Action Against Hunger
Canada

Toronto, Ontario, Canada
May 02, 2025

Our reference: CA-TOR-00004

SUBJECT: INVITATION TO TENDER FOR SOFTWARE DEVELOPMENT SERVICES – DEVELOPMENT AND MAINTENANCE OF SMART+

Dear Applicant,

Following your interest in the above-mentioned invitation to tender, please find enclosed the following documents, which constitute the tender dossier.

Any request for clarification must be received by Action Against Hunger in writing at least 3 days before the deadline for submission of tenders. Action Against Hunger will reply to bidders' questions before the deadline for submission of tenders.

Costs incurred by the bidder in preparing and submitting the tender proposals will not be reimbursed.

We look forward to receiving your tender at the address specified in the Instructions to Bidders before **17:00 EST (Toronto) on May 21, 2025,** as stated in the procurement notice.

If you decide not to submit a tender, we would be grateful if you could inform us in writing, stating the reasons for your decision.

Yours sincerely,

SMART+ Development Team
SMART Initiative
Action Against Hunger Canada

Call for Tender
for
Software Development Services – Development and Maintenance of SMART+

Publication reference:
CA-TOR-00004

May 02, 2025

TABLE OF CONTENTS

A - INSTRUCTIONS TO BIDDERS

In submitting a tender, the bidder accepts in full and without restriction the special and general conditions governing this tender as the sole basis of this tendering procedure.
The bidder accepts Action Against Hunger General Terms and Conditions of Purchase by default, or will include its own Sales conditions in its offer.
If the bidder wishes to point out restrictions to Action Against Hunger Purchase Terms and Conditions, such reservations should be clearly explained in a letter included in the offer.

Failure to submit a tender containing all the required information and documentation (including all Appendices and supporting documentations as part of this RFP) within the deadline specified may lead to the rejection of the tender.

1. Preamble

Action Against Hunger tackles the causes and effects of hunger and diseases that threaten the lives of vulnerable children, women and men. Established in France in 1979, Action Against Hunger are a nongovernmental, non-political, non-religious, non-profit organisation.

Action Against Hunger opened a headquarters in Canada in 2006. This office fosters better understanding of hunger in malnourished communities and the best ways to support them, recruits committed Canadian experts who work alongside communities to save lives and develop sustainable solutions, and supports the 'big picture' - global collaboration of governments, agencies and citizens working on solving hunger.

Since 2007, Action Against Hunger Canada has led on the development and implementation of one of the world's leading nutrition and mortality survey methodologies: SMART (Standardized Monitoring Assessment in Relief and Transition). SMART standardizes the way data collection is done at the household level in the field by systematically asking the same questions. SMART also provides a free software tool to automate data quality assessment and analysis. The global project has trained thousands of health workers around the world to date.

Action Against Hunger is the official SMART project convener for the Global Nutrition Cluster and works closely with its members to ensure that member agencies and their partners can access tools and learning on the methodology. All SMART activities are targeted towards humanitarian and development stakeholders, including government bodies conducting surveys and using the methodology. Strategically the global project aims to:

- Contribute to innovative research and development for the advancement of new contexts, target populations and technology for nutritional assessments
- Provide high quality learning activities on nutrition assessments
- Increase the global awareness of the methodology and advocate for the usage of it as the predominant nutrition survey methodology

- Leverage new partnerships within the humanitarian, development and private sector to support the broader goals of the project

Data from SMART is used by many different actors and sectors, including, but not limited to: the Integrated Food Security Phase Classification (IPC), United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA) for humanitarian needs overviews and humanitarian response planning (HNO/HRP), academia, UN agencies, governments, and civil society organizations for program design, fundraising, research, and advocacy at country, regional, and global levels. Despite this, there remain challenges in attaining timely, good quality, reliable data on not only malnutrition and mortality but also on household food security, hygiene, and child morbidity. Current methods of assessment consist of time-consuming, manual approaches and fragmented data collection across sectors. These methods are subject to significant inefficiencies and opportunities for human error. Furthermore, the use of the collected data is not optimized due to the lack of a centralized, real-time, automated, global repository and dashboard for malnutrition.

In response to these gaps, the SMART Initiative has developed SMART+, a complete end-to-end digital infrastructure that covers the entire data collection and reporting chain. It consists of a mobile application, centralized survey management platform, data aggregator, and visualization dashboard.

2. Purpose of the Call for Tenders

The purpose of this Call for Tenders is to solicit competitive offers for the supply of Software Development Services for the 1) development *or* 2) maintenance of SMART+ within Action Against Hunger Canada.

The Purpose of this Call for Tender is to sign a contract for the supply of software development *or* maintenance services. The Call for tenders aims at selecting reliable equipment and supplier(s).

Total quantities and services mentioned in this Call for Tenders are estimates of Action Against Hunger's immediate needs and may vary by more or less ten percent (10%): this estimation can in no case be considered as a firm order from Action Against Hunger.

A detailed description of the services required by Action Against Hunger Canada in each stage is contained in the technical specifications (see APPENDIX A – Technical specifications).

3. Call for Tenders Schedule:

	DATE	TIME*
Deadline for request for any clarifications from Action Against Hunger	May 18, 2025	5:00 PM

Deadline for submission of tenders (receiving date, not sending date)	May 21, 2025	5:00 PM
Tender opening session by Action Against Hunger	May 22, 2025	9:00 AM
Notification of award to the successful tenderer	TBC	
Signature of the contract	TBC	

* All times are in the local time of Toronto, Canada.

Please note all dates are provisional dates and Action Against Hunger reserves the right to modify this schedule.

Please note Action Against Hunger reserves the right to pre-select some of the received offers, based upon the criteria listed in article 14 of the present document, to enter into a competitive dialogue with the shortlisted companies.

4. Questions and Clarifications

If Action Against Hunger, either on its own initiative or in response to a request from a prospective bidder, provides additional information on the tender dossier, such information will be communicated simultaneously in writing to all the bidders.
Bidders may submit questions in writing to the following by email up to five (5) calendar days before the deadline for submission of tenders, specifying the publication reference and the Tender title:

Contact name: SMART+ Development Team
E-mail: procurement@actionagainsthunger.ca

Any prospective tenderer seeking to arrange individual meetings with Action Against Hunger during the tender period may be excluded from the tender procedure.

5. Clarification meeting / site visit

No clarification meeting planned.

6. Eligibility

Participation in tendering is open on equal terms to any natural and legal persons or company.

However, to comply with some of Action Against Hunger's donors' rules, participants must clearly indicate their company's nationality and origin of the proposed goods/services.

7. Instructions to submit an Offer

7.1 – Response Format

The tender shall consist of one (1) email.

Offers should be sent to procurement@actionagainsthunger.ca with the subject line:

Development and Maintenance of SMART+ -- CA-TOR-00004

Offers must be received by Action Against Hunger no later than the 17:00 EST (Toronto) on May 21, 2025

NB: **Late proposals will not be accepted and will be returned to the Proponent or discarded.** Also, all proposals will be irrevocable after the Call for Tenders closing date.

7.2 – Content of Tenders

The Tenderer must provide sufficient information in the proposal to demonstrate compliance with the requirements set out in each section of this request for proposal. The proposal shall include, as a minimum:

1) An itemized list of all documents in the proposal.

2) "Supplier Questionnaire" duly completed (see Appendix B). This questionnaire should be completed with all required information such as:

    a) Proof of Company Registration.

    b) A copy of audited financial statements for last three (3) years (balance sheet and income statement).

    c) The details of the names, address and contact information of three (3) clients for whom the same type of services were provided. Action Against Hunger reserves the right to contact these references, without notifying the Tenderer.

    d) An organisational (human resources) chart for the company in general.

    e) An organisational (human resources) chart, including CVs, for the proposed SMART+ development team, clearly indicating reporting lines and client contact points.

3) A detailed activity schedule (timeline) for the proposed works.

4) A detailed Technical Offer addressing each component of SMART+ and responding to all technical specifications in Appendix A. Offer formats are flexible but must address all stages of development and clearly demonstrate how the company and/or project team meet the desired qualifications outlined in this document. Action Against Hunger Canada is open to creative or unconventional solutions for SMART+ so long as the technical requirements and the needs of users can be met. Technical Offers should include at a minimum:

    a) Profile of Team Assigned to the SMART+ project which clearly outlines:
        i) The structure of the team and reporting/client communication workflows.
        ii) Why the team has the required skills and experience to perform the work to a high technical standard.

iii) Links to online portfolios (e.g., GitHub), publications, or equivalent should be included in the profile.
iv) Each team member's amount and type of experience on similar projects
v) Approximately how much time each individual will spend on the project per week, and for how many weeks out of the total timeline.

b) Company Profile outlining history and profile of organization, including focus areas and an overview of the organization's structure and governance.

c) Portfolio of previous work, including examples of the organization's previous or ongoing projects relevant to the goals of SMART+. Action Against Hunger is particularly interested in any recent mission-critical software development projects. Examples of code/software, if available, are encouraged.

5) "Pricing Matrix" or detailed Price offer, organized by stage of development, with explanatory notes if necessary (see Appendix C). The preferred currency for this tender is Canadian Dollars (CAD).

6) Details of proposed maintenance retainer, including definition of work which falls within the scope of the retainer, definition of work which falls outside the scope of the retainer and any conditions or otherwise relevant information related to maintenance.

7) "The Declaration of compliance and commitment to respect Action Against Hunger Good Business Regulations" filled and signed by the duly authorised person (see Appendix E).

8) Action Against Hunger Terms and Conditions of Purchase signed and approved by supplier (see Appendix F).

9) If applicable, a letter specifying differences between the Supplier Sales conditions and Action Against Hunger General Purchase Conditions.

10) A letter of the bidder's bank to guarantee the bidder's solvency (see Appendix D).

11) Certificate of origin of the products/services.

Failure to provide all of the above and in the formats stipulated may result in disqualification of the Tenderer's proposal.

8. Call for Tender Process

Action Against Hunger reserves the right to negotiate, accept or reject any or all proposals and quotations at its sole discretion and to pursue or act further on any responses it considers advantageous. Action Against Hunger does not bind itself to accept the lowest prices or any proposal. All proposals will be irrevocable after the Call for Tenders closing date.

Action Against Hunger reserves the right to select a shortlist of pre-selected suppliers, based on the criteria announced in paragraph 14 of the present document. Further discussions and competitive dialogue may then be conducted with the pre-selected suppliers.

9. Period of validity

Suppliers shall be bound by their tenders for a period of one hundred and eighty (180) days minimum from the deadline for submission of tenders.
However, the Prices and conditions defined in the contract signed with the selected supplier will be valid for three (3) years after contract signature.

10. Currency of tenders

Preferably, tenders should be presented in Canadian Dollars (CAD). Any applicable taxes should be included in the quote and presented separately.

11. Language of offers and procedure

The offers, all correspondence and documents related to the tender exchanged by the bidder and Action Against Hunger must be written in English.

Supporting documents and printed literature that the bidder provides may be in another language, provided they are accompanied by an accurate translation into English.

For the purposes of interpretation of the tender, the English version will prevail.

12. Alteration or withdrawal of tenders

Bidders may alter or withdraw their tenders by written notification prior to the deadline for submission of tenders referred to in Article 3. No tender may be altered after this deadline. Withdrawals must be unconditional and will end all participation in the tender procedure.

13. Costs of preparing tenders

All costs incurred by the bidder in preparing and submitting the tender are not reimbursable. All such costs will be borne by the bidder.

14. Opening, evaluation of tenders and selection criteria

The opening and examination of tenders is for the purpose of checking whether the tenders are complete and whether the tenders are generally in order. The contract will be awarded to the technically and administratively compliant tender that is the most economically advantageous, taking into account the quality of the services offered and the price of the tender.

Tenders will be evaluated on the following criteria:

1) **Technical (75%)**
    - Appropriateness of the organization's profile, experience, and capacity to implement the required work to a high technical standard and within appropriate timelines (10%).

- Breadth and depth of previous projects and their outcomes for clients (10%).
- Quality and relevance of the proposed product, specifically its ability to respond to technical specifications (30%).
- Qualifications, experience, and structure of the proposed development team (25%).

2) **Financial (25%)**
   - Competitiveness of price relative to other proposals (10%).
   - Attractiveness of proposed pricing and fee structure based on its potential to offer value for money (15%).

While care has been taken to specify the selection criteria, Action Against Hunger reserves the right to change the weighting during the evaluation. Beyond these requirements, service providers are encouraged to elaborate on how they can add special value through their specific approach or expertise. Action Against Hunger Canada is particularly interested in issues of privacy, confidentiality, user experience, inclusion, reliability, and the ability to operate in challenging environments around the world.

In the interests of transparency and equal treatment and without being able to modify their tenders, bidders may be required, at the sole written request of the evaluation committee, to provide clarifications within 48 hours. Any such request for clarification must not seek the correction of formal errors or of major restrictions affecting performance of the contract or distorting competition.

Any attempt by a bidder to influence the evaluation committee in the process of examination, clarification, evaluation and comparison of tenders, to obtain information on how the procedure is progressing or to influence Action Against Hunger in its decision concerning the award of the contract will result in the immediate rejection of his tender. No liability can be accepted for late delivery of tenders. Late tenders will be rejected and will not be evaluated.

15. Notification award and contract signature

The successful bidder will be informed in writing that its tender has been accepted (notification of award). Action Against Hunger will send the signed purchase of services documents in two original copies to the successful bidder.

Within five (5) working days following the reception, the successful tenderer will sign, date and send back the contract. The successful tenderer will have to communicate the number and exact references of the bank account where the payments will be executed.

If the successful tenderer fails to sign and send back the contract within five (5) working days, Action Against Hunger can consider after notification the award as null and void.

After selection, and before signature of the contract, Action Against Hunger reserves the right to interview the team of the selected tenderer that will be allocated for the works. Action Against Hunger reserves the right to de-select the tenderer if the capacity is deemed not to be adequate or compatible with that stated in the tender dossier.

The unsuccessful tenderer will be informed by email shortly after the award.

16. Ownership of tenders

Action Against Hunger retains ownership of all tenders received under this tender procedure. Consequently, bidders have no right to have their tenders returned to them.

17. Contract

The contract that will be concluded between the successful tenderer and Action Against Hunger is done according to Action Against Hunger standard contract.

The contract will be based by order of preference on the following elements:

- Terms and requirements as defined in the present Tender dossier
- Action Against Hunger Terms and Conditions attached in Appendix F for additional elements not covered in the Tender Dossier
- The selected supplier's offer
- Specific conditions that differ from the above, offered by the supplier and explicitly accepted by Action Against Hunger

18. Cancellation of the tender procedure

In the event of a tender procedure's cancellation, bidders will be notified by Action Against Hunger.

Cancellation may occur where:

1. The tender procedure has been unsuccessful, namely where no qualitatively or financially worthwhile tender has been received or there has been no response at all;
2. The economic or technical parameters of the project have been fundamentally altered;
3. Exceptional circumstances or *force majeure* render normal performance of the project impossible;
4. All technically compliant tenders exceed the financial resources available;
5. There have been irregularities in the procedure, in particular where these have prevented fair competition.

Under no circumstances will Action Against Hunger be liable for damages, whatever their nature (in particular damages for loss of profits) or relation with the cancellation of a tender, even if Action Against Hunger has been warned of the possibility of damages.

The publication of a procurement notice does not commit Action Against Hunger to implement the announced programme or project.

