Terms of Reference (TOR) for Software Development Firm

Project Title: Development of Ghana Integrated Social Protection Information System (GISPIS)

1. Introduction

The Ministry of Gender, Children, and Social Protection (MoGCSP) is responsible for social protection (SP) programs in Ghana. It coordinates SP initiatives to ensure the well-being of Ghanaians, particularly marginalized groups, through effective social protection policies and interventions and resource allocation.

MoGCSP is committed to creating a society where gender equality, child welfare, and social inclusion are guaranteed. Its mission is to support these goals by developing systems and strategies that enhance policy coordination, improve service delivery, and strengthen social protection for vulnerable populations.

2. Problem Statement

MoGCSP's current information systems are fragmented, with various Social Protection programs and other systems operating in silos. These siloed systems limit data accessibility, hinder coordination, and make it challenging to manage and monitor SP programs comprehensively and effectively. Key issues include:

- **Data Fragmentation:** Information is dispersed across multiple systems without a unified platform for data sharing.

- **Limited Interoperability:** Peer-to-peer connections between systems create dependency issues and prevent seamless data integration.

- **Reduced Efficiency:** Siloed systems prevent MoGCSP from delivering coordinated services, increasing the risk of duplicated efforts and missed opportunities for integrated support.

- **Duplicated Infrastructure:** The current approach, where each program independently procures and maintains its respective servers, is inefficient and costly. This results in high expenses, limited scalability, resource redundancy, and complicated IT management.

3. Objectives

The integrated system project aims to:

- **Create a Unified Data Exchange Platform:** Integrate MoGCSP's SP systems into a single, accessible platform that centralizes data management, streamline operations, and enables consistent reporting.

- **Enhance Interoperability and Data Quality:** Link SP systems with the National ID Registry and other key national databases to improve data accuracy, ensure beneficiary verification, and reduce data redundancies.

- **Enable Real-time Monitoring and Analytics:** Utilize a centralized dashboard for real-time program monitoring, resource tracking, and data visualization to support evidence-based decision-making.

- **Improve Service Delivery Efficiency:** Simplify SP workflows, enhance cross-program referrals, and reduce bureaucratic delays, resulting in faster and more effective services for beneficiaries.

4.0 Scope of Work

The project will involve the development and implementation of the following components:

4.1 Ghana Integrated Social Protection Information System (GISPIS)

- A unified platform that integrates key SP systems, standardized processes, and centralized data.
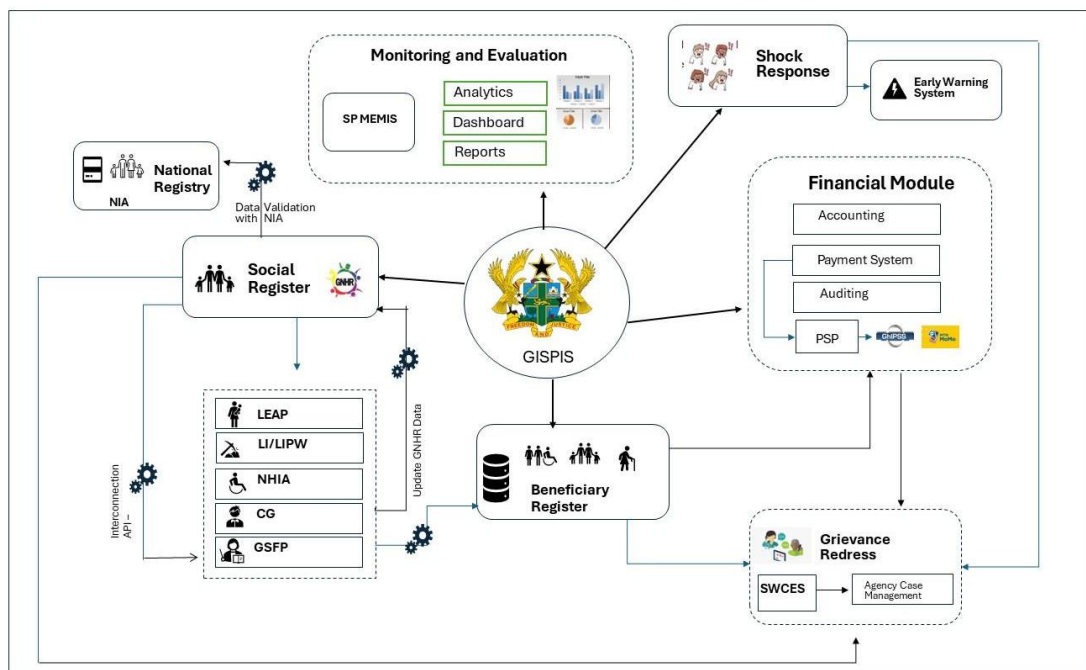

