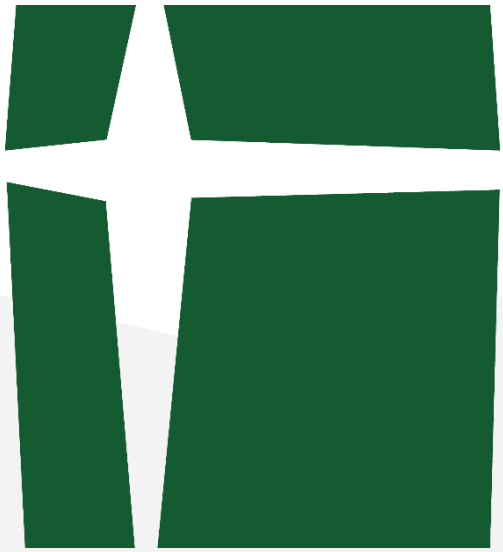
INCEPTION REPORT

Web Based Quality Assurance/Quality Improvement Activities

For
Nepal CRS Company

Tokha, Kathmandu



Submitted to:

Nepal CRS Company
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Abbreviations

API	Application Programming Interface
QA/QI	Quality Assurance/ Quality Improvement activities
FAQs	Frequently Asked Questions
HTTP	HyperText Transfer Protocol
ICT	Information and Communication Technology
iOS	Operating System from Apple Inc.
QA/QC	Quality Assurance/Quality Control
SDD	System Design Document
SMS	Short Messaging Services
SoP	Standard Operating Procedure
SRS	System Requirement Specification
SSL	Secure Socket Layer
UI/UX	User Interface/User Experience
HF	Health Facility

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1. Introduction

This inception report has been prepared to provide common understanding on the scope of work (SoW) regarding the development of web based Quality Assurance, Quality Improvement - QA/QI Software between Client, Nepal CRS Company and Vendor, Pathway Technologies & Services P. Ltd. The document describes scope of work of the project in detail based on our current understanding of the proposed system. If there is a clarity in the features and functionalities of the system before its development, the time period for the development of software will be more efficient and there will be less issues or bugs in the system at a later phase. Thus, we hope that we can clarify the features and functions of the QA/QI through this document as much as possible. Your feedback is also very important to make sure that development of the system goes in the right direction.

1.1. Background

Nepal CRS Company is one of the oldest and most successful locally managed social marketing organizations. CRS has established itself as a pioneer in health communications and marketing, playing a key role in developing markets for condoms, oral contraceptive pills, and oral rehydration salts. CRS has helped increase the role of the private health sector in Nepal, particularly the use of pharmacies as a source of products and services.

CRS has grown steadily since its inception and contributes significantly to Nepal's national family planning and public health outcomes. According to NDHS 2016, 25% of women using Injectables, 58% of women using oral contraceptives pills, and 45% of women using condoms use CRS products.

USAID Adolescent Reproductive Health (ARH) is a five-year program supported by the U.S. Agency for International Development (USAID) led by CARE Nepal and in partnership with the Association of Youth Organizations Nepal (AYON), Howard Delafield International (HDI), Jhpiego, and Nepal CRS Company (Nepal CRS). USAID ARH is an adolescent co-led initiative to empower girls and boys, 10-19 years, including the most marginalized, to attain their ARH rights. The primary goal of USAID ARH is to support adolescents to reach their full potential and strengthen public systems and private entities to create an enabling environment for healthy ARH behaviors. Adolescence is a complex developmental stage where physical, psychological, and social changes are occurring which lay the foundation for the transition from childhood to adulthood. USAID ARH aims to contribute to a healthy, resilient, well-nourished population in Nepal.

Web-Based System for Quality Assurance / Quality Improvement (QA/QI) is a quality assurance and quality improvement system. It will be designed to use by the USAID ARH program to support the integration of the ARH quality standard across the 275 private health facilities for high-quality FP/RH services for adolescents, including increased access to quality family planning services, development of the quality assurance system, strengthen the Quality of Care by standardizing and establishing the quality improvement system in the private health facility to

deliver high-quality FP services. The QA/QI web-based system captures information on quality service delivery of private health facilities, the action plan of each facility, and client satisfaction. The web-based system also captures the Family Planning (FP) compliance adherence data and service data recording sheet per HMIS 3.2, 3.3, and 3.4 and private health facility reporting form 9.5. The pharmacy supported by USAID ARH will report service and report data in this system. The goal of using a QA/QI web-based system is to implement the plan-do-study-act QI (Quality Improvement) model, strengthen service data and reporting, and linking client feedback through the QR code system to urge service providers to address access and quality gaps related to family planning using the provider behavior change communication (PBCC) activity.