19. Ethics

Action Against Hunger pays very careful attention to working with companies that commit to respect basic Ethics Rules. The tenderers have to read and understand the Good Business

Regulations as defined by Action Against Hunger and introduced in the Appendix E of this tender dossier. The tenderers will have to fill and sign the Appendix E *Declaration of compliance & commitment to respect Action Against Hunger Good Business Regulations.*

B – TECHNICAL and COMMERCIAL SPECIFICATIONS

20. Technical description of the Goods / Services

20.1 Detailed Responsibilities

20.1.1 High-level Description of Work to be Performed

The subject of the call for tender is the supply, delivery and maintenance by the supplier of the following services to Action Against Hunger for either a) Development *or* b) Maintenance:

A) Development

- **Develop additional features as based on the specifications in Appendix A:** the SMART Initiative aims to expand the analytical capabilities of the SMART+ Platform and updating existing graphics, functionalities, and report templates/outputs based on feedback from existing users.

- **Test the system:** In addition to extensive unit testing by the tenderer, each of the system components should be tested separately by Action Against Hunger Canada and users, and a broader User Acceptance Testing phase should be planned for at the end of the software development. Given the high number of stakeholders and users across many countries, a longer testing phase than would be usual is anticipated relative to the technical complexity of SMART+. Moreover, service providers will need to account for the unique security, operational (e.g., connectivity), multi-lingual and multi-cultural context in which SMART is used to effectively test the product.

- **Document the work:** All software development work should be documented in a transparent and understandable way, to enable other software developers in the future to understand, modify, and extend the software design where appropriate.

- **Provide continuing assistance in maintaining SMART+:** A portion of the contract will be reserved for any assistance in maintaining the system throughout the 2 years and beyond. The service provider is asked to provide in the proposal an overview of the type of maintenance they will be able to provide with this retainer (e.g. how many days of maintenance, until when in the future) and identify the types of work which fall under this retainer.

B) Maintenance

- **Ensure proper upkeep of the SMART+ infrastructure** (SMART collect, platform, aggregator, and dashboard) with a special focus on the following tasks: resolving data entry tech debt tickets and bug fixes; implementing missing backend API integration tests; implementing missing snapshot tests on the platform frontend; implementing missing unit tests on the platform frontend; optimizing database queries; refactoring the

survey update endpoint; and implementing functionality to calculate, store, and update anthropometric indicators.

All supplied items will have to be compliant with international and national standards and norms, and to be adapted to the extreme conditions they will be used in poor, non-existent, and intermittent internet connectivity, low-specification devices and older operating systems, and stringent security/confidentiality policies.

20.1.2 Desired Qualifications of the Development Team and/or Company

Generally, to complete these works to the quality required for SMART+, the company is expected to propose a team with the following qualifications

Experience in **managing significant application development projects with multiple stakeholders**, with a focus on:

- Productively managing experts from diverse technical and non-technical backgrounds.
- Managing projects within budget, overcoming financial challenges and clearly communicating budget constraints, using Agile, traditional, or hybrid approaches where applicable.
- Dedicating staff that can focus on the project to deliver target outcomes.
- Planning projects, both upfront and throughout the project, clearly communicating timelines and mitigating risks effectively.
- Conducting user experience research in diverse cultural contexts (including through interviews) and integrating findings into the product design and project plan.
- Advocating for user and client interests, including incorporating user feedback.
- Navigating large organizational structures with complex processes across different countries and cultures.
- Keeping on top of processes, clearly communicating and managing internal (developers) and external (clients) stakeholders.

Experience in **designing multi-tier applications with complex architectures**, with a focus on:

- Integrating numerous applications through secure web and/or hardware application programming interface connections.
- Designing end-user apps for mobile/desktop/web and different operating systems built on top of ODK (Open Data Kit) using language such as Javascript, Java and Ruby.
- Ensuring applications adhere to the highest standards of security and privacy and conform to all relevant laws and regulations, as well as humanitarian community ethical norms.
- Complying with relevant web accessibility standards.
- Running extended user acceptance testing and adapting products as necessary to promote user acceptance.
- High standards of quality assurance and documentation.

- Implementing mission-critical software projects in high-stakes environments (e.g., aerospace, healthcare).
- Striving for an absolute minimum of bugs in production code.

Expertise in statistics and data analytics, with a focus on:

- Expertise in statistics or a quantitatively oriented discipline, including ability to translate statistical functions into code and thoroughly test edge cases and assumptions.
- Experience with data analytics (data science, machine learning and artificial intelligence a plus) or a related field.
- The ability to summarize and visualize data in understandable formats for different audiences.
- Demonstrated ability to work with cloud or high-performance computing infrastructure (e.g., Microsoft Azure, AWS, Google Cloud) or resource-constrained computing (e.g., embedded systems, robotics, edge computing).

Experience in **designing applications with user-centric across web, mobile and desktop**, with a focus on:

- Designing compelling and appealing end-to-end user experiences.
- Customer-centric design of applications, for users with different degrees of technical competence.
- Building interfaces with appealing and intuitive design.
- Building applications for multiple platforms and operating systems.
- Developing internationalized applications for global audiences.

The following features, while not necessary, are preferred:

- Experience in the social sector (ideally humanitarian) and understanding of the unique logistical (e.g., low-bandwidth, intermittent connectivity) and ethical (e.g., confidentiality, privacy, do no harm) challenges facing humanitarian actors.
- Location in Canada or proximity to Eastern Time.

This tender procedure is not divided into lots; tenders must be for the entirety of the works and services indicated.

20.2 Variation in quantity

Action Against Hunger reserves the right to vary the services stipulated at the time of ordering within a range of ten percent (10%) of the contract price. Under this variation, the unit prices used in the tender shall be applicable to the services procured.

Suppliers should clearly outline their proposed pricing structure in their proposal, including how they plan to account for changes to the design of SMART+ arising from stakeholder feedback.

20.3 Special Provisions

More specifically for this call for tender, the supplier will:

- Provide complete source code, bundled so no external dependencies must be installed or downloaded, in a single, well-organized and thoroughly documented repository. This repository should be accessible through software such as Git or equivalent and be protected by a password.
- Provide a complete set of all databases, media, and data files through secure file transfer where feasible. Otherwise, two (2) copies should be mailed on a password-protected USB storage device sent by registered mail to an address specified by Action Against Hunger Canada.
- Provide user-ready, compiled (executable, binary, or equivalent - depending on the operating system), and self-installing versions of the software for all agreed operating systems and platforms.
- Submit final versions of applications to all relevant application purchase platforms (e.g., Google Play, Apple Store), based on the agreed operating systems and platforms.
- Provide Action Against Hunger with all passwords, codes, authentication credentials, or otherwise necessary information to continue to develop and manage the works produced by the supplier.
- Deploy a fully functioning web application for public access as per the requirements of the technical specifications.

20.4 Marking

All software interfaces should follow SMART graphic guidelines. These consist of a specific six (6) colour palette and a set of icons. Action Against Hunger will provide access to these guidelines and images. The main landing page of all software will incorporate donor and affiliate logos, as instructed by Action Against Hunger.

21. Delivery conditions

21.1 Costs and Risks

This section is provided in lieu of an Incoterms 2010 specification.

The supplier is responsible for the cost and risks of:

- Providing the services and all related paperwork in conformity with the contract, at the date and place agreed upon.
- Handling all maintenance, upkeep, and repairs (e.g., “bug-fixes”) eligible under the terms of the maintenance retainer.

Action Against Hunger is responsible of the costs and risks for:

- Logistics and funding for administrative arrangements to the testing location of the User Acceptance Testing phase.

21.2 Expected Delivery Plan

The services are divided in three (3) stages. A detailed description of the services required by Action Against Hunger Canada in each stage is contained in the technical specifications (see APPENDIX A – Technical specifications).

The interested suppliers are required to bid by stages as contracts will be awarded per stage (see table below: Expected Delivery Plan). Tenderers MUST submit an offer for all stages. Offers must clearly show what stages are included. Offers must be submitted for the total quantity of each stage: offers submitted for a partial quantity of one stage will not be taken into consideration by Action Against Hunger.

	Deliverable	Comment
Stage 1	Creation of an option for secondary data analysis	- Inclusion of a selection option for secondary data analysis on the survey manager landing page of the SMART+ Platform. - Option to bypass the survey planning process and use the tool to complete the automatic analysis of core indicators. - Safeguards to ensure that analyses from secondary data are not synced to the SMART+ Aggregator and Dashboard.
Stage 2	Inclusion of automatic analyses and visualizations for two additional anthropometric indicators.	- Generation of results from input data and the reference WHO growth charts as already completed for other core indicators. - Generation of plausibility and quality checks for these indicators, as already completed for the other core indicators. - Inclusion of these data in the report outputs, summary exports, and visualizations on the Aggregator.
Stage 3	Addition of new food security indicators to the SMART+ Platform	- Addition of new food security indicators to the SMART+ Platform questionnaire builder. - Generation of automated, standardized analyses for these additional indicators based upon available guidelines. - Export of results from new food security indicators to summary forms and reports. -
Stage 4	Adjusting existing code based on report template updates.	- Minor graphics and functionality updates, as needed, based on feedback from users in the field.

Action Against Hunger shall bear no responsibility over losses or damages of the procured products/services incurred during the performance period and before acceptance of said products. It is therefore up to the supplier to insure the products if necessary.

21.3 Documentation

Before each delivery, the supplier has to submit a copy of the delivery note and all the documents detailed below BEFORE requesting a preliminary inspection in order to get formal agreement from Action Against Hunger to deliver the product.

For every component of the product/service, the supplier shall always send a delivery note. Delivery slips shall necessarily bear the Contract Reference and / or Purchase order number, batch numbers, serial numbers if any, the full designation and quantities of the delivery.

Added to the delivery note, the selected supplier will also have to provide Action Against Hunger with:

- a Commercial invoice
- a Certificate of Origin (if applicable)
- a Certificate of conformity or Certificates of Analysis (if applicable)

The Supplier commits to inform Action Against Hunger of any constraint or specific regulation linked to the goods or service supply

22. Quality of the product

22.1 Quality Guarantee

The supplier bears the responsibility to verify and certify that the goods and services they supply are in keeping with the conditions applicable to them.

The supplier commits to provide Action Against Hunger with goods and services that will not be subject to manufacturing defect, software bugs or to anything causing premature errors. Products supplied by the Supplier are covered by a three (3) year warranty.

The supplier shall put in place, and communicate to Action Against Hunger, their internal quality control system, if Action Against Hunger deems it necessary for the guarantee of the supplier's products.

The Supplier will inform Action Against Hunger about all quality certifications, including Health Insurance Portability and Accountability Act (USA, 1996) and General Data Protection Regulation (EU, 2016/679), labels (NF, ISO, CE…) and internal quality process that may apply to its goods or services and will supply all official documents upon Action Against Hunger request.

Action Against Hunger reserves the right to verify or use the services of a third party of its choice to verify the implementation by the supplier of the quality control procedures laid down in the supplier's quality control system.

22.2 Preliminary inspection

Once a product or element of a product is ready for a preliminary inspection, the selected supplier will inform Action Against Hunger.

A team comprised of Action Against Hunger staff and, at the discretion of Action Against Hunger, external advisors, will review the product at preliminary inspection. They will examine compliance with the technical and organizational needs of SMART+, SMART users, and Action Against Hunger.

The supplier will adjust and revise products as necessary based on this feedback.

This preliminary inspection procedure should be considered a baseline – Action Against Hunger encourages suppliers to consider more frequent feedback practices.

22.3 Suspension

Action Against Hunger will endeavour to provide written feedback as soon as possible. Until the team assessing the product(s) for the preliminary inspection issues written feedback, delivery of the product will be suspended. If the duration of this suspension exceeds eight (8) calendar days, the delivery date or delivery plan will be postponed by the number of days exceeding.

22.4 Results of the preliminary inspection

Tolerance for the composition or quality of the product(s) is the sole responsibility of Action Against Hunger.

- If the results of the preliminary inspection comply with the requirements defined in the contract Action Against Hunger will inform the supplier they may proceed to subsequent stages.

- A first unacceptable non-compliance will result in requests to modify the product.

- A second unacceptable non-compliance will result in refusal of the product. Refer to the conditions of replacement for non-conforming products for details. Action Against Hunger reserves the right to make additional requests to modify the product before refusal.

22.5 Delivery inspection and acceptance of the delivery

Action Against Hunger representative or an independent or reliable inspection company will carry out the delivery inspection of the product.

The delivery inspection will follow the same format as preliminary inspections. A team comprised of Action Against Hunger staff and, at the discretion of Action Against Hunger, external advisors, will review the product at delivery inspection. They will examine compliance with the technical and organizational needs of SMART+, SMART users, and Action Against Hunger.

The objective of the delivery inspection will be to assess the compliance with the terms of contract of:

- The documentation provided by the supplier.
- The products delivered.
- The quality of the product delivered.

Action Against Hunger representative will indicate any remarks or non-conformity of the products on the delivery note provided by the supplier. These remarks will be the ground for possible payment deductions. If the delivery inspection concludes that the delivery complies with the requirements of the contract, Action Against Hunger will accept the products.

23. Non-conformity of delivery

23.1 Quality and condition

Should the quality or the condition of the products not satisfy Action Against Hunger requirements at the moment of the preliminary inspection or delivery inspection, Action Against Hunger reserves the right to demand:

- The delivery of products which conforms to the order. They will need to be replaced by the supplier at his/her own expenses. The replacement will be executed as soon as possible, at latest within thirty (30) calendar days from the discovery of the non-compliance. The replaced products will again be subject to the rules laid down in this contract;
- or the immediate reimbursement of the payment;
- or the cancellation of the order and of the corresponding price.

If the supplier is not able to replace the defective product(s) within the agreed timeframe, Action Against Hunger reserves the right to ask for the immediate reimbursement of the payment or down payments if any, and to simply cancel the order, totally or partially if the defective product(s) were a partial delivery agreed upon by the parties.

The supplier will have to remove specific markings of the non-accepted products when mentioning Action Against Hunger or institutional donors.

23.2 Quantity

Action Against Hunger reserves the right to refuse any software feature not agreed upon or provided for in the technical specifications and may require its removal or deactivation at the supplier's expense. In case Action Against Hunger decides to accept an additional feature not agreed-upon, an acceptance comment will be clearly added on the delivery note, at the time of delivery.

On the other hand, should software features be missing at delivery, the missing features will be delivered as soon as possible, at latest thirty (30) days after its discovery, at the expenses of the supplier. The then delivered features will be subject to the rules laid down in this contract.

23.3 Late Delivery

Due to the urgency and restrictions arising from Action Against Hunger's humanitarian focus, the disposal or delivery dates define in article 21.2 are fixed and mandatory. The supplier must notify Action Against Hunger about any potential delay, as soon as they are aware of it, in order to anticipate and minimise the consequences. If no agreement can be found, and even if the supplier has informed Action Against Hunger upfront, if the delay is solely the supplier's responsibility, penalties below will apply.

In the event of the Supplier being late for putting goods/services at Action Against Hunger's disposal, a penalty of ten per cent (10%) of the total order amount (before tax), shall apply per week of delay. Any fractional part of a week is to be considered a full week. These penalties do not apply in case of force majeure, or if the delay is the responsibility of Action Against Hunger.

If delivery does not take place one (1) month after the agreed initial delivery date, the contract will be deemed void. If delivery does not take place two (2) months after the notification by Action Against Hunger of non-compliant or missing products, Action Against Hunger reserves the right to simply cancel the order and delivery of remaining quantities.

24. Invoicing & Payment

24.1 Invoicing

Suppliers submitting an offer will detail the invoicing steps they offer for this contract.

24.2 Payment

All payments will be exclusively made by bank wire transfer on behalf of the supplier, on his/her bank account.

The preferred currency of payment is Canadian Dollars (CAD).

Payment schedule:

Partial payments will occur after the agreed partial deliveries, according to the delivery plan.