Figure 1- GIPIS Architecture

4.2 MoGCSP Integrated Dashboard

- An analytics-focused dashboard that consolidates data on gender statistics, vulnerability metrics, and child rights from multiple departments.

- The dashboard will provide insights through data warehousing and ETL processes, data mining, and business intelligence tools for improved decision-making.
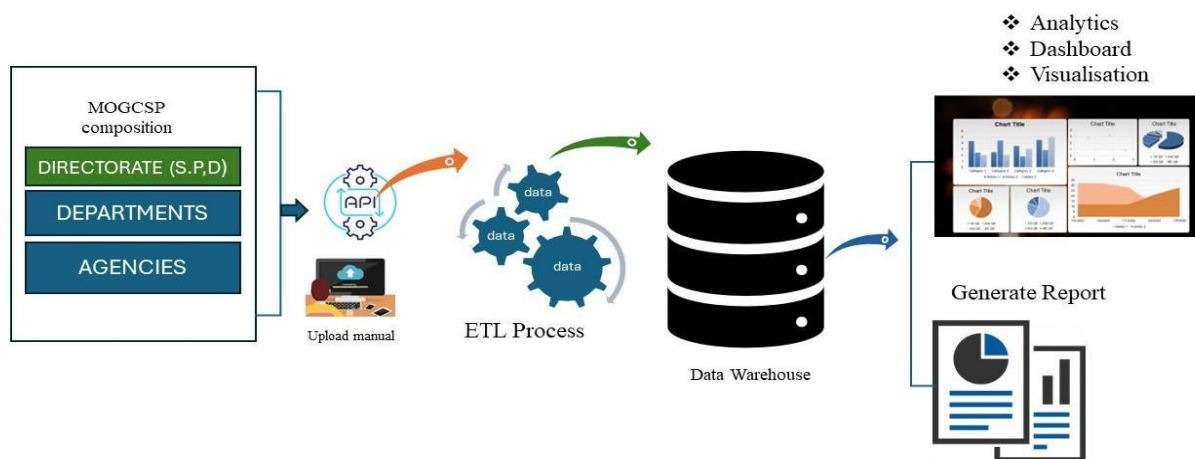
Figure 2- proposed architecture of the Integrated Dashboard.

4.3 Design and Set up Interoperability between Case Management Systems.

The Ministry Administers Single Windows Citizenship Engagement Service (SWCES) for Case Management systems for Grievance Redress, Social Welfare Information Management System (SWIMS) for Social Welfare and Family Welfare and Orange Support Centre for Domestic Violence Cases. This component seeks to create interoperability between these systems to enhance grievance redress coordination and case management processes.

4.4 Infrastructure Integration

- Integrating infrastructure offers a unified, scalable, and cost-effective solution. By pooling resources into a shared environment, programs can benefit from improved efficiency, cost savings, streamlined maintenance, and the flexibility to scale resources as required.

