

Specification/ ToRs

Title of work:	ASER Pakistan 2023
Location:	Across Pakistan (170 districts with online & offline support)
Duration:	6 months (2023)
Implemented by:	Idara-e-Taleem-o-Aagahi (ITA)

1. BACKGROUND:

The Annual Status of Education Report (ASER) represents a pioneering endeavor, characterized by its grassroots origins and community-driven ethos. It stands as a beacon of educational assessment and reform, particularly targeting the rural educational landscape of Pakistan. ASER's genesis lies in addressing a crucial gap in educational outcomes assessment, focusing keenly on the scholastic progress and educational status of children aged 5-16 residing in Pakistan's rural districts.

This citizen-led initiative embodies innovation through its participatory approach, drawing on the collective efforts of ordinary citizens, parents, students, and local communities. ASER Pakistan's overarching goal extends far beyond mere data collection; it aspires to catalyze a paradigm shift in educational awareness and action. By illuminating the actual levels of children's literacy and numeracy skills, ASER empowers stakeholders at all levels, from policymakers to grassroots activists, to effect tangible and sustainable changes in educational policies and practices nationwide.

Through robust data analytics and insightful reporting, ASER not only sheds light on the current state of education but also serves as a catalyst for practical community engagement and evidence-based policy formulation. Its impact resonates deeply, fostering a culture of accountability, continuous improvement, and inclusivity within Pakistan's educational landscape. ASER's journey is one of advocacy, enlightenment, and transformative action, resonating with stakeholders across sectors and inspiring a nation toward educational equity and excellence.

2. OBJECTIVE:

The central idea is to provide an application which can help assess and measure the Foundational Literacy and Numeracy (FLN) status of (in-school as well as out-of-school) children of ages 5-16 years, so that:

- i. Parents/caregivers of students are able to assess (and validate) their children's FLN skills and take action by demanding better quality of education from private/public school systems and/or alternative education systems (madrassahs, NFBE institutions etc.)
- ii. Teachers are able to track students' FLN skills and tailor their actions and instruction to address gaps highlighted by the assessment results

The assessment app aims to help highlight and address the poor learning levels of in-school, displaced, and/or out-of-school children. Government schools often tend to promote primary school children to the next grade without closing their foundational literacy and numeracy gaps, causing them to persist without learning. Consequently, this leads to children performing significantly below competency standards for their respective grades. Due to an influx of first-generation learners after elimination of fee-barriers to schooling;

there exists a large variation in within-class learning levels, which persists and widens as children transition to higher grades without mastery of basic competencies.

To Interpret Results for Informed Policy Decisions Across Levels:

Beyond data collection and analysis, the survey's ultimate goal is to translate insights into actionable policy recommendations and advocacy initiatives. The interpreted results serve as evidence-based narratives, illuminating successes, gaps, and priorities within the education sector. This information empowers policymakers, education advocates, and community stakeholders to engage in evidence-driven dialogue, prioritize resource allocation, design targeted interventions, and advocate for systemic reforms at local, regional, and national levels. The survey thus becomes a catalyst for informed decision-making, driving substantive changes in educational policies, practices, and investments.

By aligning these objectives with robust data collection methodologies, rigorous analysis frameworks, and strategic dissemination strategies, the ASER survey transcends mere data gathering, evolving into a dynamic engine of educational transformation and equity across Pakistan's diverse educational landscape.