In order to claim payments, the supplier must provide Action Against Hunger with the following documents **for each deliverable (stage) as per the delivery plan:**

- One original invoice
- Delivery notes signed by Action Against Hunger Canada Project Manager

25. Intellectual Property

All writings, artworks, computer software and programs, databases, source and object codes and other material of any nature whatsoever produced in whole or in part by the tenderer in the course of their service to Action Against Hunger shall be considered a work made for hire, or otherwise and therefore Action Against Hunger's property. The tenderer will not share, post, repurpose or other re-distribute or reuse any materials produced for the purposes of SMART+. At the conclusion of the work, all materials, documentation, and otherwise necessary information to continue development and administration of the SMART+ suite will be provided to Action Against Hunger by the tenderer in a format designated by Action Against Hunger.

Appendices

Appendix A: Technical Specifications

Appendix B: Supplier Questionnaire

Appendix C: Detailed Pricing Matrix

Appendix D: Bank Certificate

Appendix E: Action Against Hunger's Good Business Regulations

Appendix F: Action Against Hunger's Terms and Conditions of Purchase

Appendix G: Frequently Asked Questions

Appendix A:
TECHNICAL SPECIFICATIONS and TECHNICAL OFFER

Detailed technical specification can be obtained by emailing procurement@actionagainsthunger.ca, with the subject line: “Software Development Services – Development and Maintenance of SMART+”.

Technical Offer format is flexible but should be compliant with the high-level technical details provided in this document, the above-mentioned detailed specifications, as well as any other instructions provided.

Appendix B:
Supplier Questionnaire

Company Name: **To be filled by Tenderer**
Publication reference: **CA-TOR-00004**

Company Name:	
Company Address:	
Contact Name:	
Contact Position / title:	
Contact Details (Phone / Email):	

Company Information:		
1	Where is your company registered? **Please provide a copy of Registration.**	
2	When was it registered?	
3	Is your company part of an international company?	
4	Do you have other offices / plants in the country? Where?	
5	How many employees work for your company?	
Financial Information:		
6	What is your yearly income in CAD over the last 3 years?	
	Last Year (2024):	
	Previous Year (2023):	
	Previous Year (2022):	
7	Please provide audited Financial accounts for the last three (3) years.	
8	Please provide a certificate of solvency issued by your Bank on the bank Letterhead (see template in Appendix)	
Customer References:		
9	Have you worked in the past with Action Against Hunger? Specify the year and activity.	
10	Please provide names and contacts of at least 3 former or current customers: - 1 to 2 Humanitarian NGOs, non-profits and government - 1 to 2 private or public companies To whom you have recently provided the same kind of products / services. Please identify the type of organization (non-profit, government, business, university, etc.).	
Technical Capacity:		

11	What is your core activity?	
12	What other products / services do you offer?	
13	How many web, application designers, or User Experience designers/researchers do you employ? (Please attach an organizational chart.)	
14	Briefly present a similar service that you have recently provided to another customer	
15	How many software development specialists do you employ?	
16	How many staff can you dedicate full-time to SMART+?	
17	Can you commit to a deadline for delivery (with penalties in case of delay)?	
Warranty & Maintenance:		
18	What warranty can you offer on your products / services?	
19	Please detail additional services you offer: maintenance? Service? Technical support? Repair? Please ensure this description aligns with the details of your technical and financial offer.	
20	If so, how do you provide such services?	
Subcontracting		
21	Which products / services do you generally subcontract?	
22	Which products / services would you specifically subcontract in this Action Against Hunger project?	
23	What are the names and Registration numbers of the companies you would subcontract to?	
Documentation:		
24	Can you provide a detailed Bill of delivery for each delivery?	
25	Can you provide a certificate of origin, source, and nationality for each delivery?	
26	Can you provide a certificate of conformity / of Quality?	

Appendix C:
DETAILED PRICING MATRIX

Please use the template provided to submit the detailed pricing matrix in your proposal

To download the template, please click here

Appendix D: BANK CERTIFICATE

Document to be copied by the BANK on its own Letterhead paper.

SOLVENCY CERTIFICATE

I undersigned .....(name).....

Acting in my quality of .....(position in bank).....

On behalf of Bank .....(bank Name).....

Having its registered address .....(bank address).....

And fully authorized to represent it,

Hereby certify that .....(Company name).....

Having its registered office in .....(Company address).....

And legally represented by .....(Company rep).....

Owns a company bank account in our bank agency.

I also certify that this company is solvent, that the company has not filed for bankruptcy and is not in a process of receivership or liquidation.

Appendix E:
Action Against Hunger's GOOD BUSINESS REGULATIONS

These Good Business Regulations are the ground for a professional working relationship between Action Against Hunger and the suppliers.

They are general regulations valid unless others particular conditions are mentioned in the contract. In case of conflicting terms within documents, the conditions of the contract or tender dossier will prevail on these Good Business Regulations.

I. Principles of the procurement procedures

Action Against Hunger has transparent procedures to award markets. Essential principles are
– *Transparency* in the procurement process
– *Proportionality* between the procedures followed for awarding contracts and the value of the markets
– *Equal treatment* of potential suppliers

Usual criteria to select a supplier are:
- Authorisation to perform the market
- Financial and economic capacities
- Technical expertise
- Professional capacities

Usual criteria to award markets are:
- Automatic award (the cheapest offer complying with all requirements)
- Best value for money (price/quality ratio)

II. Misbehaviour, ineligibility and exclusion

Action Against Hunger considers the following misbehaviour as a valid ground for a systematic exclusion of an awarding market procedure and for the termination of all working relationship and contracts:

- **Fraud** defined as any intentional act or omission relating to:
  - The use or presentation of false, incorrect or incomplete statements or documents, which has as its effect the misappropriation or wrongful retention of Action Against Hunger or institutional donors funds
  - Non-disclosure of information, with the same effect
  - The misapplication of such funds for purposes other than those for which they were originally granted
- **Active corruption**: to deliberately promise or give an advantage to an official for him/her to act or refrain from acting in accordance with his duty in a way which damages or is likely to damage Action Against Hunger or institutional donors financial interests
- **Collusion**: the co-ordination of firms competitive behaviour, with the likely result that prices rise, output is restricted and the profits of the colluding companies are higher than they would otherwise be. Collusive behaviour does not always rely on the existence of explicit agreements between firms, but can also be tacit.

- **Coercive practice:** harming or threatening to harm, directly or indirectly, persons, or their property to influence their participation in a procurement process, or affect the execution of a contract.
- **Bribery:** to offer Action Against Hunger employees monetary or in kind gifts in order to gain additional markets or to continue a contract
- **Involvement in a criminal organisation** or any other **illegal activity** established by a judgement, by the US Government, the European Union, the United Nations or any other donor funding Action Against Hunger.
- **Immoral Human Resources practices:** exploitation of child labour and the non-respect of basic social rights and working conditions of employees or subcontractors

Action Against Hunger will exclude from a procurement procedure any candidate or tenderer falling into one of the following cases:

- To be **bankrupt** or to be wound up, to have affairs administered by the courts, to have enter into an arrangement with creditors, to have suspended business activities, to be the subject of proceedings concerning those matters, or are in any analogous situation arising from a similar procedure provided for in national legislation or regulations
- To have been **convicted of an offence** concerning professional conduct by a judgement that has the force of *res judicata*
- To have been **guilty of grave professional misconduct** proven by any means that Action Against Hunger can justify
- To have not fulfilled obligations relating to the payment of **social security contributions** or the **payment of taxes** in accordance with the legal provisions of the country in which they are established or with those of the country where Action Against Hunger mission is operating or those of the country where the contract is to be performed
- They have been the **subject of a judgement** that has the force of res judicata for fraud, corruption, involvement in a criminal organisation or any other illegal activity detrimental to the Communities' financial interests
- To have been declared to be in **serious breach of contract** for failure to comply with their contractual obligations in another previous procurement procedure

Action Against Hunger will not award contracts to candidates or tenderers who, during the procurement procedure:

- Are subject to a conflict of interest
- Are guilty of misrepresentation in supplying the information required Action Against Hunger as a condition of participation in the contract procedure or fail to supply this information

III. Administrative and financial sanctions

In the event a supplier, candidate or tenderer is engaged in corrupt, fraudulent, collusive or coercive practices Action Against Hunger will impose:

- **Administrative sanctions:**

Administrative sanctions are the official notification of the misconduct to the relevant civil or commercial authorities and the immediate termination of all existing working relationships.

- **Financial sanctions:**

Action Against Hunger will request the reimbursement of the cost linked directly and indirectly to the conduct of a new tendering process or market award. If any, the tender or performance guarantee will be kept by Action Against Hunger.

IV. Information of and access for the Donors

Action Against Hunger will inform immediately the Institutional Donors and will provide all the relevant information in the event a supplier, candidate or tenderer is engaged in corrupt, fraudulent, collusive or coercive practices.
Furthermore, the contractors agree to guarantee a right of access to their financial and accounting documents to the representatives of Action Against Hunger's institutional donors for the purposes of checks and audits.

V. Documents to be a supplier

Hereafter is the minimal documentation a contractor working with Action Against Hunger will have to provide:

- Personnel national ID document of the supplier/company representative
- Status and registration of the company
- Mission order or power of attorney authorising the representative to contact

In addition the contractor must have the capacity to issue invoices, receipts and waybills (or delivery notes), to provide a tax clearance certificate and certify documents with an official stamp.

VI. Anti-Corruption Policy

If you believe that the action of anyone (or a group of people) working or volunteering for Action Against Hunger programs is responsible for violating the above rules, you should file a report through the Whistle-blower Email Hotline.

In order to enable the treatment, reports should give as precise information as possible; your name and contact are optional but encouraged. All reports are treated confidentially to the extent permissible by law. Action Against Hunger will use all reasonable efforts to preserve the confidentiality of the whistle-blower and to protect whistle-blowers against any possible retaliation.

Reports are to be sent as follows:

Executive Director: acf-caConfidential@actionagainsthunger.org

Alternatively, a written report may be sent to: Action Against Hunger – Confidential Attn: Executive Director 67 Yonge Street, Suite 1201, Toronto, ON M5E 1J8 Canada

TO BE FILLED OUT BY THE BIDDING SUPPLIER

I, undersigned …… representative of ……..…… certified that I have read and understood these regulations.
On behalf of the company I act for, I accept the terms of Action Against Hunger Good Business Regulations and I commit to achieve the best performances in the event ……..……. is awarded a market.

By signing, I certify that ……..…… has not provided, and will take all reasonable steps to ensure that it does not and will not knowingly provide material support or resources to any individual or entity that commits, attempts to commit, advocates, facilitates, or participates in fraud, active corruption, collusion, coercive practice, bribery, involvement in a criminal organization or illegal activity, or immoral Human Resources practices, such as the use of Child labour or overriding basic social rights and work conditions or the standards defined by the International Labour Organisation (ILO), particularly in terms of non-discrimination, freedom of association, payment of the legal national minimum wage, no forced labour, and the respect of working and hygiene conditions .

Last, I hereby certify that ……..…… is not involved in any pending lawsuit, claim or action in the Company's name, or on behalf of any other person or entity, against the Company, regarding fraud, corruption, bribery or any illegal activity, and has not been convicted guilty of such practices at any time.

All the supplier's responsibilities mentioned in this document extend to any supplier affiliates and subsidiaries.

Name: Date:

Position: Stamp:

Signature:

Appendix F:
Action Against Hunger Terms and Conditions of Purchase

ARTICLE 1: GENERAL PROVISIONS

The following general Terms and Conditions apply to all orders placed by Action Against Hunger with a supplier. The term "order" refers to any Action Against Hunger purchase order or contract.

Upon acceptance of the order, the supplier shall be entirely bound by the provisions of these Terms and Conditions which will prevail over any additional or differing terms in the supplier's terms of sale.

This Agreement may only be varied with the written consent of Action Against Hunger and any specific terms and conditions in the purchase order or contract will prevail over these terms and conditions.

(5) years from the initial delivery date.

ARTICLE 2: DELIVERY

Except if otherwise specified in writing in the purchase order or contract, all orders will be delivered carriage and insurance paid (CIP), or in conformity with the Incoterms 2010 specified on the purchase order.

Goods will remain the sole responsibility of the supplier until the delivery note has been signed by Action Against Hunger or by the forwarding agent appointed by Action Against Hunger.

All orders will be delivered in full, unless Action Against Hunger has agreed to partial deliveries in writing.

All deliveries will be accompanied by a delivery note mentioning the purchase order reference or contract numbers, complete descriptions and quantities of goods delivered, and batch or serial numbers if applicable. Action Against Hunger reserves the right to request additional documentation such as certificates of analysis and/or certificates of origin for goods delivered.

Should the point of delivery be different to the billing address, a copy of the delivery note, and shipping documentation will be sent to the ordering entity at least 24 hours before expedition of the goods.

Action Against Hunger reserves the right to refuse any goods delivered in excess of quantities ordered. Excess quantities will be returned to the supplier at their own risk and cost

ARTICLE 3: DELIVERY TIMES

Delivery times and delivery dates appearing on the purchase order or contract are binding.

If contractual delivery times are not respected, Action Against Hunger may, in accordance with the law, apply late delivery penalties without prejudice to the cancellation clause. These penalties will amount to two percent (2 %) of the total amount of the undelivered goods, excluding taxes, per week of late delivery.

If goods have not been delivered within ten (10) calendar days after the contractual delivery date, Action Against Hunger reserves the right to cancel the order for undelivered goods without notice or payment to the supplier.

ARTICLE 4: COMPLIANCE

A delivery will only be considered as compliant after verification and acceptance by Action Against Hunger. On-compliant goods can be refused, without written prior agreement from the supplier, and returned by Action Against Hunger at the supplier's cost and risks within fifteen (15) calendar days of delivery. After this time Action Against Hunger will be responsible for costs incurred returning the goods.

Action Against Hunger may also demand that the goods be brought up to standard or replaced within fifteen (15) calendar days of receipt of a written request from Action Against Hunger, that the total price be refunded, or the cancellation of the order in its entirety.

All delivery prices include packaging charges. No deposit can be applied to packaging without prior written agreement from Action Against Hunger. If such an arrangement is agreed, details of the deposit will be clearly explained on all delivery slips and invoices.

ARTICLE 5: PACKAGING

The supplier agrees to supply goods and services that comply with technical specifications defined by Action Against Hunger, official standards and, in all cases that comply with good professional practice in the sector in question.

Packaging must be compliant with the quality standards required by the nature of the goods, and their transport, storage and handling, in order that they are delivered in perfect condition.

ARTICLE 6: WARRANTY

The supplier guarantees that goods will be delivered undamaged and free from defects, contamination or unreasonable wear, and that they will comply with their destined usage.

The supplier provides, at no additional charge, a 12-month guarantee (spare parts, labour and travel costs) for delivered goods commencing on the date of acceptance by Action Against Hunger. Any replacement or repair of goods by the supplier will renew the guarantee for a further twelve (12) months beginning on the date of acceptance by Action Against Hunger of the replaced or repaired goods. The

supplier guarantees that any replacement parts will be provided at short notice, and an after-sales service will be guaranteed for five (5) years from the initial delivery date.

ARTICLE 7: DANGEROUS OR PERISHABLE GOODS

The supplier agrees to inform Action Against Hunger of the precautions, instructions, recommendations and applicable restrictions for the transport, warehousing and handling of perishable or dangerous goods.

The supplier agrees to provide all required official documentation for perishable and dangerous goods, particularly for international shipping.
Product expiry dates must be displayed clearly and permanently on packaging. The supplier guarantees that the remaining shelf life of the product at the time of delivery is longer than eighty percent (80 %) of its total initial shelf life

ARTICLE 8: LIABILITY

The supplier is entirely liable for the delivery of goods in compliance with the terms and conditions of the purchase order or contract, and with the laws, regulations, recommendations, standards and good professional practices applicable to the sector.
The supplier is solely liable for any damage caused by its staff or sub-contractors during the execution of the purchase order or contract.
The supplier agrees to hold a valid civil liability insurance policy for the entire duration of their contractual agreement with Action Against Hunger.