1.2. Objective

The overall objective of the assignment is to design, develop and customize web based software QA/QI hereafter referred to QA/QI for stakeholders ranging from M&E and program team of NEPAL CRS COMPANY, Donors, ARH program users and designated users from consortium organisations of ARH. After the successful operationalization of this system, it will strengthen the institutional capacity NEPAL CRS COMPANY for the effective implementation of ARHY program. The software will serve the needs of data collection and information dissemination but will also make sure there is room for new feature additions in the future if need be.

The main technical objective of this assignment is to develop QA/QI system, and training NEPAL CRS COMPANY team and provide initial level technical & implementation support for the operationalization of the system. To be specific, following are the objective of this assignment:

- Develop QA/QI (web application) and a supporting Android based data collection APP that will provide all the features described in the “Features and Functionalities” section of this document.
- Deploy QA/QI system in both test server and live/production server of NEPAL CRS COMPANY. So that, NEPAL CRS COMPANY team can actively use, test the system and provide feedback.
- Help NEPAL CRS COMPANY team to populate some initial data in the system and Field-Test the software suite
- Provide training to NEPAL CRS COMPANY team to use the system
- Provide technical support to as necessary for the operationalization of the system

1.3. Scope of Work (SoW)

QA/QI

The overall scope is to develop a web-based software to manage the flow of work from data collection, recording, data entry, revision and consolidation is performed from the ground through and with the support from NEPAL CRS COMPANY. The software should be able to cater needs of documentation, data collection, recording, data entry and reporting in a user-

friendly software for data recording, storing, and reporting. The database system should be updated from all identified stakeholders who will log-in as software users and can directly report their own information. This mechanism will ensure on-time and quality data reporting to different stakeholders.

The Scope of Work was envisaged to be achieved in 4 Sub-Tasks. Reason being, categorically break down the complexities in discovery, approach and implementation for the processes involved. Post kick-off, we have already begun working with NEPAL CRS COMPANY team on these items.
One of the major objectives of this Inception Report is also to re-visit the SoW with reference from the ToR document and outline the status of each deliverables.

These are listed below with **status**:

1.3.1 Work Plan

Submission of the detailed work plan for the setting up of the QA/QI (By detailed Gantt chart showing milestones/major deliverable and activities	Done -Included in this doc
Project implementation methodology	Done -Included in this doc

1.3.2 Gap Analysis and Program Requirement Document

A thorough assessment of any existing MIS or manual system that NEPAL CRS COMPANY is using currently	Done -Included in this doc
Submission of detailed list of requirements for creating this software	Done -Included in this doc
Evaluate and recommend the latest technology (.NET) and standard of adopt for IT to ensure reliability, upgradability, scalability, and sustainability of the system	Done -Included in this doc

1.3.3 Software Coding, Roll-out and Implementation

Design	
Design Web based project management information and database management system application	Not Started
Design and Develop user-friendly and scalable Android App	Not Started
Data Management	
Batch import key existing data as identified	Not Started

Main Features of Web-Based Software	
Dashboard: Summary of Database with highlighted indicators, User-wise attention required workflow summary	Not Started
User Management: • Role based Access Policies • Settings based Data Access • Role based workflow check-points with submit, verify and approve mechanisms	Not Started
Data Coding: Import Data in Batch based on availability from NEPAL CRS COMPANY (where applicable): • Project areas Based on the coding system of GoN including Geographical boundaries (Province, District, Municipalities and Wards) • Ethnicity Names and Codes • Age Group Settings • 275 Private Health Facilities (and Pharmacies) Names, Codes, Geography etc.	Not Started
Workflow • **QA/QI Checklist**- Data Recording as per the questionnaire/ template provided by Nepal CRS for FP/RH Services provided for Adolescents with CREATE - APPROVE mechanism. New Action Plans based on gaps identified during Visits can be generated by the user for the HFs encapsulating what action items need to be addressed. The Action plans are then followed up during next visit and marked as 'Done', 'Pending' or 'Not started' • **Client Feedback** – System should be able to generate a unique QR code for individual HF which will be printed and displayed on the HF premises. Through QR code system, clients of the HF can scan the QR code and they will be presented with an online form from where they can provide a formatted questionnaire taking inputs from the client. • **Service Record** – System should provide HF representative to input necessary fields for HMIS reporting	Not Started
Deployment and Security	
Deploy the web and mobile app on QA/UAT level for Field level testing purposes	Not Started
Deploy the web and mobile app on PRODUCTION server for Real World usage	Not Started
QA/QI should be effectively secured to prevent possible fraudulent access and software attack	Not Started
Backup system need to be installed	Not Started
Data storage services as applicable.	Not Started

