regional languages for world wide and dialects around the world

ii. Voice Interface Integration: Implementing voice-based interactions to improve accessibility for users with limited literacy or visual impairments.

iii. Interactive Community Features: Enable local community users to utilize the platform for group education sessions.

iv. Economic Accessibility Platform : Exploring partnerships with manufacturers and NGOs

v. School Integration: Developing specialized modules for educational institutions to support structured menstrual health education.

5. CONCLUSION

Aartava represents advancement in addressing menstrual health challenges in many ways through culturally-sensitive education, environmental awareness and sustainable promotion . This project mainly focuses on a holistic approach engaging with users by efficiency and improved health practices with environmental responsibility. The platform effectively connects cultural and linguistic gaps to deliver sensitive health information, showing the power of thoughtful digital tools. It also reveals how awareness of environmental impact can drive interest in sustainable health choices . By fusioning in tech innovation with cultural sensitivity and personal health problems with eco - awareness which is more scalable for tackling menstrual health with other sensitive health issues along with coming across diverse communities . It supports and encourages personal choices , community engagement and empowers individual women and in different diverse contents as well

REFERENCES

1. Foodbot: A Goal-Oriented Just-in-Time Healthy Eating Interventions Chatbo Philips Kokoh Prasetyo, Palakorn Achananuparp, Ee-Peng Lim https://doi.org/10.48550/arXiv.2009.05704
2. D. Chowdhury, A. Roy, S. R. Ramamurthy and N. Roy, "CHARLIE: A Chatbot That Recommends Daily Fitness and Diet Plans," 2023 IEEE International Conference on Pervasive Computing and Communications Workshops and other Affiliated Events (PerCom Workshops), Atlanta, GA, USA, 2023, pp. 116-121, doi: 10.1109/PerComWorkshops56833.2023.10150359. keywords: {Pervasive computing;Schedules;Obesity;Conferences;Chatbots;Market research;Task analysis;e-Health;Fitness;Diet;Deep Learning;Feed-Forward Neural Networks;Recommendation Systems},
3. Fourcassier, Sarah & Douziech, Mélanie & Pérez-López, Paula & Schiebinger, Londa. (2022). Menstrual products: A comparable Life Cycle Assessment. Cleaner Environmental Systems. 7. 100096. 10.1016/j.cesys.2022.100096.
4. Kattimani V, Alekhya DLD, Pathralapati S, Sojin SS, Patel S, Prabhakar C, Dixit H. Knowledge, Attitude, Perception and Practices towards Disposal of Sanitary Napkins among Young Females: A Cross-Sectional Study. J Pharm Bioallied Sci. 2024 Feb;16(Suppl 1):S637-S640. doi: 10.4103/jpbs.jpbs_908_23. Epub 2024 Feb 29. PMID: 38595402; PMCID: PMC11000925.
5. Olabiyi, Winner & Roth, Joseph & Henry, Elizabeth. (2024). Carbon Footprint Awareness Author. Research Gate 2024
6. Davile M, Gangane N, Khan MF, Dange S, Mundle S. Exploring Menstrual Hygiene Practices and Awareness of Menstrual Cups Among Nursing Professionals: A Cross-Sectional Survey. Cureus. 2024 May 27;16(5):e61179. doi: 10.7759/cureus.61179. PMID: 38933610; PMCID: PMC11205264.
7. P. Singh and M. Joshi, "Bridging Awareness and Accessibility: Promoting Eco-Friendly Menstrual Products in Developing Countries," Environmental Health Perspectives, vol. 130, no. 5, pp. 057002, 2022. https://doi.org/10.1289/EHP9353

8. Singh, Usneek & Vora, Nisarg & Lohia, Punit & Sharma, Yashvardhan & Bhatia, Ashutosh & Tiwari, Kamlesh. (2023). MULTILINGUAL CHATBOT FOR INDIAN LANGUAGES. 10.13140/RG.2.2.30993.20325.
9. MenstLLaMA: A specialized large language model for menstrual health education in India View ORCID ProfileProttay Kumar Adhikary, Isha Motiyani, Gayatri Oke, Maithili Joshi, Kanupriya Pathak, View ORCID ProfileSalam Michael Singh, View ORCID ProfileTanmoy Chakraborty doi: https://doi.org/10.1101/2025.01.22.25320466
10. Mai: A Transformer Based Domain Specific Chatbot for Menstrual HealthAuthors: Shafaq Fatima Mughal, Shayan Aamir, Abdul Samad, Umema Zehra, Ayesha Asif SyedAuthors Info & Claims ACM Journal on Responsible Computing, Volume 2, Issue 1 https://doi.org/10.1145/3711711