ARTICLE 9: ORDER CANCELLATION

Any order unfilled by the supplier or non-compliant with one or several of their contractual obligations may be lawfully cancelled by Action Against Hunger if the failure to comply is not addressed in the (60) calendar days following formal notification by Action Against Hunger by registered mail with acknowledgement receipt.
Action Against Hunger will notify the supplier in writing of the cancellation, which will take effect to the sole detriment of the supplier, and this notwithstanding all damages suffered or incurred by Action Against Hunger.

ARTICLE 10: PRICE

Unless stipulated otherwise by Action Against Hunger, the prices indicated on the purchase order are firm and not subject to change. They include all costs associated with the manufacture, packaging, loading, shipping and unloading of the goods. Prices for goods to be exported outside the European Union do not include VAT.

ARTICLE 11: INVOICING AND PAYMENT

Two copies of all invoices will be issued and sent to the Action Against Hunger office that sent out the order within seven (7) calendar days of delivery.
If several orders are contained in one delivery, a separate invoice will be issued for each order.

All invoices will feature the exact references of the delivery note and the order to which they correspond.
Unless stated otherwise on the purchase order or contract, payments are to be made by bank transfer within five (5) days from the end of the month during which the invoice was received.

ARTICLE 12: ETHICAL AND ENVIRONMENTAL RESPONSIBILITY

Action Against Hunger reserves the right to refuse an order at any time if the supplier or one of its sub-contractors, affiliates or subsidiaries, provided material support or resources to any individual or entity that commits, attempts to commit, advocates, facilitates, or participates or is found guilty of fraud, active corruption, collusion, coercive practice, bribery, involvement in a criminal organization or illegal activity, or Unethical HR Practices. Those practices include the use of Child labour, sexual exploitation or abuse, overriding basic social rights and work conditions, and non respect of the standards defined by the International Labour Organisation (ILO[1]), and ACF policies[2], particularly in terms of non-discrimination, freedom of association, payment of the legal national minimum wage, no forced labour, and the respect of working and hygiene conditions. Furthermore, Action Against Hunger is committed to limiting its environmental impact to a minimum and expects its suppliers and service providers to adopt a similar policy. Action Against Hunger reserves the right to use international supplier' screening tools to check the suppliers record with regards to their possible involvement in illegal or unethical practices.
If you believe that the action of anyone (or a group of people) working or volunteering for Action Against Hunger programs is responsible for violating the above rules, you should file a report through the Whistleblower Email Hotline.

[1] ILO website: http://www.ilo.org/global/standards/lang--en/index.htm

[2] Available on www.actioncontrelafaim.org, www.actionagainsthunger.org, www.accioncontraelhambre.org

In order to enable the treatment, reports should give as precise information as possible; your name and contact are optional but encouraged. All reports are treated confidentially to the extent permissible by law. Action Against Hunger will use all reasonable efforts to preserve the confidentiality of the whistleblower and to protect whistleblowers against any possible retaliation. This article extends to any supplier affiliates and subsidiaries.

Reports are to be sent as follows:
Executive Director: acf-caConfidential@actionagainsthunger.org

Alternatively, a written report may be sent to: Action Against Hunger – Confidential Attn: Executive Director 67 Yonge Street, Suite 1201, Toronto, ON M5E 1J8, Canada

ARTICLE 13: APPLICABLE LAW AND ATTRIBUTION OF JURISDICTION

Action Against Hunger purchase orders and contracts are governed by Ontario and Canadian law. Any dispute between the supplier and Action Against Hunger with regards to the interpretation, execution and cancellation of an order will preferably be resolved amicably. Otherwise all litigation will be handled exclusively by Toronto, Ontario, Canada.

SMART+ Technical Appendix

02 May 2025

This Technical Appendix contains information, including specifications for software, considered confidential by the SMART Initiative and Action Against Hunger Canada. By continuing to use this document, you and your organization agree to: use these specifications in good faith for the sole purpose of submitting a proposal to provide software development services to Action Against Hunger Canada and the SMART Initiative; not disseminate or publicize the contents of this document.

SMART

Contents

SMART+ Overview

Goals of SMART+

The SMART methodology is currently thriving and is a trusted initiative among users in the context of nutrition. Nevertheless, the highly structured data collected during SMART surveys are largely stored on private computers or as email attachments, and not available to organizations or researchers in a standardized form. This impedes the development of the ecosystem around SMART+, and the understanding of SMART data as a larger whole.

The goal of SMART+, a project led by the SMART Initiative hosted by Action Against Hunger Canada is to enhance the ease of data collection for the users; to ensure that data is collected in a standard manner in accordance with the statistical rigor of SMART; and to provide a centralized platform to upload, store, analyze and share SMART data. These specifications describe a product intended to meet these goals. A wide array of users were consulted during the design process with the goal of creating a software system that will see wide adoption and fulfil all the goals of SMART+ listed above.

Historical Overview of the SMART Technology Landscape

Previously, the SMART methodology was not fully digitized and there was no centralized software tool, SMART users employed a variety of technologies to collect, analyze, and report SMART data. Below, we provide a high-level overview of these tools and how they relate to SMART+.

ENA

The centerpiece of the SMART technology landscape was the Emergency Nutrition Assessment (ENA) software[1]. This was developed by a single developer for the Windows platform and provides support for a full range of SMART survey needs, including sample calculation, an extremely rigorous plausibility report for evaluating SMART data, and an input interface for both nutrition and mortality surveys. Users have stressed the high value and capability of the ENA software, and **SMART+ kept all ENA's functionality for its users, albeit in new software.**

[1] https://smartmethodology.org/survey-planning-tools/smart-emergency-nutrition-assessment

Other Analysis Tools

While ENA is a powerful tool for the SMART indicators, users often needed to run additional analyses in external software. One popular option for this was EpiInfo, an epidemiological analysis tool released by the Center for Disease Control and Prevention (CDC). There is a version of ENA combined with EpiInfo known colloquially as EpiENA; however, this relies on an old version of EpiInfo that does not contain many enhancements of the current version (7.2). As such, ENA and EpiInfo are often used separately. Additional tools that are commonly used are the standard statistical toolkits – MSExcel, SPSS, and Stata, in some cases as well as modern visualization tools such as Tableau or PowerBI, though these are confined to larger organizations. **Currently, manual file manipulation is needed to adapt ENA data to EpiInfo, SPSS, or other data formats, SMART+ handles export to these in a seamless manner, reducing user workload.**

Data Collection

Currently, data collection for SMART is performed in a variety of ways. The most common digital collection tool is OpenDataKit (ODK), with Ona and Kobo also being mentioned. In some cases, however, surveys are conducted on paper due to local factors such as security or financial concerns; in these cases, survey results were manually inputted into spreadsheets, which were then imported into ENA. As ENA was developed before these data collection tools were available, it is not directly compatible with them, and users must manually rearrange some of their columns to make them ENA compatible, though standardized ODK templates make this easier. **SMART+ seamlessly transitions from data collection to plausibility analysis to aggregation, while retaining established interfaces.**

Anthropometrics and Artificial Intelligence

Currently, there are several tools in development that could augment the collection of anthropometric data for SMART, including Child Growth Monitoring (CGM) and SAMphoto. These aim to either collect anthropometric data using analysis of images or 3D models or create an entirely new way of measuring nutrition without direct reference to the existing anthropometric measurements, such as middle upper-arm circumference (MUAC), height, or weight. While these are all still in development and undergoing testing, **SMART+ software should remain open to being compatible with digital assessment tools in future phases of development.**

Summary of the Current SMART+ Software Suite

The minimum viable product (MVP) for SMART+ was field tested in late 2022 in South Sudan and Kenya. Following its successful implementation, the SMART Initiative launched the SMART+ digital infrastructure in April 2023 for public use. SMART+ suite consists of four related software tools. These tools work seamlessly together to deliver a complete nutrition monitoring solution. With SMART+, users can plan their survey, train their enumerators, implement the survey in the field, monitor data as it is collected, analyze data, and share it with interested parties. These tools are:

SMARTCollect: An offline and open-source mobile data collection app for household data collection and standardization tests. It enables streamlined and standardized data collection with results directly uploaded to the platform.

SMART+ Platform: A centralized survey management tool for planning, monitoring, and administering surveys. It enables real-time tracking of data collection progress and instant analysis of anthropometric and mortality data.

SMART+ Aggregator: A centralized, web-based, global repository that stores data from all SMART surveys. Users can view and download data from selected surveys, improving information dissemination to key stakeholders.

SMART+ Dashboard: A publicly accessible tool for live visualization of global SMART survey results and training. It features an accessible geographic view of nutrition situations down to the sub-national level, facilitating decision-making for key stakeholders.

SMART+ ensures the security and protection of data and was designed in consultation with experts from the Global Nutrition Cluster, U.S. Centers for Disease Control and Prevention, SMART Technical Advisory Group, and Integrated Food Security Phase Classification. It improves upon the current SMART Methodology by eliminating cumbersome manual methods, increasing accuracy, standardizing indicators, automating analyses, and facilitating the identification of needs and access to services. SMART+ automatically analyses not only malnutrition and mortality indicators but also household food security, hygiene, child morbidity, and women's health indicators.

SMART+ promotes the open sharing of information. Its roll-out fills a critical gap, the lack of a global repository for SMART assessments. The SMART+ Aggregator acts as a repository for datasets, summary results, and SMART survey reports. To date, 123 surveys have been uploaded to the Aggregator by 19 organizations, across nine countries. Through the use of SMART+, agencies and governments can obtain real-time, population-level malnutrition data that enables faster, more targeted action and facilitates collaborative and coordinated responses and programming.

General Technical Specifications

Reliability

Users depend on SMART+ to inform life-saving interventions across the world in some of the most challenging contexts. As a mission-critical piece of software, the SMART+ suite of tools must be extremely reliable. All aspects of SMART+ must perform consistently and correctly for the user,

regardless of their environment. This should be achieved through extensive testing of all functionalities, including statistical routines, as well as rigorous user experience testing.

Security

SMART+ software should be highly secure to protect survey respondents' confidentiality, privacy, anonymity, and safety. Humanitarian ethics include a "do no harm" philosophy, which requires organizations to protect respondents and staff from any negative consequences that may arise through SMART activities. As such respondents' and users' personal information should never be placed at risk of discovery by unauthorized or malicious use of SMART+ software or products.

Offline Use

SMART+ software, specifically the mobile application, should work offline as well as online. Given the challenging environments in which SMART surveys are deployed, alternative ways of connecting devices will need to be available (e.g., Bluetooth). The challenges of connectivity also apply to synching data and updating software and should be considered in the design and development process.

User-Friendliness

All software should work well for the intended SMART+ users (see User Profiles). SMART+ interfaces closely mirror already successful tools like ODK and ENA. Software should work on a variety of devices to enable SMART users to deploy surveys on available hardware. Moreover, SMART+ serves as a single suite of tools for a complete malnutrition survey process, from training survey teams through to data collection, analyzing survey results and sharing summary statistics with other stakeholders. Software updates should be automatic and have no negative impact on the user experience.

Extensibility

Innovations in the field of malnutrition monitoring are emerging, particularly in the areas of mobile and digital assessment of nutrition indicators. SMART+ should provide a means to integrate new tools (see Anthropometrics and Artificial Intelligence) into the assessment process via hardware or API interfaces.

Phase II of System Development

SMART+ has completed Phase I of development using an agile and iterative process that incorporates feedback directly from users in the field. The initial specifications for SMART+ are presented in **Annex 1** along with detail on the users of SMART+. Phase II of development will focus on expanding the analytical capacity of SMART+. The SMART Initiative seeks to implement the following features in the next stage of development:

1. The automatic analysis of secondary data and indicators without having to complete the survey set up process on the SMART+ Platform. There will be the inclusion of an option to 'Analyse Secondary Data' that can be selected from the initial landing page. Users should be able to import previously collected data for analysis from multiple file types (e.g., .xls, .csv, etc.).

   Outputs from the imported data should populate the 'Results' section of the Platform but not be pushed to the SMART+ Aggregator. The automatic analysis will only be available for the core anthropometric indicators and will generate graphs and statistical outputs. The desired output for the secondary analyses will mirror the output in **Figure 1**.

Figure 1. Results output in the SMART+ Platform

2. Automatic analyses for additional anthropometric indicators. Existing code should be replicated for visualization on the results pages of the Platform and Aggregator (**Figure 1**) for two new continuous core anthropometric indictors. These indicators will be calculated using inputted anthropometric data that have been collected for the existing core indicators. The inclusions of these indicators will also require updating of existing quality control checks/reports and outputs for each indicator.
3. The inclusion of additional food security indicators to the SMART+ Platform questionnaire builder. This will include their addition to the indicator bank, their automated analysis, and results export to summary forms and survey reports.
4. Updating existing graphics, functionalities, and report templates/outputs based on feedback from existing users.

System Maintenance

Proper upkeep of the SMART+ infrastructure is required (SMARTCollect, Platform, Aggregator, and Dashboard), with a special focus on the following tasks:

- Resolving data entry tech debt tickets and bug fixes.
- Implementing missing backend API integration tests.
- Implementing missing Snapshot tests on the platform frontend.
- Implementing missing Unit Tests on the platform frontend.
- Optimizing database queries.
- Refactoring the Survey Update endpoint.
- Implementing functionality to calculate, store, and update anthropometric indicators.

Itemized List of SMART+ Software Requirements

Development

1. Inclusion of a selection option for secondary data analysis on the survey manager landing page of the SMART+ Platform.

1.1. Option to bypass the survey planning process and use the tool to complete the automatic analysis of core indicators.

1.2. Safeguards to ensure that analyses from secondary data are not synced to the SMART+ Aggregator and Dashboard.

2. Inclusion of automatic analyses and visualizations for two additional anthropometric indicators.

2.1. Generation of MUAC-for-age z-scores based on input mid-upper arm circumference data and the reference WHO growth charts.

2.2. Generation of BMI-for-age z-scores based on input weight and height data and the reference WHO growth charts.

2.3. Generation of plausibility checks for these indicators, outlining flags, SD, normality, skewness, and kurtosis as already completed for the other core indicators.

2.4. Inclusion of these data in the report outputs, summary exports, and visualizations on the Aggregator.

3. Addition of new food security indicators to the SMART+ Platform questionnaire builder.

3.1. Generation of automated, standardized analyses for these additional indicators based upon available guidelines.

3.2. Export of results from new food security indicators to summary forms and reports.

4. Adjusting existing code based on report template updates.

4.1. Minor graphics and functionality updates, as needed, based on feedback from users in the field.

Maintenance

1. Resolving data entry tech debt tickets and bug fixes.
2. Implementing missing backend API integration tests.
3. Implementing missing Snapshot tests on the platform frontend.
4. Implementing missing Unit Tests on the platform frontend.
5. Optimizing database queries.
6. Refactoring the Survey Update endpoint.
7. Implementing functionality to calculate, store, and update anthropometric indicators.

Questions and Clarifications

Instructions for requesting clarification on these specifications are provided in the accompanying RFP document.

Annex 1. Specifications from Phase I and the Minimum Viable Product

System Design

This section describes in detail the specifics of each tool in the SMART+ suite. Each sub-section begins with an overview of the specific component. A workflow section describes the expected user experience and desired features, after which further technical specifications are listed as necessary.