- Work with ITA's IT department to build an application that can be used across Pakistan.
- The primary objective of the assignment is to design and develop the Android, iOS applications for phones and tablets for internal and external/public use. The designed survey tool should work online and offline either, so if the internet is not available the stored data on App can be synced on online server.
- Develop a Business Intelligence dashboard to monitor and track the activities of individuals, apply data validation checks, Assessments and generate reports.
- Follow the basic protocols of the survey as described by the ASER Research Team.
- Pre-testing of the application developed and removing the problems later identified to ensure compliance. We recommend the Agile methodology for achieving the milestones
- Release/Launch the app on cross platform including web, iOS and Android (3).
- The application will be open source while protected through adopting best practices such as environment variables, secure configuration management, and restricted access controls, we can safeguard critical information. Additionally, complication techniques need to be implemented to further protect sensitive URLs
- Post release monitor application performance, assist in analysis, gather feedback, of design, release and manage the life cycle of the mobile applications.
- Frequent Knowledge sharing with the team members and colleagues on the development.
- Produce monthly reports for mobile application performance and recommendations for improvements and updates.

- Streamline the historical ASER data and make it presentable on the Business Intelligence tool. Make historical data synchronous for longitudinal comparison.
- Self-driven application with all the ASER tools.
- Will maintain records of all the students who have been registered and it will encourage the parents and teachers to assess the children's progress.

To Obtain Reliable Estimates of Children's Schooling and Basic Learning:

The primary aim is to gather accurate and reliable data pertaining to the schooling status and fundamental learning competencies, particularly in reading and arithmetic, among children aged 5-16 across various districts. This involves deploying robust assessment methodologies that capture nuanced insights into educational access, attendance, and foundational academic skills. By delving into the grassroots realities of educational attainment, the survey aims to uncover disparities, identify areas of improvement, and lay the groundwork for targeted interventions.

To Monitor Changes in Basic Learning and School Statistics Over Time:

Building on the foundation of past assessments, this objective emphasizes the importance of continuity and progress tracking in educational endeavors. By measuring changes in learning outcomes, school enrollment, and other pertinent metrics from previous survey cycles, the ASER survey facilitates longitudinal analysis and trend identification. This nuanced understanding of evolving educational dynamics enables stakeholders to gauge the efficacy of interventions, identify emerging challenges, and recalibrate strategies for sustained improvement.

3. SCOPE

APPLICATION FUNCTIONALITY

The mobile application will collect FLN assessment data for children assessed by teachers or their parents/caregivers. Furthermore, the app will collect feedback from users i.e., parents/caregivers and teachers for improvement. The data flow for the proposed app is briefly explained as follows:

i. User Registration/Authentication:

The app allows two types of users i.e., teachers and parents/caregivers, via the ‘teacher panel’ and the ‘parent panel’. New users are required to fill out a brief form in order to register. Registered users log into the app using their credentials. The app verified the user’s information against the database.

ii. Home Screen:

Upon successful login, the user is directed to the app’s home screen, where they can access various features of the app.

iii. Child profile/Student profile:

Parents can create individual profiles for each of their children. Whereas, school teachers select their school from the list of schools and then create grade-wise students’ profiles. The app assigns an auto-generated unique-ID to each child against which the assessment data is entered and stored in the database.

iv. Subject Selection:

The user selects one of three subjects for FLN assessment from the available options. The app fetches the relevant assessment data from the database for the selected subject, including questions, answer choices, and correct answers.

v. Assessment Attempt:

The user (parent/caregiver or teacher) then allows the child/student to attempt the assessment within the selected subject, without any time constraints for the attempt.

vi. Assessment Submission:

After completing the assessment, the user (parent/caregiver or teacher) submits the child's/student's responses. The app records the child's/student's responses and determines which level of reading or arithmetic competency child/student is currently at.

vii. Result Display:

The assessment result, including the child's/student's competency level and any feedback, is displayed to the user. Parents are able to view auto-generated student report cards based on assessment results for their children. For assessments conducted by teachers, the parents are automatically shared the login username and password via SMS for viewing their child's results using the app.

viii. Progress Tracking:

The child's/student's assessment results and progress are stored in the database, allowing parents/caregivers or teachers to track their performance over time.

ix. Teacher Dashboard:

The app may have a teacher dashboard that provides real-time insights into progress of individual students within the same classroom, so that teachers can track which students are lagging behind their peers and adjust their teaching methods appropriately.