2.4 Operation Manual and Training of Tutors

• Pathway will deploy the executable software files in the live server • With directions from CRS Nepal technical team, Pathway will deploy Android app to Google Play Store • Handover the software to NEPAL CRS COMPANY with Final Project Report • Provide troubleshooting support • Submission of comprehensive operation and user management manual • Capacity training as a Training of Tutors (inside Kathmandu valley) (ToT list to be provided by NEPAL CRS COMPANY)	In Progress

2. Features and Functionalities of QA/QI

The proposed system will be designed, developed and implemented with capability of collecting QA/QI checklist, client feedback and service record data. The diagram above depicts the standard working methodology of QA/QI encapsulating both the major workflow and associated target user groups.
We have revised the workflow based on feedback collected from NEPAL CRS COMPANY technical focal point during our kick-off meetings.

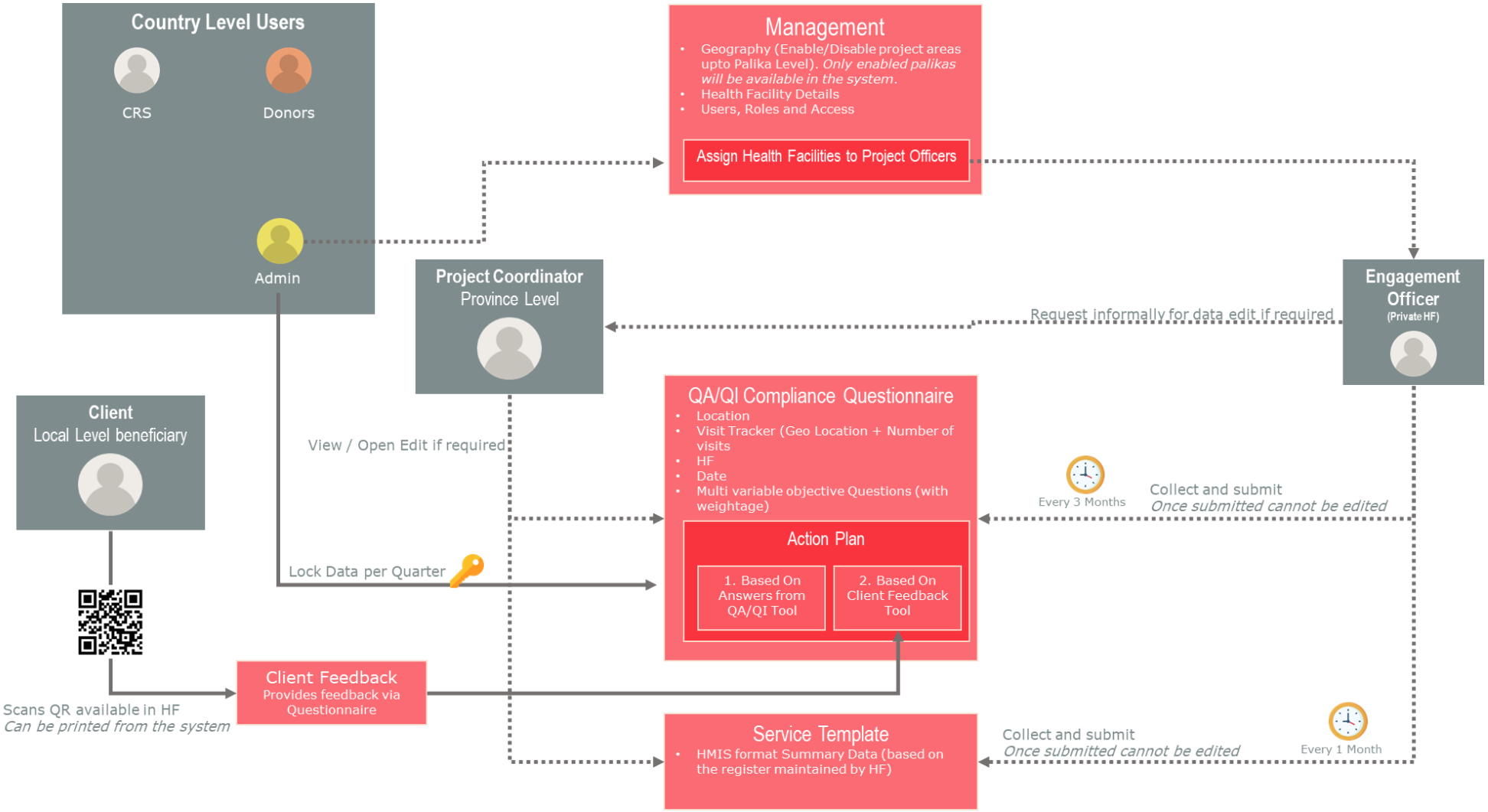

Figure: General Overview of QA/QI Process Workflow

3. Dashboard Mockup

The following diagram presents a mockup design of QA/QI Dashboard. Indicators and data display will vary as we keep on working on the actual data formats during project implementation.

Figure: General Overview of QA/QI Dashboard

4. System Users/Actors

Based on our interaction with NEPAL CRS COMPANY, we have identified following users of the system and their respective roles for the smooth operationalization of the QA/QI:

1. System Super Admin – Has access to ALL components with full privilege
2. NEPAL CRS COMPANY (Administrator role) – Has access to ALL components with full privilege along with operational forms and reporting components
3. Province Users/Project Coordinators– Has access to ALL components with full privilege and Province Level Data approval mechanisms
4. Project Officers/Engagement Officers – Has access to mobile data collection tool and assigned HFs as designated by Nepal CRS