Platform

Overview

The platform is the central tool that allows Survey Managers to create, plan and administer surveys, receive and share results. Survey Managers define the parameters of the survey they want to administer and add Enumerators to it, who receive the survey through the SMART+ mobile collection application. Any data collected by Enumerators is shared with the Platform. The Platform also contains all the functions of ENA (Emergency Nutrition Assessment) to analyze and evaluate data and to conduct plausibility checks. Many of those functionalities are already present in ODK and ENA (both of which will be embedded on the Platform), and it is important that all functionalities of ENA are transferred to the new system. The platform is also able to integrate historical data that were previously shared by ENA users (in AS file format).

Workflow

Survey Managers log in to receive access to the Platform, where they can manage their existing surveys, or create new ones. They can access the functionalities of the platform via a web application, a desktop application, or a mobile application. Both desktop and mobile versions should work offline as well as online. Web, desktop, and mobile versions should be available on all types of operating systems/browsers/platforms, but especially commonly used versions of Windows and Mac (desktop), and Android (mobile) platforms. Both the functionality and the user interface are consistent across all channels.

Survey Managers will assign their survey a name, and decide whether it will use the anthropometric survey, the mortality survey, or both. They should also select a country, so that the mobile applications are aware of which locations are needed. Once a country is selected, the location dropdowns will be automatically populated by the three levels of UN-standard subregions for the country selected; the user will however have the capacity to add their own locations. The user will also be asked to specify for which agency they performed the survey.

In addition to this, the user will be able to add the survey to a survey set; this is intended for users who conduct the same survey multiple times and want to compare historical data; this is expected to be especially common for government SMART users, though it can also be used in emergencies. The survey set will be a variable that is available for data visualization in the Aggregator.

By default, the user that creates a survey is automatically assigned to the Survey Manager role on that survey. They can, however, add other users to be additional Survey Managers. All Survey Managers have the same rights on the application and should have a means to avoid overwriting one another’s data. All changes to surveys should be logged, providing a clear data chain of custody.

For designing surveys, users currently rely on a suite of analytic functions of ENA. For example, ENA calculates sample sizes and clusters depending on a range of parameters that are typed into the form. The precise calculations underlying these forms are not codified, and the first task of the project will be to generate an exhaustive list of these calculations. The whole suite of well-

established ENA functions should be maintained in SMART+, as they are currently used successfully in the field.

Some improvements to ENA's functionality will also be necessary. Some of these have been identified through user research, while others will emerge in the user acceptance testing phase. Examples of known issues include: compatibility with iOS, German-only error messages, and difficulties in copy/pasting. There are also a range of new features requested by users (such as an assessment of combined Global Acute Nutrition based on a diagnosis that uses MUAC and Weight for Height) that will have to be collected and added. Any further modifications to the functions should be closely aligned with people working in the field.

In terms of user friendliness, any improvements that go beyond cosmetic improvements and that alter the structure of the interface should be carefully weighed against the possible consequences of producing a system that is unfamiliar to users. While there are certainly substantive improvements to be made to ENA's user interface, it should maintain its general architecture where possible.

Within the same interface, the Survey Manager can then create/modify a survey template using an embedded version of ODK Build, which is already being used in the field. The interface should maintain the overall structure of the user interface of ODK, because it is a well-established application, and users are familiar with it. It is important that every survey created has an immutable core of either anthropometric or mortality questions, as the SMART methodology relies on standardized data.

Questions can be added to the end of the survey using the ODK Build function, but these questions should be separated from the rest of the survey on the interface through visual or other means. Further indicators can be accessed from a list of pre-defined questions, or uploaded as a spreadsheet (provided they are in the right format). Additionally, the survey should include a parameter to define what percentage of survey responses will automatically be sent back to the Enumerator for checks.

The Survey Manager can distribute the survey among Enumerators through integration with SMART+ collect mobile application (see SMART+ Mobile Collection Application). Mobile devices are added to each survey via either the Bluetooth integration of both mobile apps, or else by generating a unique code that can be typed into the SMART+ collect mobile application by the Enumerator. The Enumerators are not mentioned by name, merely by device ID, to protect their privacy.

When the survey is planned, the Survey Manager has several options for distributing it among the Enumerators. A window will suggest a default distribution, which evenly distributes the number of households among the Enumerators based on the minimum sample size estimated by the sample size calculation, but the Survey Manager can change the total number of households as well as the distribution among Enumerators. If further devices are added to the survey later, the survey is distributed to them manually via the same interface (if the remaining numbers of responses changes for existing Enumerators, this change will be synchronized on the SMART+ collect mobile application and the Enumerator will be notified). Through this mechanism, the Survey Manager can continue adding Enumerators and further households/children to the survey.

When a Survey Manager receives survey responses from an Enumerator, they will have to validate those results. Responses will be added to the survey results once they are approved by the Survey Manager. Otherwise, they will be rejected (but not deleted). Each survey result comes with geolocation and timestamp, to allow the Survey Manager to know how long the survey took, and where it was taken. Both these functions can be turned off depending on the security situation in the survey area.

If possible, there should be an underlying rule that tests whether the survey response was recorded in the cluster allocated to the Enumerator, or outside the cluster.

Each survey result also comes with a line that specifies how many children under 5 years of age were identified in the household, how many were measured, and what the comments were for each non-measured child. If the Survey Manager wants to understand where the measurements were taken, they have the option of viewing the survey results on a map (based on the geolocation of each survey response), with different teams being coded in different colors.

Other information available on survey results (not necessarily on the inbox screen, but potentially on an info popup box:

- Cluster number (n/a if not cluster sampling)
- Whether the household consented/refused/absent
- Number of children measured/refused/absent of total eligible children in household

Survey results can also be typed in manually, in case users are working on pen and paper survey forms. In this case, the above information (cluster number and children/household refusal/consent/absence) needs to be typed in manually.

At any point during the survey, the Survey Manager can use the analytic features of ENA to interpret the results (plausibility check, prevalence rates, etc.). At the bottom of the screen the survey manager can see for both household and children, what percentage of total consented/refused/were absent relative to the total number of households in sample size/number of children eligible. ENA contains a standard, exportable report template with the most important insights. This report needs to be available on both the web, the desktop and the mobile version (including offline), as a Survey Manager is expected to run plausibility reports while the survey is ongoing. Note that for ENA functionalities, only the core SMART survey is considered, not the additional questions introduced by the Survey Manager.

When the Survey Manager wants to close the survey, they can set its status to completed. At this point, they will have the choice to share data with the Aggregator (they will still have this option later, but at completion they will be explicitly prompted, and they cannot share a survey with the Aggregator before its completion). Before any data is sent, a window gives the Survey Manager a range of options.

First, they will have to confirm that they have reviewed the plausibility checks, and that their data meets SMART standards. They will be notified that the plausibility report will be sent to SMART staff with the data and might be checked. Second, they will have several options for sharing the data. They can choose whether they want to share the summary results (the platform needs to

contain a function that automatically extracts summary information from the survey) or the raw data. Sharing the raw data means that all data is shared, including data from standardization tests and planning data. They can also choose who to share the data with: just their own country, or globally (see Aggregator for more detail on sharing options). Any data sharing needs to share the summary statistics of the survey with the global Aggregator, to encourage the sharing of data. Third, they will have the choice of only sharing the core SMART data, or also sharing the other indicators they collected.[2]

Once survey data has been shared, it cannot be 'un-shared'. However, users can expand or modify their sharing at a later stage. They can share raw data as well as summary statistics, and they can share the data globally rather than locally. It is important that the data is not duplicated in that case. Each shared survey should come with a uniquely identifiable stamp that allows it to be replaced, should the same survey be share more broadly after a first share. Other equivalent solutions are acceptable. For example, if the Survey Manager first shares data on a national level, then later receives consent to share the data on a global level, they can return to the Platform to change the sharing status.

Further functionalities

Security

1. *Password encryption*

   Passwords need to be stored on servers using 256-bit encryption, equivalent or superior industry standard.

2. *Encryption*

   All data needs to be encrypted on the device, and while in transit, and uploaded only when a secure connection is established.

3. *Authentication*

   To ensure that API requests come from trusted and verified sources, an authentication protocol such as OAuth2.0 must be implemented.

4. *Two-factor Authentication*

   To add an additional layer of security, two-factor authentication should also be implemented as appropriate.

5. *Virtual Private Network*

   Data on the platform should be hosted inside a Virtual Private Network (VPN), or equivalent solution, and only accessible through the API with proper authorization.

[2] The distinction between SMART core data and further indicators should be built in a flexible way, as there might be changes to the SMART indicators, and a similarly rigorous methodology might be applied to other indicators.

6. *Backups*

   All data should be backed up daily.

7. *HIPAA and GDPR Compliance*

   The server (cloud platform) leveraged for providing the required services should be compliant with HIPAA and GDPR. In the current design, no data is identifiable, so many of these regulations do not apply - however, compliance needs to be kept in mind consistently if the design changes or if regulations change.

8. *Automatic Deletion of Cached Data*

   The app-allocated cache, and all other stored data should be automatically deleted after a set time period (e.g., 30 days) has passed.

Web/Desktop/Mobile Application

The Platform can be used via three different channels, each of which fulfils a specific role. The mobile application has an offline function that allows it to be used in the field, and it can connect to the SMART+ Collect mobile application via Bluetooth. The desktop version has a manual data entry field that can be used to transcribe pen and paper results when there is no internet connection and phones are not allowed in the field. All the above automatically synchronize with the web version (though automatic synching can be turned off to prevent data charges).

Standardization test for training

One standard survey that is saved on the platform and that can be used by each Survey Manager on any given survey is the standardization test used to evaluate Enumerators. It will ask the Enumerators, including the Supervisor (i.e. Enumerators who are experienced at taking measurements), to undertake 2 measurements of 10 children, to test how close the Enumerators got to the Supervisor, and to test the variance of the Enumerators' measurements. The Supervisor will input their measurements through the mobile collection application. One of the devices will be designated 'Supervisor' on the list of devices associated with the survey associated with the standardization test. The analysis and the scoring are done on the platform and the calculations are currently part of ENA.

Access

The application can be downloaded freely, and Survey Managers can create surveys. Logins require a username and password. Data quality assurance will be applied through data validation at a later stage.

Number of users

The Platform is expected to have around 500-1000 active users.

Hosting

Under ‘Settings’, users have the option to change the way that their survey data is being hosted (see Aggregator). There are three different options for hosting data. These are linked to the profile, not the application – if the user selects a hosting option on the mobile device, this will be the setting for their account on any desktop version they might be using (or on the web app).

The default option is that all survey data is stored securely on Action Against Hunger Canada servers. This allows users to access their data from any device on the web application. The data is not accessible to anyone else prior to being shared. As some users might face constraints in terms of where they can host their data, SMART+ offers two further options for hosting data: local and custom.

If users choose ‘local’, then their data will be stored on their local device only, and not hosted on any server whatsoever. It will be synchronized across their desktop and mobile applications, but not stored centrally. This implies that survey data cannot be accessed from a new device, unless another device on which that data is stored is currently online (for example, if a Survey Manager wants to log in to their survey from a new computer, their data will not immediately be available, unless their mobile device is on and able to share the data with the new computer). This option is important to give users maximum control over their data.

If users choose ‘custom’, they can share data with a server of their choosing. The process for a custom server setup should be well documented, with example setup scripts as necessary. It should be noted that in this case, ACF does not assume responsibility for the security of the chosen server.

SMARTCollect Mobile Application

Overview

The SMARTCollect mobile application is the tool used by Enumerators in the field to collect and input data, and it is directly integrated with the platform. Survey Managers thus remotely execute surveys and steer their Enumerators through it. Enumerators need to be able to use the application without additional technical expertise and should have no ability to change the structure of surveys. The application needs to function in the settings in which it is usually deployed – including locations with intermittent or poor internet connectivity, on a variety of mobile devices, and in multiple languages and writing systems (e.g., Latin, Arabic, Hindi).

Workflow

Users can download the application freely and create a profile. In order to connect with a SMART+ survey, they need to be added to an existing survey by a Survey Manager - either by connecting to the mobile application version of the Platform via Bluetooth/cable, or by typing in a unique code generated by the Survey Manager on the Platform.

Once they are added to a survey, they will be able to access its fields, and see how many households/children are left to collect. The survey form should stick closely to the ODK Collect user experience, as it is a popular application with a very intuitive interface.

Their survey begins with a consent form, to be signed by the survey respondent. If a household is marked as absent, it is saved under 'absent households' and can be revisited at a later stage from the main menu. Consent can be given digitally, or in writing (in that case, a picture has to be attached to the survey response - ideally in BW with medium resolution, to save data). The survey includes a question about the area and the cluster, in order to satisfy SMART methodological considerations. After the household section has been completed, the survey automatically adapts the later forms by adding a section for each child under 5, generating a unique non-personally identifiable ID for each child in the survey, and prompting the Enumerator to take measurements. For all children under 5 that do not have measurements, the Enumerator is prompted to add a comment in a text box. Those elements of the survey that are not part of the SMART core survey are not visually distinguishable from the core survey on the mobile application. The application contains rules currently embedded in ENA that check data for their plausibility. If a measurement or a data entry is ruled implausible, the Enumerator receives an automatic prompt to retake the measurement. Random prompts to re-measure are also built-in to the survey itself with the Survey Manager being able to manually change the frequency of random re-measurements. The Enumerator does not see whether the re-measurement is due to implausibility or due to a random prompt.

Once an individual survey is finished, it can be shared with the Platform. This happens either automatically, via the internet, or manually, via Bluetooth. The automatic synching option can be turned off to prevent data charges.

The mobile collection application should also have a way to connect to external applications on the device, such as one of the digital body measurement scanning apps being developed. This feature in particular should be well documented so that additional measurement tools can be added to SMARTCollect by developers in the future. The precise integration into the user journey will be determined by how exactly the software functions, but in any case two options should be included: 1. Manually filling in the measurements, 2. Scanning the child using an app and having the measurements be automatically populated on SMART+ mobile collection app - if the enumerator chooses this option, he will be directed to the scanning app, and once he agrees to the measurements taken there, they are automatically filled into the relevant fields of the SMARTCollect app.

In some instances, the Platform will interact with the mobile collection application (beyond adding them to the survey). When any parameter of the survey changes, those changes are synchronized on the application.

Further functionalities

Security

1. *Data storage*

   All data from surveys is stored locally on the device. Once a survey is closed by the survey administrator, the data is deleted from the device. The Platform can also remote wipe the device in case it is lost or stolen. A set period (e.g., 30 days) from the moment a survey is completed or there has been no login to the account, all data is wiped from the device.

2. *Password encryption*

   Passwords need to be stored on servers using 256-bit encryption, equivalent or superior industry standard.

3. *Encryption*

   All data needs to be encrypted on the device, and while in transit, and transferred only when a secure connection is established.

4. *Single device*

   A user may only be signed into the mobile collection application on one device at a time. If they attempt to sign in on a second device, they will be given the option of aborting the process, or automatically signing out from the second device. This second device will be automatically signed out at its next synchronization with the web server; the check for signing out should be performed automatically when there is a connection regardless of the user's synchronization settings.

5. *Privacy*

   SMART+ cannot hold any identifiable data in the Aggregator and must ensure Survey Managers do not contribute identifiable data by accident. This means that not only can names and ID numbers not be collected, but any identifiable biometric data such as photos of faces, fingerprints, or identifiers that reference the respondent directly – must be stored without reference to the subject. In the case where data is collected which may identify respondents, it should be suitably anonymized with techniques such as hashing, generation of random identifiers, or equivalent methods once transferred to the platform. For example, GPS traces and timestamps will need to be anonymized so they cannot be used to identify households (e.g. GPS data anonymized once received on the platform using a randomized offset from the actual position of sufficient distance that it could not identify an individual household).