x. Notification and Reminders:

The app may send notifications or reminders to users for assessments, updates or personalized study recommendations for the child/student.

xi. Settings and Preferences:

Users can customize app settings and preferences, such as the language (Urdu, English, Pashto, Sindhi), notification preferences, and profile details. These settings are stored in a database.

xii. Feedback and Support:

Users may provide feedback or seek support through the app. This feedback can be stored in the database for future reference.

xiii. Analytics and Reporting:

The app may collect analytics data to track user engagement, performance, and app usage patterns. This data can be fed into introducing further improvements in the app as well as decision-making. The "Head Admin" will be ITA and will have complete access to the data. UNICEF, as a "Partner Admin" will be given access to the app's analytics dashboard.

Moreover, if the ASER FLN app is adopted by public school systems; the relevant provincial EMIS will also be given access to school-level data so that at a later stage the assessment app results can be integrated with student's administrative record. Limited access will also be extended to "partners" i.e., the NGOs, INGOs, public schools or low-cost private schools that adopt the FLN assessment app.

Finally, strict data security and privacy measures will be implemented throughout the data flow to ensure the protection of users' as well as children's/student's sensitive information.

ADDITIONAL FEATURES TO INCLUDE:

- *User Engagement Metrics:*
Implement analytics tools to track user engagement, behavior patterns, and app usage metrics for continuous improvement and user satisfaction.
- *Accessibility Features:*
Incorporate accessibility features such as screen readers, voice commands, and text-to-speech options to ensure inclusivity and usability for users with disabilities.
- *Data Privacy and Security Protocols:*
Adhere to strict data privacy and security protocols, including anonymization of user data, secure data storage practices, and regular security audits.
- *Multi-language Support:*
Enable multi-language (Languages used for ASER Tool) support within the app to cater to diverse language preferences and enhance user accessibility. The languages
 - Urdu
 - Sindhi
 - English
 - Pushto
- *Scalable Infrastructure Capabilities:*
Design the backend infrastructure with scalability in mind to accommodate a growing user base and increased data processing demands without compromising performance.

Gamification for Children (Age & Learning level appropriate):

Incorporate gamification elements within the ASER Pakistan 2023 Mobile Application to enhance engagement and motivation among children participating in the educational assessment activities. Gamification strategies can include:

- *Interactive Learning Modules:*
Develop interactive learning modules disguised as games to teach foundational concepts in literacy and numeracy. Use engaging visuals, audio cues, and interactive quizzes to reinforce learning objectives.

- *Progress Tracking and Rewards:*
Implement progress-tracking mechanisms to monitor children's learning milestones and achievements within the app. Reward positive learning behaviors such as completing assessments, improving scores, or mastering educational challenges with virtual badges, points, or certificates.
- *Storytelling and Narrative-based Learning:*
Integrate storytelling elements and narrative-driven gameplay to contextualize educational content within engaging narratives. Encourage children to explore educational concepts through interactive stories, quests, or adventures tailored to their age and learning level.
- *Collaborative Challenges and Leaderboards:*
Foster collaboration and healthy competition among children by introducing collaborative challenges or multiplayer games within the app. Implement leaderboards to showcase achievements and encourage friendly competition while promoting teamwork and peer learning.
- *Incentivized Learning Activities:*
Design learning activities and quizzes that offer incentives such as unlocking new levels, accessing bonus content, or earning virtual rewards upon successful completion. Create a sense of achievement and progression to motivate sustained engagement with educational content.
- *Feedback and Personalized Learning Paths:*
Provide real-time feedback and adaptive learning paths based on children's performance and learning preferences. Use gamified feedback mechanisms such as progress bars, congratulatory messages, or interactive avatars to provide positive reinforcement and encourage continued learning efforts.
- *Parental Engagement and Monitoring Tools:*
Include features that allow parents or guardians to track their child's progress, view learning analytics, and participate in educational activities collaboratively. Provide insights into learning outcomes, areas of improvement, and suggested learning pathways to support parental involvement in their child's education journey.