5. Report Viewers – Dashboard and Analytics sections

Additionally, **System Super Admin** user performs the following tasks in the system for the system setup and configuration:

- Setup Users:
    - Data Format: Name, Email, Phone No., Address, User Type
- Monitor and Update/Manage List of all HFs (as required)
- Monitor and Update/Manage Meta-Data like Ethnicity, Geographical Region code, other Master Settings which will be presented in the web application as a 'Choose From' options
- Ultimate/Final Access to ALL collected Data sets including

5. Proposed System Architecture

The system will be designed under open source platforms. No proprietary software would be required on the user side and the web interface would be interactive and user-friendly.

Following diagram shows the overall system architecture of the system and technological stacks that will be used in the system. The entire system will be hosted in Windows Server. Basically, QA/QI will consist of a DBMS/database server and a Web server. Database server takes care of data storage and data management, Web server is responsible for providing www service. Users can have access to the system with the compatible browser with different web applications tools; visualize summary data, query data and visualize data in tabular or graphical forms. The system can be browsed in standard web server/browser.

From a technological point of view, **PostgreSQL** will be used as a Database Management System to store all the data captured and managed from the system. PostgreSQL will be important if we have to manage and manipulate complex Geospatial data. For application server IIS web server will be implemented to host the QA/QI which will be developed using ASP.NET framework. Web client will be based on MVC Razor views in tandem with Angular 14. All clients' web applications will be consuming restful API from ASP.NET Web API REST framework.