6. *Altering data*

   For every household, the survey will be considered 'in progress' until the Enumerator finalizes it. The Enumerator will have the ability to modify any data while the survey is in progress; however, any change made will be recorded by the application and submitted along with the results so that there is a full record of data changes to prevent fraud.

Training mode

The survey can be put on training mode by the Survey Manager. This means that Enumerators take measurements, and those results are synchronized with the Platform, but not added to the survey results. Instead, they are shown in the training section (that currently exists in a similar form in ENA). Through the training mode, Enumerators can be tested, and the accuracy of their measurements evaluated.

Offline functionality

Data collection must be possible in offline mode.

Geolocation and timestamp

The application should maintain the geolocation and timestamp functions of ODK Collect (subject to all relevant concerns about privacy/confidentiality and security).

Translation

The application should allow for translated SMART forms. As Enumerators may not speak English, the SMART survey should be available on the platform in several languages (e.g., using available ODK translations saved as separate forms). This includes languages that use non-Latin scripts (e.g., Arabic, Bengali).

Number of Users

The software should scale easily to accommodate both large (several hundred to a thousand) and small (dozens) survey teams.

Further technical specifications

Built on OpenDataKit

Due to the familiarity of users with the existing OpenDataKit (ODK) [3]. technology, the application should be built on the same technology. The SMART surveys should be stored using ODK's

[3] OpenDataKit has become the most popular software toolkit for data collection. It is very modular, supports a wide variety of question types, and has received wide adoption in the humanitarian and development fields; almost all SMART users reported familiarity with it. ODK software can be hosted on private servers with the software for synchronizing these servers with the mobile application already provided.

OpenDataKit is a set of tools, for which the most relevant for us are ODK Collect and the XForms specification. ODK Collect is a mobile application for the Android mobile operating system; it is designed to

XForms specification, and all questions from the SMART data should be displayed using the standard ODK JavaRosa library. The results must be stored in the same folders as they would be if the user was using the standard ODK application.

Enumerator Identification

The application will automatically identify the Enumerator using the device ID (e.g., Android handset ID); the team will be known based on synchronization with the Platform. The cluster variable will be displayed only if a cluster survey was selected.

Aggregator

Overview

The Aggregator is a centralized, web-based repository for storing global SMART survey data as well as selected metadata on surveys. It collects data sent through the platform and gives access to years of data to its users. The data collected in it also constitutes the data foundation for the dashboard.

Workflow

The Aggregator is a database hosted on a central cloud administered by Action Against Hunger Canada. It consists of all the data currently or previously shared by users of the Platform. It is hosted on the same server as the Platform's data, but with strict access rights (before being shared, the data does not lie on the Aggregator). Therefore, the Aggregator should not be confused with the Platform's database.

It has a user interface that somewhat resembles the Platform to make it easy to move from one tool to the next. Data is shown in the same format as on the Platform, and the same analytic tools available on the Platform are also available on the Aggregator. While the Aggregator contains none of the survey planning tools of the Platform, it contains some additional functions for working with data: data can be filtered by location and period, as well as by survey (those data points are meta data that is a feature of the survey, rather than its content), and there is a search function within the filter that allows users to quickly access individual surveys by typing keywords into the relevant column (e.g. the name of a subregion into the subregion filter).

run on even the oldest phones still in circulation, as well as tablets. It has full support for offline data collection, and SMART users have reported that they have not had difficulties training student Enumerators to use the application.

XForms is the ODK standard for describing the content of forms; it has robust support for rules on input fields and random re-collection to ensure data quality. Crucially, it is a well described and well supported format that can easily be read and understood by other software. ODK, being open source and very well documented, should serve as a foundation for a more targeted and user-focused application like SMARTplus.

Furthermore, basic metadata statistics can be viewed for all data currently filtered. For each survey, there is information on all data that was present in the original survey (planning and standardization test), in the same format as on the Platform (clicking on an individual survey leads one to a screen that looks identical to the survey planning screen, except that no parameters can be changed) and also on:

- Country
- Agency (two datapoints - one automatically pulled from the profile of the user, one that is asked explicitly at the beginning of each survey, as sometimes consultants or freelancers conduct surveys on behalf of agencies).
- Contact information of Survey manager (automatically pulled from profile)
- Start of survey and end of survey (month and year, automatically pulled from earliest and latest entry in responses).
- Design of survey (cluster random sampling, simple random sampling, or exhaustive sampling)
- Month and year of submission to aggregator

The Aggregator is administered by 5 users, representatives of four core regions of SMART, plus a senior project manager[4]. These administrators are responsible for managing access rights, and for validating any surveys that are transmitted to the Aggregator from the Platform within their respective regions. Full administrators can give restricted admin rights to other SMART staff. For example, Toronto-based staff might have full admin rights, while regional staff might have partial admin rights. Once a survey is validated, it is automatically added to the pool of surveys. Surveys can be manually removed from the aggregator. This is an important function in case a survey manager prematurely uploaded the survey (then they can contact the administrators, get the survey removed, and upload a new version of it).

Access rights are strictly managed, to ensure that users only have access to the data that they have the right to view. Overall, there are two different levels of restrictions: global data is shared with all users of the Aggregator. National data is only visible to users from that country. For the national group, SMART+ will include a profile for the chair of the national assessment working group, who is either a representative of the ministry of health or the cluster coordinator. This profile will manage access to the groups data hand in hand with the Aggregator administrator from SMART staff, as well as validate any data that is shared with that group (in many cases, national validation is a prerequisite for global sharing). SMART team members will conduct random checks to see if data is likely to have been validated (based on plausibility report results), if not, then regional SMART advisors will contact Survey Managers and asks for validation otherwise the data will be wiped from the Aggregator.

[4] These 5 administrators reflect the current organizational structure of SMART and might change in future. In this case, the administrator rights would need to change, too.

As mentioned in the Platform section, users can only store their SMART survey data on the Aggregator if they share summary data.

The Aggregator has a user interface that is built like a table with columns, to make it easier to read and navigate.

There are search functions that allow the user to filter for years and locations (if they have access). Furthermore, all analytic features of ENA are available on the Aggregator.

Users who have permission to view data can also download it in spreadsheet or in raw format. Users with API permission (granted by SMART administrator) can pull data from the SMART system in an automated fashion via a standards-compliant API in JSON format or as aggregated data (table format).

Further functionalities

Number of users

We expect there to be around 25-50 active users of the Aggregator

Cloud Hosting

The service should be hosted on a cloud (e.g., AWS). The hosting platform should offer a high degree of security, scalability to handle increased traffic during emergencies, and regular backups. Data and backups should be hosted in a single jurisdiction (preferably the same as Action Against Hunger Canada) to minimize compliance risk arising from multiple data protection regimes.

Security

1. *SSL*

   It is imperative that the web-based components use Secure Sockets Layer (SSL) for all webpages.

2. *Multiple Reads*

   The database should allow multiple reads at the same time.

3. *Backup*

   All data should be backed up daily.

Privacy

Because of the importance of privacy, no user should be able to contribute to the SMART+ aggregator without signing terms of use that ensure that they do not collect private data in their additional indicators. If they do not agree to this, only their SMART data will be aggregated, and their other indicators will be kept locally for their use according to their own data privacy practices.

Data format

The Aggregator needs to store data in a format that is compatible with ODK XForms, as this is the data that will be imported into it from the Platform.

Certification/Audit

At the first stage of software development SMART+ will not pursue data certification. However, should the need arise in the future, the Aggregator should be compliant, or easily made compliant with relevant standards such as DRAMBORA.

Further technical specifications

Size of Data

At present, SMART data is generally of modest size. For example, a recent country-wide SMART survey in Tanzania created 17,000 records, and surveys at this scale are run annually or semi-annually. Nevertheless, the SMART+ suite should easily scale to larger datasets and/or a larger number of users.

Dashboard

Overview

The Dashboard is a publicly available and automatic visualization of the global results of SMART surveys. It is hosted on the Global Nutrition Cluster website and gives users the opportunity to understand the state of nutrition at a national and sub-national level at a glance. Some guidelines for orientation are NutriDash, the Kenyan Ministry of Health's nutrition portal, The State of Acute Malnutrition

Workflow

The data that goes into the visualizations is automatically synchronized from the summary data on the Aggregator, giving users the latest data on the state of malnutrition across the world.

The visualizations themselves are high-end and easy-to-use, as they are targeted at non-experts. They should give an overview of the state of malnutrition and mortality according to a range of indicators, by region and by year. They should be able to manipulate the key variables (time, geography, indicator) and export their graphics to common formats (e.g., PDF, TIFF, PNG, SVG, HTML).

The precise content of the dashboards is yet to be determined in an Action Against Hunger Canada/Global Nutrition Cluster workshop, which the provider will attend. It will include the prevalence of malnutrition, the caseload and mortality rates at the national and subnational level, viewable by years. In addition to that, further indicators might be added, or further levels of detail (e.g. confidence intervals).

Wireframes and User Journeys

This section provides a description of the user experience through a collection of user journeys and wireframe graphics. The SMART+ suite developed by the provider should follow these guidelines, subject to any modifications agreed between the provider and Action Against Hunger Canada in the course of development.

Platform

Login Page to Survey Landing Page

Users who open the application via mobile or web desktop have the option of logging in, registering, or resetting their password. Once logged in, they can create a new survey, view an existing survey, see their account, or go to settings.

- If they choose to create a new survey, they will be guided through the following questions
    - Name of survey
    - Which type (Anthropometric, Mortality, Custom)
    - Which language (as mentioned above, the survey needs to work in different languages on the collect application).
    - Which country
    - Which region
    - Which set (optional)
- Once they have answered those questions, they are led to the landing page, with the Planning pop up opened already

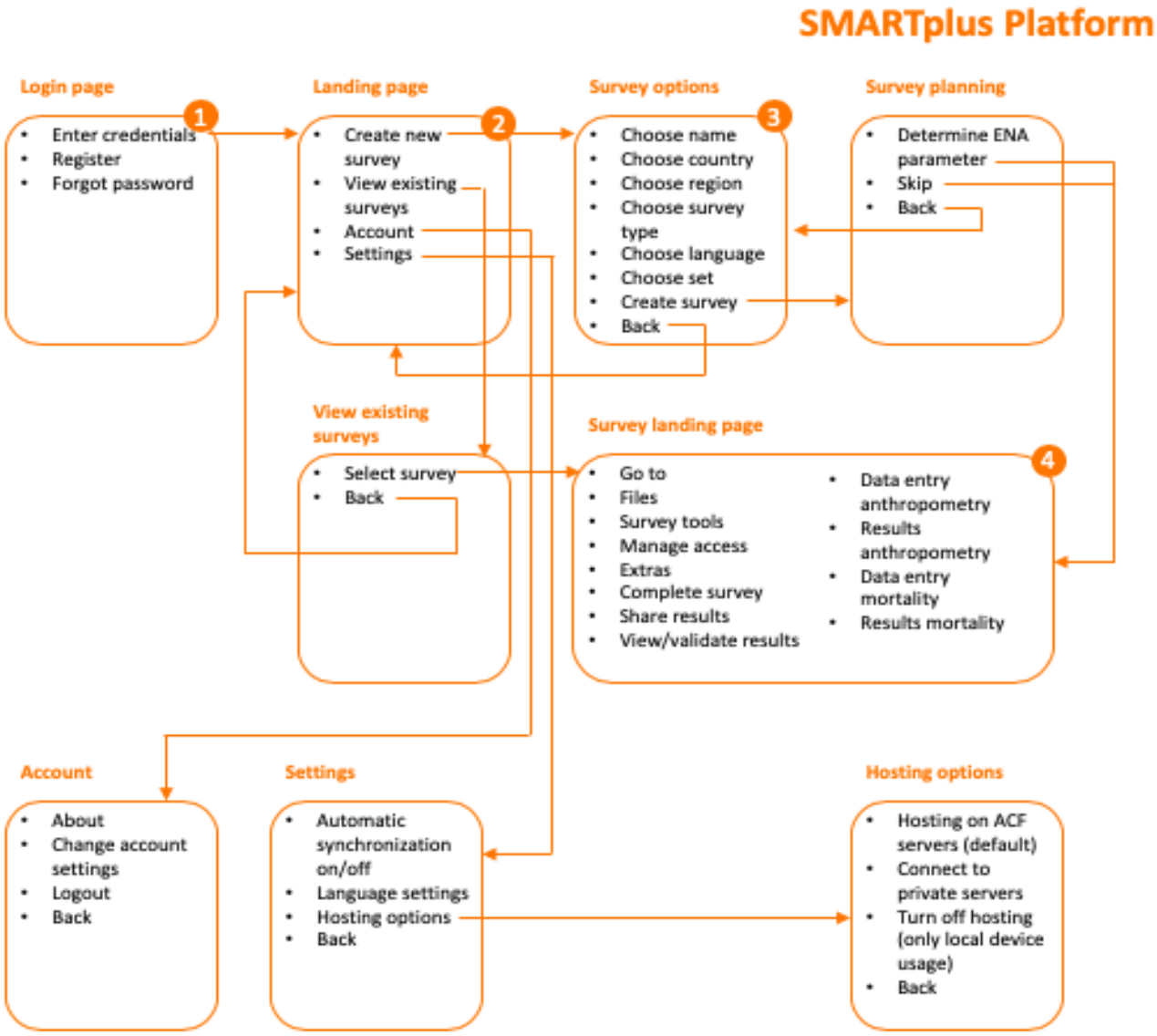

Figure 1. SMARTplus Platform Wireframe (a)

Survey landing page

The survey landing page is the core page of the Platform, its layout is like that of the ENA overview page. It has a range of riders at the top, described below.

- Go to
    - Create new survey: this option leads the user back to the survey creation process outlined above
    - View existing surveys: this option opens a pop-up with a list of existing surveys
    - Settings: this option takes the user to the application setting page, where they can modify general settings, such as automatic synching, or hosting options described above.
    - Standardization test: this option takes the user to the training mode
- Files
    - Replicated from ENA: this rider exists in ENA. All functionalities should be replicated by default, unless they are duplicated elsewhere on the Platforms interface. Any modifications to these settings should only be undertaken in close collaboration with the Action Against Hunger Canada project team
- Survey tools
    - Edit Form: this option takes the user to the ODK Build interface embedded on the Platform. Users can view the form that corresponds to the SMART survey type they chose (but they cannot modify it), an add additional indicators to the end of the survey. They can also save and use templates, and in future other indicators might be added by the SMART administrators as templates. It is important that any non-SMART indicators are visually marked, so that the Survey Manager is aware of which questions fall under the SMART methodology.
    - Planning screen: this option opens a pop-up screen with the options that are currently in the Planning section of ENA. Any changes to the survey planning fields can be saved, and the changes will automatically translate to the other parts of the Platform
    - Survey options: this option opens a pop-up screen with the options that are currently in the Options section of ENA. Any changes to the survey options field will automatically translate to the other parts of the Platform
    - Further survey settings: this option opens a pop-up screen with the remaining options of the survey, including name, location, type, set, how many random checks will be conducted, and others (a comprehensive list will need to be compiled with in the initial phase of the project).
- Manage access

- Manage Enumerator devices: this option opens a pop-up with a list of connected Enumerator devices. Existing devices can be removed, and they can be marked as lost/stolen, with the option of remotely wiping all data. New devices can be added, either by connecting a device via Bluetooth, or by generating a unique ID that can be typed in on the mobile device by the Enumerator (Enumerators request access, and the Survey Managers accept them). Survey Managers can also generate a random unique ID that Enumerators can use to reset their password.
- Manage distribution of households: this option allows the Survey Managers to modify the distribution of households to be surveyed by Enumerators. By default, the total number of households will be the same as that suggested by the ENA functionality, and the households will be distributed onto the Enumerators equally and according to their clusters (if applicable). The Survey Manager can manually change the overall number of households to be surveyed, as well as the distribution onto Enumerators.
- Add Survey Manager: this option allows the Survey Manager to add another profile to the survey and give them the right to edit the survey. By default, only the survey creator has those rights, but they can give others admin rights, too.