4.5 Political, Institutional, and Legal Environment for Integration

- This component will focus on ensuring alignment with Ghana's national social protection policy framework, relevant legislation, and institutional mandates. It will involve:
    - Mapping existing legal and regulatory frameworks related to data privacy, data sharing, and child protection.
    - Assessing the institutional capacity of key stakeholders to participate in and manage the integrated system.
    - Developing strategies to address potential political and institutional barriers to integration, including advocacy and stakeholder engagement.
    - Establishing clear data governance structures and protocols to ensure responsible data management and use. This may involve creating new data-sharing agreements, clarifying data ownership and access rights, and establishing mechanisms for data security and privacy.

o   Developing a comprehensive change management plan to facilitate the smooth transition to the new integrated system.

5. Integration Approaches

5.1 Existing Approach: Peer-to-Peer Integration

- MoGCSP's systems are currently integrated using a peer-to-peer (P2P) approach, which has limitations such as tight coupling, scalability issues, and data inconsistencies.

5.2 Transition Phase: Enterprise Service Bus (ESB) Architecture

- The next phase will adopt an ESB architecture, where a centralized ESB serves as a communication hub, facilitating consistent, real-time data exchange.

- See Figure 3 in the Concept Note for the ESB architecture.

5.3 Future State: Microservices Architecture

- The final phase will adopt a microservices-based architecture, decomposing core functionalities into independent, self-contained services.

5.4 Technical Integration Pathway

- To achieve a seamless transition, MoGCSP will strengthen existing P2P integrations, develop and deploy the ESB, identify core services for microservices development, and gradually transition to a fully decentralized architecture.

6. Hardware Integration

- The project proposes transitioning to a centralized computing cluster, consolidating individual servers into a high-performance cluster. This will improve resource utilization, enhance scalability and flexibility, simplify management, and potentially lead to cost savings.

7. Existing Systems and Their Role in Integration

- Several existing Management Information Systems (MISs) will play a critical role in the integration process. These include:

    o   Ghana National Household Registry (GNHR)

    o   Livelihood Empowerment Against Poverty (LEAP)

    o   Labour Intensive Public Works (LIPW)

    o   Productive Inclusion (PI)

    o   Social Protection Single Window Citizens Service (SWCES)

    o   Social Protection Monitoring and Evaluation Management Information System (SP MEMIS)

    o   Ministry Dashboard

- o National Identification Authority (NIA) Database

- o Ghana Interbank Payment and Settlement System (GhIPSS) and e-Zwich

- o National Health Insurance Authority (NHIA)

- o Ghana School Feeding Program (GSFP)

- o Capitation Grant

- o Social Welfare Information Management System (SWIMS)

- o Gulf of Guinea Northern Regions Social Cohesion (SOCO) Project

8. Deliverables

The firm will be responsible for delivering the following outputs to ensure the successful development, deployment, and maintenance of the Ghana Integrated Social Protection Information System (GISPIS):

a) Inception Report

    a. A detailed report outlining the firm's understanding of the project objectives, scope, timeline, and initial findings.

    b. Includes a refined project plan, methodology, key milestones, risk assessment, and stakeholder engagement strategy.

    c. A presentation to MoGCSP and relevant stakeholders for validation and feedback within 30 days of contract signing.

b) System Requirements Specification (SRS) Document

    a. Detailed documentation of all technical and functional requirements for GISPIS, covering interoperability, security, data standards, and integration points.

    b. Includes process flow diagrams, data flow diagrams, and system architecture documentation.

    c. Completed after thorough requirements gathering with all stakeholders.

c) GISPIS System Design Document

    a. A comprehensive design document detailing the system architecture, integration protocols, database schemas, API specifications, and security measures.

    b. Includes design mock-ups for the user interface, dashboard, and data visualization tools.

d) Interim Progress Reports

    a. Regular progress reports, submitted monthly, covering development updates, challenges, risk mitigation actions, and upcoming milestones.

b. Reports to include a summary of technical developments, engagement with MoGCSP, and any adjustments made to project plans.

e) Prototype/Proof of Concept

a. Development and presentation of a prototype or proof of concept for core GISPIS functionalities, including data integration, dashboard interfaces, and user interaction features.

b. Feedback from stakeholders will guide refinements to the design and functionality before full-scale development.