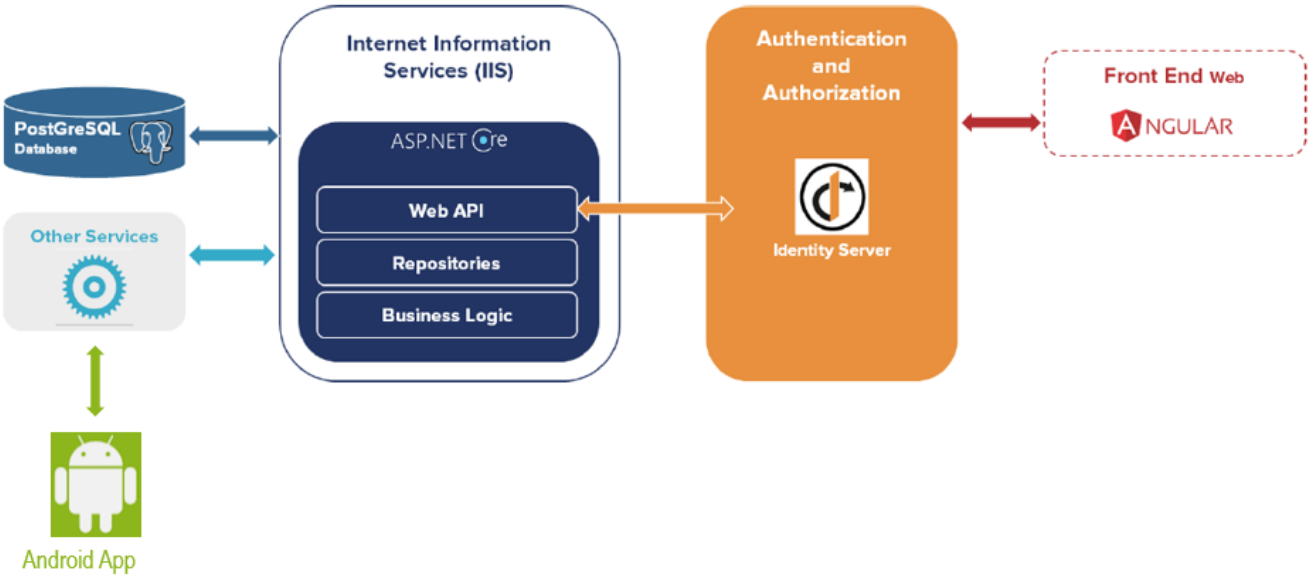

Figure: Proposed technical architecture of QA/QI

6. Required Documentations from NEPAL CRS COMPANY

Document Name	Received by Pathway
Government Formatted Coding	Province – In Progress District – In Progress Palika – In Progress Ward- In Progress
Health Facility Names and details	Not started
Other Coding systems	Not started
Student Application PMT format	Done
Revised PMT Scoring/Ranking Rule Format	Done
Student Bond Form format	Done

7. Methodology

a. Feasibility Study, Strategic Meetings and Need Assessment

Strategic meetings and feasibility assessments were conducted with appointed technical personnel within NEPAL CRS COMPANY. We will continue to do so to lock down the detailed requirements. The assessment will identify the needs of potential target groups to develop effective intervention strategies that contribute to link between stakeholders and the requirements.

Besides, focus group discussions (FGDs) with NEPAL CRS COMPANY members should be continuously done so as to avoid any deviations on the requirements on the software.

Furthermore, feedback on this Inception Report will be gathered from concerned stakeholders to finalize the document.

*Output of this phase will be**: Inception Report***

b. Co-designing and Prototype Development

In this phase, a few rounds of meetings/workshops will be conducted in close collaboration and consultation with the project team from NEPAL CRS COMPANY. The objective of such a co-designing workshop is to

come up with more ideas on the processes, standard operating procedures, workflows, incentive mechanism to update daily data, wire framing, and prototyping will be discussed and finalized.

c. Development of QA/QI

After finalization of the requirements, development of QA/QI can be started. Standard software engineering practices will be followed to develop the system which basically consists of following steps:

i. System Development

So far, for the Analysis, Design, and Prototyping of the APIS, the water-fall model will be followed. However, while developing the system, Agile Scrum methodology will be followed. From SRS and SDD, product feature backlogs can be created and based on priority set for the listed features, and accordingly sprint backlog will be created for the development team. The system development will be carried as presented in Figure III. Depending on features, the sprint can be of 2 to 4 weeks. At the end of every sprint, features will be demonstrated to the client for feedback and finalization as far as possible. In every sprint, a set of features will be discussed, designed, developed, and tested thoroughly. Multiple modules will be developed in parallel as far as possible in order to meet the deadline.