- Extras
  - Replicated from ENA: this rider exists in ENA. All functionalities should be replicated by default, unless they are duplicated elsewhere on the Platforms interface. Any modifications to these settings should only be undertaken in close collaboration with the Action Against Hunger Canada project team. One additional feature that is required is an option 'View results on map', where the Survey Manager can see all survey responses as pins on maps, with different colored pins by team, such that they are able to understand in which area the measurements were taken.

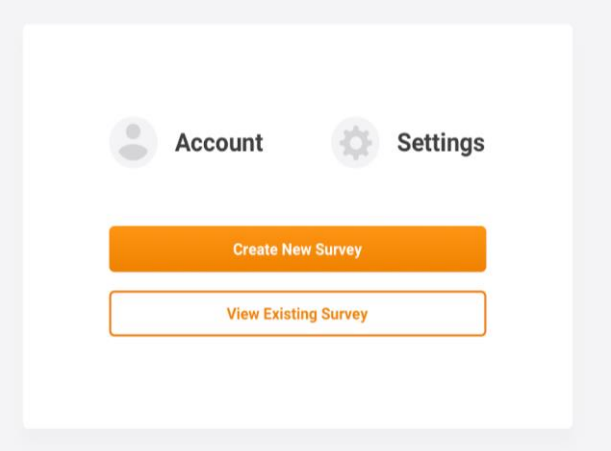

Figure 2. Survey Landing Page Mock-up

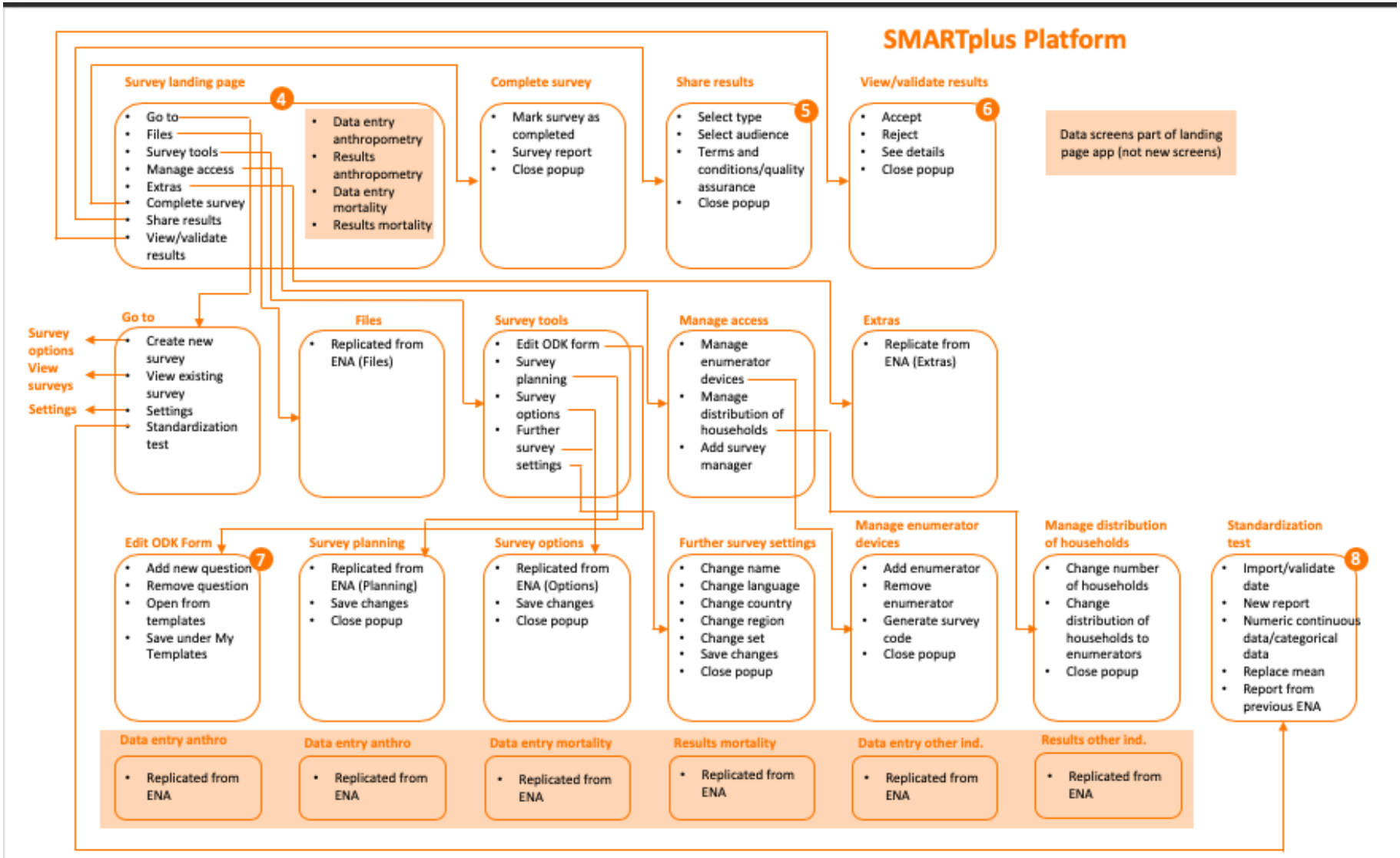

Figure 3. SMARTplus Platform Wireframe (b)

At the centre of the page itself is the table with data that is currently at the centre of ENA. As in ENA, users can switch between data entry and data results, both for mortality, anthropometric and other indicators. In each of the respective results sections, there is the option to click on 'Plausibility report' (replicating an ENA function). The plausibility report will be based on all data validated by the Survey Manager now the report is created. These fields should be replicated on the Platform with streamlined design. Any substantive changes should only be undertaken in close collaboration with the SMART team.

The page has three further buttons that do not currently exist on the ENA interface

- Complete survey: this button will mark the survey as completed. It unlocks the option of sharing the results with the Aggregator, and it will automatically close the survey on all Enumerators devices, triggering an automatic delete of data after a set period (e.g., 30 days).
- Share results: this button will open a pop-up screen that gives the Survey Manager a range of options for sharing the results with the Aggregator. Once they click 'Share', the results will be sent to the Aggregator for validation. The following options are available
    - Share raw data/summary results: this option allows the Survey Manager to share either the raw data, or the summary data (automatically extracted from the completed survey)
    - Share with: this option gives the Survey Manager the choice of sharing only with themselves, with specific groups or with the global community.
    - Data assurance: the Survey Manager must tick a box, confirming that the data was collected according to accepted standards, that they has reviewed the plausibility check, that they confirms that the data quality is appropriate, and that they acknowledges that the SMART staff will conduct random checks to ensure data quality.
- View/Validate results: this button works like an inbox, where results shared from Enumerators appear and must be validated by the Survey Manager. Responses will be added to the survey results once they are approved by the Survey Manager. Otherwise, they will be rejected (but not deleted). Each survey result comes with geolocation and timestamp, to allow the Survey Manager to know how long the survey took, and where it was taken. There is an underlying rule that tests whether the survey response was recorded in the cluster allocated to the Enumerator, or outside the cluster. Each survey results also comes with a line that specifies how many children under 5 were identified in the household, how many were measured, and what the comments were for each non-measured child.

The training screen can be reached from the survey landing page. It essentially replicates the features of the ENA training page (and the standardization test). One added feature is that the calculations that determine the score of an Enumerator are embedded in the table, and results are color coded according to the 4-scale measurement of ENA (Good, Acceptable, Poor, Reject).

On the Platform, users can import data and log it in manually (as previously) - additionally, they will have the option of adding devices (the same way as done on the survey management page) and receiving measurements from them, to populate the fields. The analysis functions remain the same as in ENA.

The survey form management screen is reached by clicking on 'Edit Form' under 'Survey Options' on the survey landing page. It leads the user to a page where they can partly modify the form of the survey, changing both the form that will be replicated on the mobile collect app, and the form that will be on the data field of the survey landing page.

The user interface is essentially identical to the ODK Build interface, which is well-established and familiar to users. Its visual design is streamlined, and a few modifications need to be made

- Depending on which type of survey was chosen, ODK Build uses the corresponding template and fills in the right-hand side. This section cannot be changed. Further indicators can be added to the end of the survey, but they are visually distinct (e.g. they are shown behind background of a different color), to indicate that they are not part of the SMART methodology.

Otherwise, users have the option of saving indicator lists as templates and using them in other surveys. It is likely that further lists of indicators will be added by SMART administrators to the ODK Build version within the Platform, to extend the benefits of standardization to other indicators in future.

SMARTCollect Mobile Application

The SMART+ collection application builds on ODK and retains the user interface of its survey form entry, while customizing the landing page for the purposes of SMART+.

- Login page: when users open the app, they land on the login page where they can:
    - Enter their credentials and log in: users will only be able to log in to one device. If they are logged in elsewhere, they will automatically be logged out the other device
    - Register (create an account):
    - Retrieve their password: if Enumerators have internet access, they can retrieve their password through a code sent to their email (or equivalent). If they do not have internet access, they can call the Survey Manager, who can generate a unique ID on the platform that will allow them to reset their password.
    - Go to settings: we recommend that users can access the automatic synching setting without having to log in, to make it easier to prevent unwanted data charges. Alternative solutions are acceptable.
- Landing page: logged in users get to the landing page. Enumerators should only be able to access one survey at a time, to prevent data entries into the wrong form. On their landing page, they will have the option to:

- Join a new survey: this will lead to them being removed from any other survey automatically. Users can join a new survey in the following ways
  - Join by Bluetooth pairing: they need to connect their device with the mobile collection application of the Survey Manager to request access to the survey
  - Join by code entry: they can join a survey by typing in a unique ID generated by the Survey Manager
  - Back: return to previous menu
- Continue existing survey: the Enumerator is led to the form for their current survey. By default, they will be sent to where they ended last time. If they previously started a survey but did not complete it, they will be asked whether they would like to continue with the current form, or begin a new one
- Training mode: users can join a training without being removed from their current survey. They have the following options
  - Join by Bluetooth pairing: they need to connect their device with the mobile collection application of the Survey Manager to request access to the survey
  - Join by code entry: they can join a training by typing in a unique ID generated by the Survey Manager
  - Back: return to previous menu
- Settings

Once Enumerators have joined a survey, they can begin filling in a form. The form itself replicates the form that the Survey Manager created on the Platform. The form begins with the consent form, to be either signed electronically, or on paper, with a screenshot or scan to be added to the form. The form also dynamically adapts to responses given throughout the survey. First, depending on the number of children under the age of 5 entered in the household section, there will be corresponding fields for each child later in the survey, prompting the Enumerator to take measurements for each child under 5. If no measurement is taken, the Enumerator must explain why in a comment section. Second, rules for implausible data entries based on ENA calculations are embedded in the mobile collection application. An implausible data entry immediately prompts re-entry. The Enumerator will not know whether this was prompted by an implausible entry, or by the random re-entry prompt built into the survey.

For each survey question, Enumerators have the option of entering a response, going to the previous question, or ending the survey. If they end the survey, they can save their progress. By default, all entries up to the current question will be saved, but not whatever has been entered the current field. Once the last question has been reached, they can click on ‘End survey’. They will be shown a pop-up asking them to confirm that the data collected conforms to SMART standards. If they accept, they will not be able to change the survey results later, and the results will be shared with the Platform manager through one of the different ways specified.

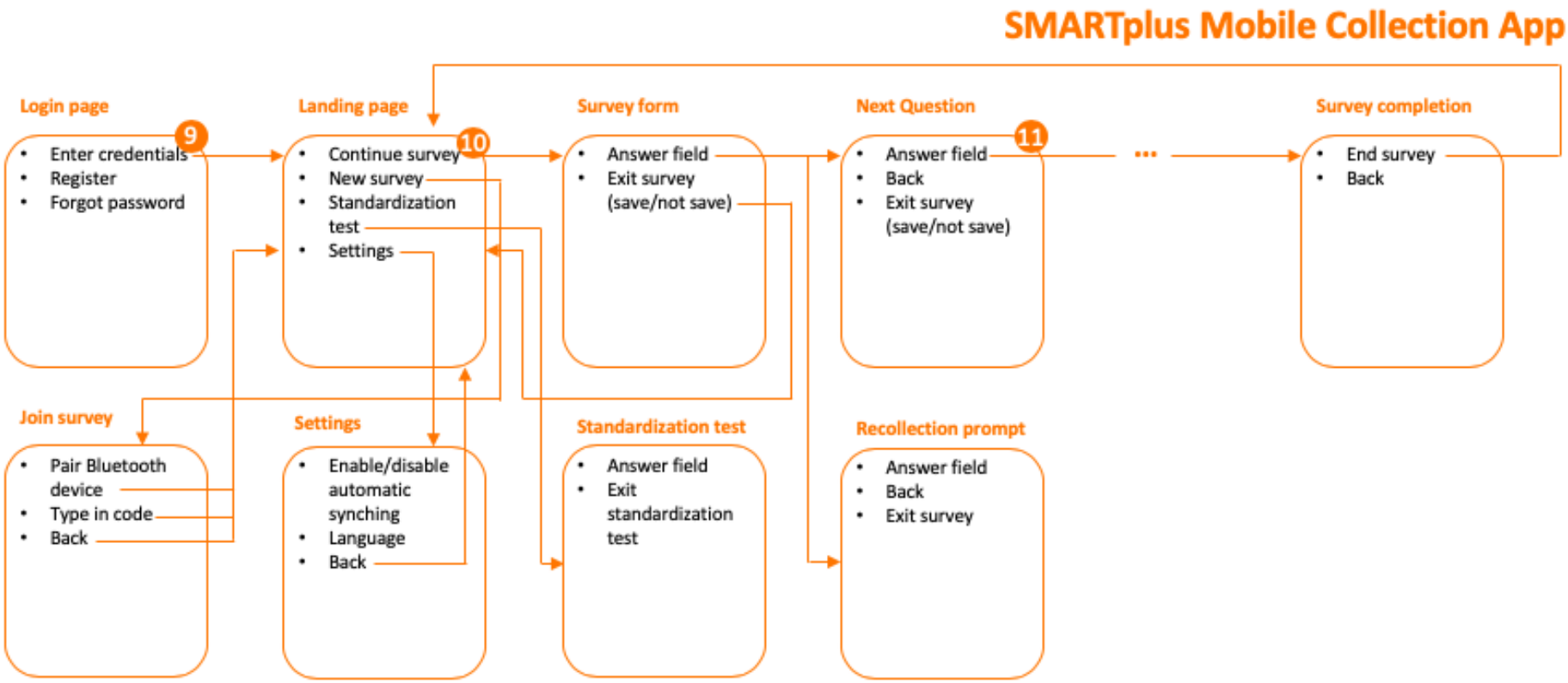

Figure 4 SMARTCollect Mobile Application Wireframe

User Profiles

Survey Manager

Survey Managers create surveys in the system, train Enumerators, manage data collection and share data with various stakeholders. Survey Managers may be NGO workers, data collection specialists, or government workers. Each group may have different needs for the survey – government workers, for example, may need to run the same survey at a large scale twice a year, while an NGO may only run it once in an emergency-affected area. SMART+ will be designed to offer flexibility for all these workers. They are the most important stakeholder for SMART data, as they operate at the intersection of the methodology and the data collection. As Enumerators work for them and will tend to use whatever software is mandated by the Survey Manager, they are the most important actor in the ecosystem.