f) Fully Functional GISPIS Platform

a. A unified, integrated platform that centralizes MoGCSP's SP systems, with capabilities for data exchange, case management, beneficiary tracking, and grievance redress.

b. Modules for real-time analytics, financial tracking, and beneficiary verification, integrated with National ID Registry and payment systems.

c. Configured and ready for user testing.

g) MoGCSP Integrated Dashboard

a. A comprehensive dashboard displaying real-time data on key social protection metrics, such as gender statistics, child welfare, and vulnerability data.

b. Includes data warehousing, ETL processes, and business intelligence (BI) tools for advanced data analysis and visualization.

h) Data Security and Compliance Framework

a. Development and implementation of data security protocols covering encryption, secure data access, and compliance with Ghana's data protection laws.

b. Includes policies for data governance, data-sharing agreements, and protocols for data ownership and access rights.

i) Training Materials and Capacity Building

a. Comprehensive training manuals, user guides, and system documentation for MoGCSP staff.

b. Conducting in-person or virtual workshops to train relevant staff on using GISPIS, managing data, and generating reports through the dashboard.

c. Provision of follow-up support for trained staff, including help desk and troubleshooting services.

j) Testing and Quality Assurance Reports

a. Detailed reports on system integration, functionality, and user acceptance tests (UAT).

b. Security testing and data validation reports to ensure data accuracy, system integrity, and regulatory compliance.

c. Reports on feedback from UAT sessions with stakeholders, including issue logs and resolution steps.

k) User Acceptance Testing (UAT) Report

a. Documentation of the UAT process, with detailed feedback from MoGCSP and stakeholders.

b. Final adjustments to the system based on UAT results to ensure all functionalities meet user requirements and expectations.

l) Monitoring & Evaluation Dashboard and KPIs

a. Set up a real-time monitoring dashboard with key performance indicators (KPIs) for system usage, service delivery metrics, and social protection impact.

b. M&E framework document detailing data sources, indicators, and methodology for ongoing evaluation of GISPIS performance.

m) Final Project Report and Documentation

a. A comprehensive final report summarizing the project's outcomes, achievements, and challenges encountered.

b. All system documentation, including codebase documentation, data schemas, configuration files, and user manuals.

c. Recommendations for future system enhancements, scalability, and any lessons learned.

n) Post-Implementation Support and Maintenance Plan

a. Provide a clear plan for post-implementation support, including a timeline for ongoing system updates, security patches, and troubleshooting.

b. Documentation of a maintenance schedule, user support channels, and escalation procedures for critical issues.

o) Project Close-Out and Knowledge Transfer

o Conduct a project close-out workshop with MoGCSP and stakeholders, summarizing project achievements and providing a formal handover of system responsibilities.

o Knowledge transfer sessions to MoGCSP's IT team and other relevant staff for continuity and smooth transition to in-house management.

10 Firm Experience and Qualifications

The selected firm must demonstrate substantial experience and expertise in developing large-scale, integrated information systems with a focus on data integration, security, and interoperability. The following qualifications are required:

1. **Experience with Similar Projects**

   o Minimum of **10 years** of experience in software development and system integration.

   o Proven track record of developing integrated management information systems (MIS) in **social protection, public administration, or government services**.

   o Demonstrated experience with **data warehousing, API development, and enterprise service bus (ESB) architectures**.

   o Experience in managing projects with **multiple stakeholders** across various sectors, including government entities and international partners.

   o Experience in Data Warehouse and Data mining would be an added advantage.

2. **Technical Expertise**

   o Expertise in designing and implementing **scalable, high-performance systems** that can support data integration from multiple sources.

   o Strong understanding of **data security and regulatory compliance** requirements, especially concerning data protection laws, privacy, and secure access protocols.

   o Familiarity with Ghana's social protection landscape and technical standards, including **National ID integration** and interoperability with local and national databases.

   o Proficiency in **cloud computing** and virtualization technologies to support scalable, cost-effective infrastructure solutions.

   o Extensive knowledge of **business intelligence (BI)** and **data analytics** for dashboard development and real-time data visualization.