By incorporating gamification elements, the ASER Pakistan 2023 Mobile Application can transform educational assessments into engaging and immersive experiences, fostering a love for learning, promoting active participation, and enhancing overall educational outcomes for children across Pakistan's diverse communities. These gamified features align with ASER's mission of innovative educational assessment and policy reform, making learning enjoyable and impactful for young learners.

EXCLUSIONS

It won't be a household survey application the scope will remain centered to the learning levels of the children with basic child information.

4. KEY RESOURCES & RESPONSIBILITIES

- a) *Project Manager*: Oversees project execution, schedules, and client communication.
- b) *Team Lead*: Coordinates team efforts, ensures tasks are completed on time, and assists with problem-solving.
- c) *QA Engineer*: Responsible for testing the application to ensure quality and functionality meet requirements.
UI/UX Designer: Designs user interfaces and ensures a positive user experience.
- d) *Developers*: Responsible for coding and implementing the application's features and functionalities.

5. WORKSTREAM ORGANIZATION STRUCTURE

Teams are organization structure and communication flow should be defined as follows:

- **Decision-making**: Specify decision making process and the team involved.
- **Escalation**: Clarify procedures for escalating issues and conflict resolution procedures. Ensure these aspects align with your project goals and foster effective collaboration.

6. APPROACH

The approached need to be well defined in terms of the following:

- **Development Methodology**: Vendor should give clear view about their chosen approach (Agile, Scrum, Waterfall) and its suitability for the project's needs.
- **Requirements Gathering and Analysis**: Need to know the process for gathering, analyzing, and translating requirements into features to ensure alignment with project objectives.
- **Addressing Risks and Assumptions**: Need to discuss any identified risks or assumptions related to the approach, and collaborate on strategies to mitigate them effectively.

Technical Requirements and Performance Expectations:

- Utilize the framework for cross-platform development to ensure consistency and performance across Android and iOS devices.
- Ensure app responsiveness, fast loading times, and minimal data consumption for optimal user experience, especially in low-bandwidth areas.
- Implement secure authentication mechanisms and data encryption standards to protect user data and comply with privacy regulations.

Backend Requirements:

- Develop a scalable and secure backend infrastructure using technologies such as Node.js or Django, integrated with databases like MySQL or MongoDB.
- Enable seamless synchronization between the mobile application and backend servers for real-time data updates and reporting.

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promoting active participation, and enhancing overall educational outcomes for children across Pakistan's diverse communities. These gamified features align with ASER's mission of innovative educational assessment and policy reform, making learning enjoyable and impactful for young learners.

7. MILESTONES & PROJECT TIMELINE

Milestones	Description	Time Required
M1	Planning and Analysis	1 Month
	<i>Research and Idea Validation:</i> An inception report for a mobile application and its workflows is a comprehensive document that outlines the initial phase of the development process. It should delineate a detailed overview of the proposed mobile application, including its objectives, scope, key features, user requirements, design documentation, technical design/specifications, user manual/guides, admin documentation, test plans, bug reports, performance test results, deployment and maintenance guides, legal and licensing documentation etc.	
	<i>Planning and Strategy:</i> The report also describes the various workflows involved in the application, highlighting the sequence of activities and interactions between different components or users	
	<i>Design and Wireframing:</i> the inception report may include a project timeline, resource allocation plan, and an assessment of potential risks and challenges. It will serve as a foundation for the project, providing stakeholders with a clear understanding of the mobile application's concept, functionalities, and implementation strategy	
M2	Design or UI/UX – An Intuitive and consistent design across platforms	1 Month
	<i>Development Approach Selection:</i> Flutter or React Native, planning about developing mobile applications based on the vendor's experience. Web Development: web-based approach, plan based on the proficiency in web development technologies such as HTML, CSS, JavaScript, and relevant frameworks like React.js, Angular, or Vue.js.	
	<i>App Designing and Prototyping:</i> It focuses on designing the layout, visual elements, and interactions within the application to ensure ease of use and engagement for the target audience. The Design document should include User Research, Information Architecture, Wireframing and Prototyping, Visual Design, Responsiveness, Interaction, Design, Usability Testing, Accessibility and other factors.	
	<i>Project Management:</i>	