Often, Survey Managers will have multiple stakeholders to satisfy. This is particularly relevant when thinking about SMART+ because the system needs to give them the flexibility to use surveys in their own way. They need to be able to add questions to the end of surveys, as they often cannot afford to send Enumerators out several times.

Survey Managers create surveys in the system, providing the quantitative input of the different entry fields that will automatically calculate sample sizes and clusters. While they are often trained in the SMART methodology, not all of them will be fully proficient in the statistical techniques required to conduct surveys (hence why they need support from SMART+). It is thus key that the user interface of SMART+ (based on ENA) be understandable and usable without extensive statistical knowledge. Similarly, Survey Managers are not necessarily experts in data privacy and security. Thus, SMART+ needs to ensure the choice architecture and user interface helps Survey Managers make the right decisions with respect to data privacy (e.g. by double-checking whether private information has been shared).

Usually, Survey Managers are expected to deliver the results of the survey within 2 weeks of completing it (the rapid turnover enabled by SMART's standardized and automated statistical analysis is one of the core benefits of SMART). Survey Managers will often operate in the field (e.g., supervising Enumerators). This means that they must be able to access the SMART+ functionalities in areas where there is no internet access, or low-bandwidth connections.

Enumerator

Data Enumerators are hired (often short-term) by Survey Managers, or the organizations they represent, to collect data by conducting surveys. Conducting a survey takes around 15 days, of which 5 are for training and planning, and 10 for data collection. Rapid surveys in emergency situations might be conducted in 7 days, including training, while national surveys might take longer.

Surveys are conducted in teams of three, led by a team leader, who is more experienced and has usually conducted surveys already (SMART or other). The team leader manages communicates

with the household and fills in the data. He is helped by two measurers; measurer and assistant measurer (where the former is more experienced and/or has performed better during the training).

Enumerators are mostly young and local, as they need to speak the local language to perform surveys. Their job can be physically taxing, with travel to remote places, and long hours that include debriefs late in the evening. As they need to perform height measurements, they are mostly able-bodied. Their educational background varies - while Enumerators are often students, they are sometimes without formal education. For the data collection at hand, they will receive a standardized training unit (2-3 days of intense training).

The Enumerator profile implies several things: first, any software for data collection must be extremely easy to use, to allow Enumerators with different levels of experience to use it without errors. Second, as Enumerators are mostly young, a mobile solution is preferable (interviews suggest that most Enumerators use their own smartphones for data collection and frequently work with ODK). Third, the key concern is the quality of the data collected. As Enumerators often work on just one survey, they do not receive extensive training. This implies that the data collection process needs to be designed specifically to reduce possible confusion and data entry errors. Fourth, they mostly operate in the field, so it is essential that any solution works offline as well as online. Fifth, there is no need for the Enumerators to have access to the planning and analysis elements of the survey, this is for the Survey Manager.

Aggregator Users

The users of the Aggregator are any organizations (or individuals within those) that have been granted access rights by SMART staff. They would typically be nonprofits, governmental departments, donors, researchers, organizations that declare and predict famines, and other actors in the space. Many users of the Aggregators would be contributors of data, too. National level data will be accessible to restricted users (i.e. chair of assessment working group of that country - meaning that it is either a representative of ministry of health or cluster coordinator).

The main purpose for which people use the Aggregator is to draw on SMART data to derive insights for their organization’s purpose. A government agency might be interested in evaluating regional data on nutrition to decide where to allocate budget resources. A nonprofit might be interested in pulling data to communicate the need for action to their donors.

The following are common interests shared by many users of the Aggregator: first, the data needs to be secure and anonymized. Many organizations need to be certain that the data they have collected and shared is only being seen and accessed by those groups or individuals who they shared it with explicitly. Second, the data needs to be readable and understandable. The database needs to be searchable and usable by a new user. Third, the database needs to fulfil some specific functional requirements to meet user needs. This includes the ability to export data in common formats, and the ability to create basic visualizations of the data.

Dashboard Users

Dashboard users range from experts in the field to complete outsiders (i.e. an uninformed interested consumer), and the dashboard should accommodate both groups. For both of those user groups, the dashboard needs to be a highly intuitive and visually appealing summary of the global findings of SMART. They should be able to perform some manipulation of the visuals, in order to view regional differences or trends over time, but the level of detail and complexity should not be overwhelming. Some users might want to save screenshots or export images of the data, so visualizations should always be understandable without further context or expertise (e.g., through clear labelling).

In order to satisfy a more sophisticated user group, there should be an option to download summary data in common formats. If users want to use summary data for their own planning or for presentations, they should not have to copy manually from the screen. Last, there should be relevant links where interested readers can obtain more information.

Itemized List of SMART+ Software Requirements

The following is an itemized list of requirements for the SMART+ software suite. It is a complement to the requirements outlined elsewhere in this document. This list is intended as a guide to facilitate checking compliance with the specifications. It may not be exhaustive.

1. General Requirements

1.1. All software in the SMART+ suite is highly secure.

1.1.1. Survey respondents' information is not at risk of discovery by unauthorized or malicious use of the SMART+ suite.

1.1.2. Users' information is not at risk of discovery by unauthorized or malicious use of the SMART+ suite.

1.2. SMART+ software can be used offline, online, and with poor quality internet connections.

1.2.1. The Platform's mobile and desktop applications, as well as the SMARTCollect mobile application can be used offline as well as online.

1.2.2. The Platform's mobile and desktop applications, as well as the SMARTCollect mobile application can connect and perform synchronization functions via Bluetooth.

1.3. The SMART+ suite of tools is user-friendly and available in multiple languages.

1.3.1. The Platform runs on all commonly used[5] versions of Windows and Macintosh desktop/laptop distributions and all commonly used versions of Android and Apple mobile devices.

1.3.2. The SMARTCollect application works on all commonly used versions of Android and Apple mobile platforms.

1.3.3. The SMART+ global Dashboard and web application perform reliably in commonly used versions of Mozilla Firefox, Google Chrome, Safari, Microsoft Edge, and Microsoft Internet Explorer.

1.3.4. The SMART+ suite of tools performs consistently across devices with varied memory, processing power, and energy efficiency specifications.

1.3.5. The SMART+ suite of tools performs automatic updates without negatively impacting the user experience.

1.3.6. The SMART+ suite of tools is revised and improved based on user feedback.

1.4. The SMART+ Platform and SMARTCollect mobile application have well-documented APIs to allow integration with external applications.

1.5. The SMART+ suite of applications can be downloaded freely, easily installed, and automatically updated.

[5] Appropriate systems and versions should be determined by user needs/feedback, Action Against Hunger Canada staff guidance, and expert advice. A general guideline is to support all platforms currently supported by OpenDataKit.

2. SMART+ Platform Requirements

2.1. The Platform replicates all the survey creation functionality of the Emergency Nutrition Assessment software (ENA) and OpenDataKit (ODK).
2.2. The Platform is available in web version, mobile version and desktop version.
2.3. The Platform has survey planning functionality.
2.4. The Platform has survey administration functionality.
2.5. The Platform has survey data collection and storage functionality.
2.6. The Platform has a means to prevent synchronization conflicts between users working on the same survey.
2.7. The Platform replicates all the survey data analysis functionality of the latest version of the Emergency Nutrition Assessment software (ENA) with some few additional analyses.
2.8. The Platform has to allow integration of historical data (previously shared by ENA users in AS file format).
2.9. The Platform has survey result dissemination (sharing) functionality.
2.10. The SMART+ Platform is secure.
2.10.1. SMART+ Platform logins require a username and password.
2.10.2. SMART+ Platform passwords are stored on servers with 256-bit, equivalent, or superior encryption.
2.10.3. All data on devices running the SMART+ Platform is encrypted.
2.10.4. All SMART+ data is encrypted when in transit.
2.10.5. All SMART+ data is synchronized only when a secure connection is established.
2.10.6. All API requests are authenticated with OAuth2.0 or equivalent.
2.10.7. Two-factor authentication is implemented where appropriate.
2.10.8. SMART+ Platform data is hosted on a Virtual Private Network or equivalent solution.
2.10.9. The SMART+ Platform data can be hosted in several different ways.
2.10.9.1. The SMART+ Platform data are, by default, hosted on Action Against Hunger Canada servers.
2.10.9.2. The SMART+ Platform data can be hosted locally.
2.10.9.3. The SMART+ Platform data can be hosted on a custom server.
2.10.9.3.1. Custom server setup is well documented with example scripts and instructions as necessary to enable easy custom server configuration with the SMART+ Platform.
2.10.9.4. The SMART+ Platform data are automatically synchronized across devices, subject to the hosting and permissions policies selected by the Survey Manager.
2.10.10. SMART+ Platform data is available only through an API with proper authorization.
2.11. SMART+ Platform data is backed up daily.
2.12. The SMART+ Platform, where necessary, is compliant with HIPAA and GDPR.
2.13. The SMART+ Platform application automatically clears any saved or cached files on a device after a set time period has passed.
2.14. The SMART+ Platform desktop version has a manual data entry functionality to transcribe paper-based surveys.
2.15. All elements of the SMART+ Platform automatically synchronize with the web version, subject to the hosting and permissions policies selected by the Survey Manager.
2.16. Automatic synchronization can be turned off.

2.17. The SMART+ Platform has a standardization test functionality for training Enumerators, including the relevant calculations and functions as implemented in ENA.
2.18. Survey Managers can create surveys in the SMART+ Platform applications.

3. SMARTCollect Mobile Application Requirements

3.1. The SMARTCollect application can be used by Enumerators with minimal technical expertise.
3.2. SMARTCollect Enumerator users cannot change the structure of surveys.
3.3. The SMARTCollect application functions in the settings in which SMART methodologies are applied.
3.3.1. The SMARTCollect application works offline and online.
3.3.2. The SMARTCollect application is capable of automatically and opportunistically synchronizing (i.e., when there is a secure connection available).
3.3.3. The SMARTCollect application can function, including synchronizing data, on low-bandwidth and poor-quality networks.
3.3.4. The SMARTCollect application is internationalized and can easily be extended to support additional languages, including non-Latin writing systems (e.g., Arabic, Hindi).
3.4. The SMARTCollect application can be freely downloaded and installed.
3.5. Enumerators must be added to surveys on the SMARTCollect application in order to access its contents and collect responses.
3.5.1. Enumerators can be added by Bluetooth/cable connection.
3.5.2. Enumerators can be added by entering a unique code generated by the Survey Manager.
3.6. Enumerators, once added to a survey, can see how many responses are still to be collected.
3.7. The SMARTCollect application closely resembles the ODK interface.
3.8. The SMARTCollect application us built on top of ODK.
3.9. The SMARTCollect application uses ODK's XForms specification to store data.
3.10. The SMARTCollect application uses the ODK JavaRosa library, or equivalent to visualize data.
3.11. The SMARTCollect application stores data in the same directory structure as ODK.
3.12. The SMARTCollect application starts each survey with a process to obtain respondents' consent.
3.13. The SMARTCollect application includes all necessary questions to satisfy the SMART methodology.
3.14. The SMARTCollect application contains an API connection to the digital body measurement app that is being built in parallel.
3.15. The SMARTCollect application dynamically adds fields as necessary in order to enumerate all members of the targeted population. For example, if a household has 3 children under 5 years of age, the application will ask for three MUAC measurements. These measurements will be associated to each child.
3.16. Enumerators are prompted to re-take implausible measurements, as determined by ENA algorithms.
3.17. Enumerators can also be prompted to randomly re-take measurements as part of the survey design.

3.18. Individual surveys are shared with the platform once they are finished via automatic synching, subject to synchronization restrictions imposed by the user.
3.19. The SMARTCollect application exposes a well-documented, standards-compliant API which allows for integration of new malnutrition measurement tools (e.g., SAMphoto) into the application and survey.
3.20. Survey data is stored locally in 256-bit encrypted form, equivalent, or superior industry standard.
3.21. Survey data is transferred (synched) only when a secure connection has been established.
3.22. Survey data stored on the device can be deleted in a variety of ways and situations.
3.22.1. When surveys are closed by the Survey Manager, survey data (responses, survey structure, and metadata) is wiped from the device.
3.22.2. The Survey Manager can also remotely initiate a data wipe, to address cases of loss or theft.
3.22.3. Data on the device is wiped after a preset period (e.g., 30 days) if there has not been any activity (e.g., surveys completed, logins).
3.23. Enumerators cannot log into more than one device at a time.
3.24. The SMARTCollect application does not contain any personal or household-identifiable data.
3.24.1. Any personal or household-identifiable data is suitably anonymized by the SMARTCollect application.
3.24.2. The SMARTCollect application proactively identifies and corrects potential violations of confidentiality and privacy.
3.25. Data alteration by the Enumerator is only possible before a survey is marked complete.
3.26. Data alteration by the Enumerator is tracked and a record of any changes is provided to the Survey Manager, to promote data quality and reduce fraud.
3.27. Surveys can be set to “Training Mode” by Survey Managers, which replicates the functionality currently available in ENA.
3.28. The SMARTCollect application has the geolocation and timestamping functionalities of ODK Collect. Geolocation can be turned off depending on the security situation in-country.
3.29. The SMARTCollect application can handle the anticipated volume of users and data collection teams.
3.30. The SMARTCollect application automatically identifies Enumerators by their device.
3.31. If a cluster survey is selected, a cluster variable will be displayed in the SMARTCollect application interface.

4. SMART+ Global Data Aggregator Requirements

4.1. The Aggregator is hosted on a cloud computing service.
4.2. The Aggregator is hosted on the same server as Platform data but does not have access to data which has not been shared by users.
4.3. The Aggregator has the same analytic tools as the Platform and ENA.
4.4. The Aggregator has some additional analytic tools, including the ability to filter by location, time, and other survey metadata.

4.5. The Aggregator is administered by 5 users who manage access and validate data submitted to the Aggregator.
4.6. Aggregator users only have access to data which they have permission to view.
4.7. Aggregator administrators can remove data from the Aggregator.
4.8. Users can only store data on the Aggregator if they share summary statistics from their own surveys.
4.9. The Aggregator has an interface like a table, as well as other visuals to communicate key trends.
4.10. The Aggregator shows all core SMART data by default but can also show additional indicators outside of the default view.
4.11. The Aggregator has export functionality for common data formats (e.g., delimited value, plain text, spreadsheet, JSON, GeoJSON).
4.12. Users who have been granted permission can access data through a standards-compliant web API, which returns a JSON or delimited-text response.
4.13. The web API is well documented with example code.
4.14. The Aggregator's cloud host is secure and adequately protects users' data.
4.15. The Aggregator's cloud host is scalable to accommodate increased use in emergencies.
4.16. The Aggregator's cloud host stores data in a single jurisdiction (e.g., Canada).
4.17. The Aggregator uses Secure Sockets Layer (SSL) for all webpages.
4.18. The Aggregator and its database can handle multiple concurrent requests/reads.
4.19. The Aggregator's database is backed up daily.
4.20. The Aggregator is, or can easily be made, eligible for data certification (e.g., DRAMBORA).
4.21. The Aggregator is capable of handling data of the expected size, while scaling to larger datasets as necessary.

5. SMART+ Dashboard Requirements

5.1. The SMART+ Dashboard can be accessed from the Global Nutrition Cluster website.
5.2. The Dashboard is automatically synchronized from the data in the Aggregator, subject to all relevant permissions and restrictions.
5.3. The Dashboard visuals are appealing and accessible to technical and non-technical users alike.
5.4. Dashboard users can manipulate variables to create customized views of the visualizations.
5.5. Dashboard users can export their custom views to common formats (e.g., PDF, TIFF, PNG, SVG, HTML).
5.6. The Dashboard design and content are based on instructions from the Global Nutrition Cluster and Action Against Hunger Canada.
5.7. The Dashboard design is extensible, and additional indicators can easily be added in the future.