3. **Project Management and Methodology**

   o The firm should apply **agile development methodologies**, emphasizing iterative development, stakeholder feedback, and flexibility.

   o Ability to establish clear project management frameworks, reporting mechanisms, and risk management strategies to ensure timely and effective project delivery.

   o Demonstrated experience in conducting **stakeholder engagement**, training, and capacity-building initiatives, with a focus on change management and knowledge transfer.

4. **Post-Implementation Support**

   o Commitment to provide **ongoing technical support** after deployment, including troubleshooting, system upgrades, and enhancement as per the evolving requirements of MoGCSP.

   o Experience in creating and executing **maintenance schedules, user support plans, and quality assurance** for government or large organizational systems.

5. **Firm's Staff and Capacity**

   o A dedicated team with expertise in the following areas: **software architecture, data integration, database management, cybersecurity, UI/UX design, testing, quality assurance, and training**.

   o Ability to scale resources and staff as needed to meet project demands.

11. Staffing Requirements

The firm should provide a qualified team with the following roles and expertise:

Position	Key Responsibilities	Minimum Qualifications
Project Manager	Oversee project execution, stakeholder engagement, and compliance.	Master's in Project Management / IT Project Management or relevant field, 10+ years of experience.
Business / System Analyst	Oversee the Requirement Gathering, System Analysis and Design	Certified Business Analysis Professional (CBAP), / Certified Capabilities in Business Analysis (CCBA)
Lead Software Developer	Design the system architecture, including interoperability protocols, Develop APIs and integration protocols.	Master's in Computer Science, Information Technology, 10+ years of experience in large-scale integrations.
Data Analyst	Design Dashboard, Data Analysis, and Data Sharing Protocols	Bachelor's in Information Technology / Professional Qualification Equivalence, 5+ years in data integration projects.
Database Administrator	Manage data warehousing, ETL processes, and database security.	Bachelor's in Computer Science / Professional Qualification Equivalence, 5+ years in database management.
Cybersecurity Specialist	Design and implement data security measures.	Certified Information Security Professional (CISP)/ Certified Information Security

Position	Key Responsibilities	Minimum Qualifications
		Manger (CSIM) / Certified Information Systems Security Professional (CISSP)/ CompTia Security (PenTest Plus, Cyber Security Analyst) 5+ years in cybersecurity .
Frontend Developer	Develop user interfaces for the dashboard and GISPIS modules using frameworks such as Angular, React, Vuejs	Bachelor's in Web Development / Professional Qualification Equivalence, 3+ years of experience.
Backend Developer	Develop backend logic, data processing, and server-side functionality.	Bachelor's in Software Engineering / Professional Qualification Equivalence, 3+ years of experience.
Quality Assurance (QA) Specialist	Conduct testing, quality assurance, and user acceptance tests (UAT).	Bachelor's in Quality Assurance / Professional Qualification Equivalence, 5+ years of experience.
Training Coordinator	Lead training sessions and develop instructional materials.	Bachelors in education/IT, 3+ years in training delivery.

12 Proposed Payment Schedule

Payment Milestone	Deliverables Included	Percentage of Total Payment	Expected Timeline
1st Payment: Project Initiation (20%)	- Inception Report - System Requirements Specification (SRS) Document	**20%**	Three weeks
2nd Payment: System Design and Initial Prototype (20%)	- GISPIS System Design Document - Interim Progress Reports (first two months) - Prototype/Proof of Concept for key functionalities	**20%**	Three Weeks
3rd Payment: Development Phase Completion (25%)	- Fully Functional GISPIS Platform - MoGCSP Integrated Dashboard	**25%**	Eight Weeks

Payment Milestone	Deliverables Included	Percentage of Total Payment	Expected Timeline
	- Interim Progress Reports (next three months)		
4th Payment: Testing, QA, and Training (20%)	- Data Security and Compliance Framework - Testing and Quality Assurance Reports - User Acceptance Testing (UAT) Report - Training Materials and Capacity Building	**20%**	Four weeks
5th Payment: Project Completion and Close-Out (15%)	- Final Project Report and Documentation - Monitoring & Evaluation Dashboard and KPIs - Post-Implementation Support and Maintenance Plan - Project Close-Out and Knowledge Transfer	**15%**	Six weeks

Explanation of Payment Milestones

1. **1st Payment (20%)**: Upon submission and approval of the Inception Report and the System Requirements Specification (SRS) Document, ensuring alignment on project scope and requirements.