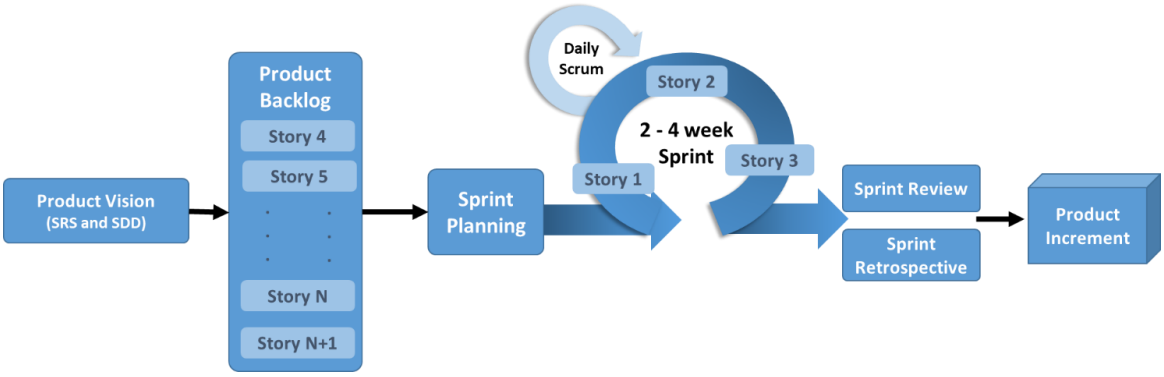

Figure-III: Agile based system development processes

ii. Functional and Integration Testing

Once the system is developed based on the requirement specification, QA engineers will test the system thoroughly for all the functions of the system. Functional testing is the process through which QAs determine if a piece of software is acting in accordance with predetermined requirements. It uses black-box testing techniques, in which the tester has no knowledge of the internal system logic.

D. Pilot Testing, Feedback Integration, Hosting and User Manual Development

A system testing workshop will be organized to demonstrate, orient the features of the system and let a group of users test the system themselves thoroughly in one of the pilot projects. Feedback from the users will be collected to make the system more user-friendly. During this system testing workshop, key stakeholders will also be invited to provide their feedback. Then, all relevant feedback will be incorporated in the system. The co-ordination efforts have to be executed by NEPAL CRS COMPANY.

Finally, the system will be hosted in the NEPAL CRS COMPANY Web Server with a given domain name to make it publicly accessible. The finalized software will be deployed in the server with all necessary security standards in place like firewall configuration, SSL certificate, and appropriate security HTTP Headers. All the access and third party domain registrations, SSL certs etc should be provided by NEPAL CRS COMPANY. This can be done either by NEPAL CRS COMPANY IT team or executed on behalf of NEPAL CRS COMPANY by Pathway team.

Also, a User Manual will be developed for the end-users of the system. This user manual will consist of a step-by-step process to use the system based on the roles assigned to different users. A list of FAQs will be also included in the User Manual along with troubleshooting steps.

E. Capacity Building

In order to operationalize QA/QI, end-users of the system especially users from NEPAL CRS COMPANY will be trained to use the web based software. We will conduct Training of Tutors (ToT) so that the designated users can roll out capacity building and how-tos to local government as well as all other relevant stakeholders.

Two sessions of on-site training within Kathmandu valley can be organized to cater training needs. If required, additional trainings can be conducted via digital medium.

I. Support and Maintenance for first year after launching of QA/QI

As part of the warranty of the system, there will be continuous technical support to fix bugs and for any other minor updates for one year after the submission of completion report. Any required support after that will be provided based on the annual maintenance contract.

J. Annual Maintenance Service and Feature Enhancement based on feedback from NEPAL CRS COMPANY

As the system is implemented, and expiration of the contract period, it is quite apparent that there will be a need to update the system based on experience of users. As our organization is highly focused on providing ICT services, we would like to provide our commitment to make required changes and feature enhancement based on the feedback and suggestions from NEPAL CRS COMPANY and other stakeholders. We can create an Annual Maintenance Contract (AMC) for such provisions.

8. Detailed Work Plan

Work plan activities of the establishment of QA/QI have been divided into six phases for the development, deployment, capacity building and further implementation of QA/QI with 2 months of support as shown in the work plan chart presented below. Input days from experts have been planned in an optimistic way, considering the smooth execution of the activities according to plan without much delays in coordination and communication related activities.
These phases have been further divided into set of activities with specific output is presented as below:

Activity	Tasks	Deliverable	Week						
			1	2	3	4	5	6	7
Requirement Analysis and Design	Kick Off Meeting and further clarification from CRS Nepal								
	templates								
	System Architecture Design and documentation								
	Use Case Scenario Finalization and Documentation								
		Project Inception Report							
Implementation	Database Design with TSQL, Functions and Views								
	Framework Design with Web APIs using ASP.NET Core with C#								
	Business Layer Implementation derived from Inception Phase								
	Front-End coding and implementation using Angular 14								
	Android App coding and implementation using Kotlin								
	Web								
		Beta Phase working version of software							
Testing	Integration Testing (Dev Level)								
	UAT Testing (Closed group users from CRS Nepal)								
Deployment	UAT Deployment of Web based QA/QI software								
	Production Deployment in Web Server								
	Store								
		Live Version of software and mobile app							
Training	Training Materials or User Manuals sharing								
	Hands-on ToT (inside Ktm valley) OR online medium								
		Final Project Report							
Support									Next 4 months