

Requesting Section: EAPRO Gender Section

TITLE: Building out period tracking engine for Oky, a mobile period tracker for girls

1. Background

Oky is a tool to support adolescent girls to manage their period with normalcy and confidence, through evidence-based information on menstrual health and hygiene and individual period cycle tracking. Available on both Android and iOS and originally developed by UNICEF East Asia Pacific Office, Oky enables girls to take control and plan for their periods and their lives.

Oky helps girls to learn about menstruation in fun ways and distinguish myths from facts and promotes positive attitudes towards menstruation. Oky's aim is to transform stress and shame into empowerment. It provides girls with accessible, relevant information about menstruation, as well as a period-tracking tool to help girls get to know their own bodies. The app is designed to be fun and engaging to counteract often negative feelings girls have around their periods. Oky is the first period tracker app created with and for adolescent girls to make learning fun. Key features of Oky include a gamified design for girls (10-19 years); avatars and personalized interface; period and body positive; evidence-based information in girl-friendly language to learn in entertaining ways; challenging gender stereotypes and heteronormativity, celebrating diversity; localized in national languages and to local context.

Girls' digital realities require tailored technology: a light-weight app for low end phones; offline functionality for low connectivity settings; multiple user login and password protection for girls sharing phones; read-out function, tutorials, help for low (digital) literacy or vision impairment; downloadable via the website or App Store/ Play Store; strict data protection. Girls will never be charged to download or use the app; Oky will not be commercialized, there will be no advertising on the platform. Oky also follows strict privacy and data protection mechanisms, and girls' personal data will never be accessed or seen by anyone; it is only stored locally on the device. These privacy and data protection mechanisms will need to be adhered to at all times by any vendor.

The app (and CMS) software and content is open source. This means everyone can utilize the Oky code and content with no development or licensing costs, which is available on GitHub. It can be built out, adapted, and utilized, by girls and franchise partners around the world. The mobile application is written in ReactNative, as a single code base for both iOS and android apps. The first iteration of the global Android version of Oky went live in 2020 on the global Play Store as well as localised versions of the app in the two pilot markets of Mongolia and Indonesia. The global English iOS version was released in 2021. Oky is now being deployed in new markets through franchise partners who localise, adapt and deploy the open-source content. New markets for 2021 include Kenya, Mexico and India.

Once the prediction engine is merged onto the main code repository on GitHub, all the implementing franchise partners who have access to the code will be able to pull the new code changes and release a new version of their localised app with the intelligent prediction engine.

More reading is available on the Oky website: <https://okyapp.info/>

2. Objectives, purpose and expected results from assignment

In order to improve the user experience, UNICEF requires the period tracking prediction engine to be rebuilt. The current period tracker uses a rule-based algorithm to monitor and predict periods. In order to improve the experience, especially for those users that have irregular periods, an intelligent prediction engine is required. All possible user inputs/interactions from the app will be specified prior to the commencement of the work. All code produced by the vendor will be pushed to the Oky GitHub repository.

The specific objectives of the assignment are to:

- build an intelligent period tracking prediction engine, ensuring that Oky continues to work both online and offline, and that the app remains lightweight for low-end phones.
- integrate the period tracking prediction engine into the Oky app. This includes connecting it to the calendar, daily cards and cloud wheel.
- ensure that the necessary data points are collected from users to continue improving the engine but also that Oky's privacy and data protection principles remain in place.
- display meaningful error messages when required.
- configure the backend to host the prediction engine.

3. Description of the assignment

Build an intelligent period tracking prediction engine

The vendor is expected to build an intelligent prediction engine that can predict the start date and duration of the periods of Oky users. The engine should be able to predict, to a high level of accuracy, both regular and irregular periods. The prediction engine should pause if periods are irregular, and have the ability to restart the predictions again later on. The vendor will work with the Oky technical team to define what is 'too' irregular (and at what point the engine does not offer the user any predictions). In addition, the engine should be able to adjust future periods based on all the historic data points of a user. The vendor will need to include, as part of their work, a robust dataset that they use to train and validate the engine, and which adheres to Oky's data protection and privacy policies and processes. The choice in the technique (i.e.: recurrent neural network) implemented is left to the discretion of the vendor but the approach will need to be approved by the Oky technical team before development commences.