2. **2nd Payment (20%)**: Upon completion of the System Design Document and successful delivery of an initial Prototype or Proof of Concept. This milestone confirms the foundational architecture and initial functionalities are on track.

3. **3rd Payment (25%)**: Upon completion of the core development phase, delivery of a fully functional GISPIS Platform, and the MoGCSP Integrated Dashboard. At this point, the main functionalities should be operational and ready for testing.

4. **4th Payment (20%)**: After successful testing, quality assurance, and training. This milestone ensures that the system meets quality standards, and that staff are prepared to operate it.

5. **5th Payment (15%)**: Following project closure, knowledge transfer, and the final project handover, including all documentation and support plans, ensuring a smooth transition to in-house management.

10. Proposal Evaluation Criteria

The criteria below will guide the evaluation of the technical & financial proposals

Evaluation Category	Criteria
1. Technical Expertise and Experience	- Demonstrated experience in developing and implementing large-scale, integrated information systems. - Proven track record in social protection, public administration, or government sector projects. - Specific experience with data warehousing, API development, ESB architectures, and enterprise systems for government or social protection. - Knowledge of Ghana's data protection laws and experience with secure data handling and compliance frameworks.
2. Understanding of Project Requirements	- Clear understanding of GISPIS objectives, requirements, and expected outcomes. - Comprehensive response to the scope of work, showcasing awareness of data integration, interoperability challenges, and security needs. - Methodology proposed for addressing stakeholder engagement, change management, and training requirements. - Realistic and achievable project timeline and milestones.
3. Proposed Methodology and Approach	- Use of agile or iterative development methodologies to ensure flexibility and regular feedback. - Detailed project management plan, including risk management, quality assurance, and documentation processes. - Technical integration approach, specifying how the firm will handle system interoperability, real-time analytics, and data visualization. - Well-defined post-implementation support plan for system maintenance, troubleshooting, and enhancements.
4. Qualifications and Expertise of Proposed Team	- Relevant qualifications and experience of key personnel (e.g., Project Manager, System Analyst /Software Architect, Data Analyst, Cybersecurity Specialist). - Experience of the team in similar projects, particularly those involving social protection or public sector systems. - Ability to scale resources and adapt the team composition as the project progresses. - Certification in relevant areas (e.g., cybersecurity, data privacy) where applicable.
5. Cost and Cost-effectiveness	- Proposed cost relative to the project scope and deliverables. - Breakdown of costs for transparency, including development,

Evaluation Category	Criteria
	testing, training, and post-implementation support. - Cost-effectiveness in terms of quality and sustainability of the solution, including consideration of long-term maintenance and operational costs. - Inclusion of contingency costs or additional services as part of the proposal.

Legal Framework

All data collected will be managed in line with the Data Protection Act 2012 and MoGCSP ICT Policy, NITA Regulatory frameworks.

Technology Transfer

The firm shall work closely with the MoGCSP IT team, the Social Protection and the Research Directorates during the project period, this is to harness the transfer of technology, capacity building and support.

Ownership of Source Code

The firm is required to hand over the final source code product. The final product: source code, intellectual property, documentation, hosting account and all items specific to this product will be under the MoGCSP exclusive ownership. In exceptional circumstances where source code has already been developed for a product, the MoGCSP is open to partnership discussions around source code ownership. The firm shall be required to save the source code and work from the MoGCSP-owned GITHUB/ GITLAB environment.