	<ul style="list-style-type: none"> • Version Control: decide on version control system (e.g., Git, Bitbucket) for code management. • Project Tools: Decide on task tracking and collaboration tools (e.g., Jira, Slack). • Tasks & Responsibilities: Clarify team roles, task prioritization, and requirements handling. • Agile Methods: Discuss decision on Agile methodologies and iterative development. • Documentation: Discuss about their documentation practices for code, APIs, and reporting. 	
M3	App development (actual)/ Implementations	2-Months
	The Developer should give a walkthrough of end-to-end workflows, front-end and back-end components of the developed application, webpage, business intelligence reports	
M4	Pre-pilot test of the application or Testing and Integration	1.5-Month
	<i>Quality Assurance:</i> In this process, we will be verifying and validating whether an application is bug-free meets the technical requirements as guided by its design and development, and meets the ITA requirements effectively and efficiently by handling all the exceptional and boundary cases.	
	<i>User Testing and Feedback:</i> The application is will be tested on 20 children in each province including AJK & Gilgit Baltistan	
	<p>Security Checks and Compliance:</p> <ul style="list-style-type: none"> • Data Security Measures: Discuss about the vendor's data encryption standards for sensitive information (such as user credentials, payment details, and personal data). • Compliance Requirements: Identify specific regulatory requirements or industry standards relevant to your project (e.g., GDPR, HIPAA, PCI-DSS) and ask how the vendor ensures compliance. • Code Security and Vulnerability Management: Discuss secure coding practices followed by their development team (avoiding common vulnerabilities such as SQL injection, XSS attacks, insecure deserialization). 	
M5	Final launch & Maintenance	6-Month
	<i>Deployment and Launch:</i> Will have 6 provincial launches & will partner with 12 partner organizations for the deployment	
	<i>Post-Launch Activities:</i> Will have a bi-monthly meeting to make	

	sure the project is on track	
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8. BUDGET

The budget for the project development cost, licensing fees, storage fees and any other expense need to be stated in detail.

9. OTHER NOTES

a) Changes in App

Minor Changes: The Development Company will be flexible to do minor changes which might ITA team will think of them in future, All kinds of bugs and errors will be fixed, DML Operations (Addition, Updation, Deletion, Data Reflection), incorrect text on button, Wrong colors, adding/editing specific fields, GUI inconsistencies. (A minor change is usually one that does not require a significant amount of preparation and planning, they are usually low-risk and won't have a large impact on how the business operates)

Major Changes: All major changes post-delivery will be done but with economical cost. (The major changes involve a significant amount of preparation and work with complex situations or major expenses. They include a significant alteration of APPs's infrastructure that will require a period of enough time, or migrating from a legacy application to a newer one. These will be complex, many-stepped processes and therefore must undergo detailed preparation work before the implementation phase.)

The development company shall remain flexible to any change(s) - major or minor-suggested by the client side.

On completion of Application the development team will provide source code of the application.

b) Delivery

The Software Applications shall function in accordance with the Specifications on or before the Delivery Date.