Ability to work offline and remain lightweight

The successful vendor needs to ensure that Oky users can continue to track their periods and use the app even when they are offline. Many current Oky users have low-end phones so the vendor needs to ensure the app will remain light even after the intelligent prediction engine is integrated within the product. The vendor is required to implement a solution (such as a hybrid approach) that ensures the size of the app remains small and the app speed is not significantly impacted.

Integrating the period tracking prediction engine with the global English Oky apps

The prediction engine needs to be integrated within the Oky global English Android and iOS apps. As the code is written in ReactNative both apps share the same code, but smooth integration with both apps is essential. The engine should be connected to the calendar, daily cards and the cloud wheel. Any changes made to the menstruation status from any of these three input points should adjust the predictions and reflect across the app screens. For instance, changing the state from no-period to period day on the cloud wheel should adjust the current and future menstruation cycles and this should be reflected both on the calendar and the daily cards.

The possible user interactions/input will be specified by the Oky technical team prior to commencing the work. This deliverable will be done in collaboration with the Oky tech team, where the Oky team will lead the user's app interfacing, whilst the bidding vendor will deliver the prediction engine itself and connect it to the mobile applications.

Ensuring the necessary data points are collected

To continue improving and refining the period tracking engine over time, it is important that relevant user data is captured. The vendor should propose the prediction engine inputs and adjustments that need to be captured. Only the essential user data and interactions are to be stored and all data anonymized.

Displaying meaningful error messages when required

Appropriate error messages should be displayed on-screen when the user attempts an invalid operation such as entering data into daily cards in the future. The content of the error messages should be clear and concise so that any user can easily understand it - all copy will need to be approved by the Oky technical team, and delivered in a separate document as well so that they can be translated by franchise partners who may integrate the revised prediction engine into local Oky versions. The UI used to convey the error messages should remain the same and not be altered.

Configure the backend to host the prediction engine

The backend needs to be robust to be able to support a high number of API calls. The vendor will work alongside the Oky global tech team to ensure the backend is configured correctly and can be easily maintained by the Oky team. Oky currently runs in Kubernetes, but if the vendor wishes to implement a serverless function or any other solution, this can be discussed with the Oky technical team and the global tech vendors. The vendor will provide appropriate and detailed documentation regarding the configuration as part of this deliverable.

4. Deliverables

- An intelligent prediction engine that is capable of adjusting menstruation predictions based on current and past data points for a particular user. The engine should also be able to predict to a high level of accuracy the cycles for those users with irregular periods.
- All approved code to be pushed to Oky repository on GitHub.
- Integration of the prediction engine with the Oky app (on iOS and Android).
- Code documentation, adjustment of README on GitHub, and detailed project documentation.
- Step by step documented guide of backend configuration.
- Set up automatic generation of monthly reports that check accuracy of the prediction engine (for instance using the historic data as the training set and the new monthly data as the test set)

5. Reporting

The service provider is required to provide thorough documentation of each task and minutes of meetings. Regular interactions with and provision of updates to the Oky core team and the global tech vendor are expected.

6. Location and duration

- Indicative start date for the assignment will be August 2021, with the contract spanning a four-month period with completion by December 2021.
- The services provided are to be based at the offices of the successful vendor with regular virtual meetings with the Oky core team. It will require regular collaboration with the Oky team (calls, email, Slack, GSuite for example) who are based in Kuala Lumpur, Delhi and the UK, and so flexibility with time zones is required.
- No travel is anticipated.

7. Qualifications and experience

For this assignment UNICEF requires a service provider with team members that have, as a team, the following qualifications or experience:

Mandatory

- Robust experience delivering AI solutions for mobile apps.
- A data scientist on the team who has specific experience building intelligent prediction engines.
- Experience setting up and configuring a backend.
- Experience in developing, refining and maintaining an Artificial Intelligence solution and relevant technical skills.
- Project management experience.
- Experience in the digital healthcare sector. Experience in femtech strongly preferred.
- Experience working on digital products for adolescent girls in emerging markets.
- Fluency in spoken and written English.

Desirable

- Experience working in Agile methodologies is preferred.
- Experience developing digital products and services for low internet connectivity settings is a plus.
- Experience with period tracker apps is a plus.

8. Evaluation process and methods

UNICEF will evaluate each bid for compliance with the mandatory requirements of this RFQS. Failure to comply with any of the terms and conditions contained in this RFQS, including provision of all required information, may result in a bid being disqualified from further consideration.

Secondly, UNICEF will evaluate bids for compliance with the technical requirements stated below and undertake a commercial evaluation. UNICEF will award the contract to the bidder providing the lowest priced technically compliant bid.

Technical evaluation criteria (pass / fail)

Company Profile
<ul style="list-style-type: none">● Company services and expertise delivering AI solutions for mobile apps● Previous clients and projects in digital healthcare (femtech preferred) and digital products for adolescent girls● Expertise of key team members including data science for intelligent prediction engines, project management
Experience with similar projects and customer references from projects of similar scope and complexity
<ul style="list-style-type: none">● Clients with similar types of work assignments.● AI solutions and intelligence prediction engine projects undertaken during the last 5 years● References from past assignments.
Technical capacity
<ul style="list-style-type: none">● Data scientist on team● Experience in delivering AI solutions for mobile apps● Experience in building intelligent prediction engines● Experience in setting up and configuring a backend● English language requirement.

9. Administrative issues

- Bidders are requested to provide a technical bid in Annex C – Technical bid response form.
- Bidders are requested to provide a cost bid in Annex D – Financial bid response form.
- Bidders are requested to complete the list of daily rates per role, in case additional services are requested beyond the scope of this RFQ (kindly refer to 2nd tab of Annex D).
- Bidders are requested to provide an all-inclusive cost in the financial bid. Bidders are reminded to factor in all cost implications for the required service/assignment.

10. Payment Schedule

- The payment schedule is based on completed deliverables.
- If the bidder wishes to propose an alternative payment schedule, it must be included in the financial proposal. The final payment schedule is to be reviewed and agreed with UNICEF.
- Payment terms 30 days net upon receipt of approved invoice.

Payment of fees will be made as follows:

- 25% upon submission of work plan
- 25% upon successful integration of the prediction engine with the Oky app
- 50% upon delivery of all agreed and signed-off deliverables

11. Any other information

All software services provided under this contract with UNICEF shall consider the following special terms and conditions that UNICEF commonly upholds its vendors to in projects:

Agile development

- The design and software development process shall include regular check-ins to re-assess progress, check priorities and adapt specific details. However, all of the contracted features to be implemented within the agreed timeframe.
- Publicly visible (to UNICEF and Oky team and partners) roadmap and development priorities
- Project management (i.e. using tools such as Redmine, Trello, Jira, etc.)

Full source ownership

- Source code fully owned by UNICEF.
- Documentation, testing and frequent commitment of all code to UNICEF and/or to appropriate online repositories such as GitHub

Test coverage

- Automated testing of the overall system, including provision of unit tests for all source code that can be included on the integration build server. Near total test coverage for all code is required.
- Performance and scalability
- Repeatable testing of system performance to ensure scalability, including automated detailed performance measurement of all software modules under stress-test conditions.
- Unit testing, user acceptance testing and integration testing must be thoroughly documented. User Acceptance Testing (UAT) will be signed off by the respective stakeholders as acceptance of deliverables
- Accuracy testing - Validation of the accuracy of the model. Detailed report which includes comparison of predicted values vs obtained values to be setup by the vendor so that it is automatically generated on monthly basis.

Data Protection

- The vendor shall ensure provision of Data Protection as defined in UNICEF's data security guidelines, as well as adherence to Oky's data security and data guidelines for all deliverables (for further information kindly refer to Annex E).
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