- If the Software as delivered does not conform with the Specifications, the Client shall within 30 working days of the Delivery Date notify the Development Company in writing of the ways on which it does not conform with the Specifications. The Development Company agrees that upon receiving such notice, it shall make reasonable efforts to correct any non-conformity.
- The Client shall provide to the Development Company written notice of its finding that the Software conforms to the Specifications within 30 working days of the Delivery unless it finds that the Software does not conform to the Specifications as described in Section 3 herein.

c) Legal considerations, data privacy requirements:

The Development Company shall not (i) disclose to any third party the business of the Client, details regarding the Software/ Apps, including any information regarding the Software’s code, the Specifications, or the Client’s business (the “Confidential Information”), (ii) make copies of any Confidential Information or any content based on the concepts contained within the Confidential Information for personal use or for distribution unless requested to do so by the Client, or (iii) use Confidential Information other than solely for the benefit of the Client.

d) Intellectual property

The Parties acknowledge and agree that the Client will hold all intellectual property rights to the Software including, but not limited to, copyright and trademark rights.

The Development Company agrees not to claim any such ownership in the Software’s intellectual property at any time prior to or after the completion and delivery of the Software to the Client.

e) The Development Company will provide the script (Code) of All Apps.

Third party services or materials will bear the cost of all given services and materials

- a. Website domain and hosting for deployment
- b. Payment Method/ Gateway
- c. SMS services
- d. Google Play Store Account
- e. Google APIs where and when the applications are needed
- f. Or any paid services which necessary to complete project scope

f) Dispute resolution

All disputes should be sorted by both companies internally first but if deadlock arises any legal procedure should be notified first in written form.

10. VENDOR SELECTION CRITERIA - QUALIFICATIONS & EXPERIENCE REQUIRED

• *Experience in Mobile App Development: (Weightage 20%)*

Look for companies with a proven track record in developing mobile applications, especially in the education sector—prior experience creating cross-platform apps using frameworks like Flutter.

• *Technical Expertise: (Weightage 15%)*

Evaluate the company’s technical skills in mobile app development, backend infrastructure development, API integration, database management, and security protocols. Ensure they have experience with technologies such as Dart, Node.js, Django, MySQL, MongoDB, and encryption standards.

• *Data Security and Privacy: (Weightage 5%)*

Stress the importance of data protection, especially when dealing with educational content and user data.

- **Web Development: (Weightage 5%)**

For a web-based application, highlight expertise in front-end (HTML, CSS, JavaScript) and back-end (server-side languages, databases) development.

- **Qualifications and Skills: (Weightage 10%)**

- **Education:** Specify that the firm's team members should have relevant degrees (e.g., in Computer Science, Software Engineering, or related fields).
- **Experience:** Request details about the firm's previous projects in educational technology or similar domains. Highlight the need for proven success in delivering quality applications.
- **Programming Languages:** Mention proficiency in languages like Dart, Java, Swift, Kotlin or others relevant to the project.
- **Agile Methodology:** Specify familiarity with Agile/Scrum practices for efficient development.
- **Version Control:** Emphasize using tools like Git for collaborative development.
- **Database Management:** Highlight experience with SQL or other database systems.
- **Quality Assurance (QA):** Request details about their QA processes to ensure a bug-free application.

- **Agile Development Practices: (Weightage 10%)**

Assess the company's project management methodologies, communication channels, and ability to work in an agile environment. Look for transparency, frequent progress updates, and responsiveness to change requests.

- **Scalability, Performance and Design: (Weightage 15%)**

Ensure that the company has experience in designing scalable backend infrastructure to handle a large user base and data processing demands. Evaluate their approach to optimizing app performance, reducing loading times, and minimizing data consumption.

Emphasize the importance of user experience (UX) and user interface (UI) design. Look for companies that prioritize usability, accessibility features, intuitive navigation, and engaging interfaces, especially considering the target audience of children.

- **Innovative Solutions: (Weightage 10%)**

Seek a company that can propose innovative solutions, such as gamification elements, to enhance user engagement and motivation within the educational app.

- **Communication and Collaboration: (Weightage 10%)**

Evaluate the company's communication channels, language proficiency, and collaboration tools to ensure smooth coordination, feedback incorporation, and knowledge sharing throughout the project lifecycle.