Software Requirements Specification document

for

<IMPROVING OFFICIAL STATISTICS CONSISTENCY THROUGH ENHANCING E-SYSTEMS AND DATA SYSTEMIZATION (CS-2.1.1-3)>

Mongolian EITI Secretariat 2023

The main reasons for upgrading the system

Due to the lack of regular maintenance and improvement since the initial development of the system, the next level of development and improvements has become necessary. The system has the following requirements in the current situation:

- Making all types of data received by the system available for public download in open data format. There is no such possibility now. Exports of reports, except for the "Detailed Report" after the Reconciliation no longer work;
- Develop a dashboard that displays data summaries that can be shared on social networks;
- Development "Research Analysis" and "Feedback" /Figure 1.1/ modules no longer work due to the deprecated software technologies;
- Develop open data exporting modules for the data of the annual report using API and web interface;;
- The quality of the data is not good enough;s
- Improvement of the user experience, user interface, and design (UX/UI) of the system is required;
- Develop interconnecting modules between systems of other government agencies. In particular, to connect with the Single Sign On of the ITC;; (*https://auth.itc.gov.mn/*)

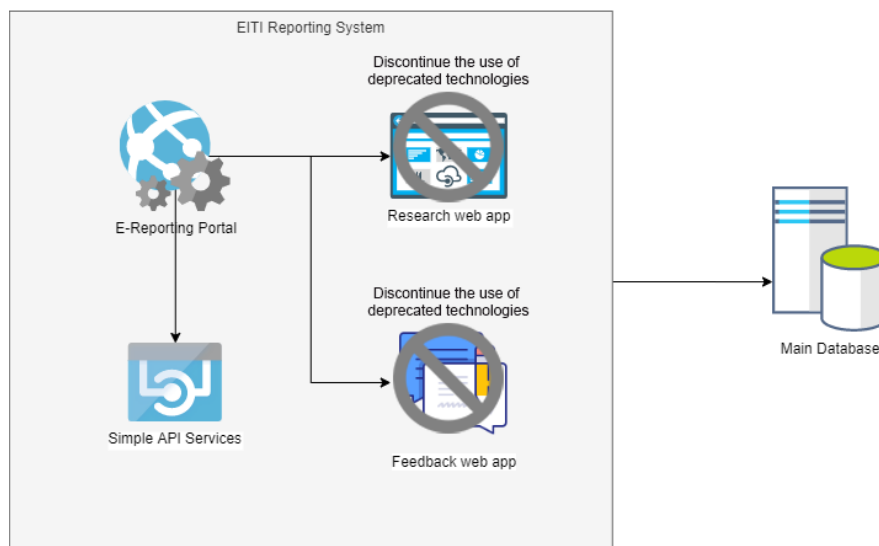*Figure 1.1*

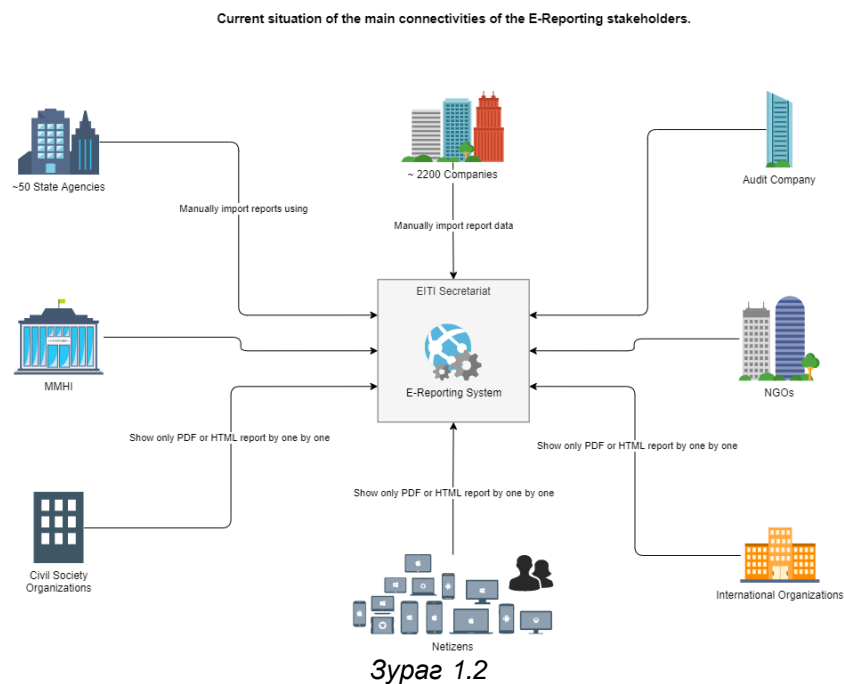# Abbreviated and technological words explanation

EITI – Extractive Industry Transparency Initiative;
MMHI – Mongolia Ministry of Mining and Heavy Industry;
MRPAM – Mineral Resources and Petroleum Authority;
MTA – Mongolia Taxation Authority /General Department of Taxation/;
CGA – Customs General Authority;
GASR - General Authority of State Registration
GDSI – General Department of Social Insurance;
E-Reporting system – E-Reporting system of EITI;
E-Reporting 1.5 – This requirement refers to a software version that is intended to improve the system and update some parts of the system according to this document;
LTMS – Law on transparency in mineral resources sector;
GO – Governor's Office;
UX/UI – User experience/User interface;
API – Application programming interface;
Back-end – Server side application;
Front-end – Client side application;
License – Referred to in this requirement is understood to include all minerals, radioactive minerals, licenses for common minerals, and oil production sharing agreements;
License holder – Mining license holder or company with the product sharing agreement;
SSO – Single Sign On;
GIS – Geographical Information System;
PSA – Product sharing agreement;
ID – Identification number;
IP v4 – Internet protocol version 4;
Cronjob – The server-side application works automatically at the scheduled time;
Database Table – Database objects that contain all the data in a database.
Database View – The result set of a stored query on the data;
Restful – Representational state transfer;
Design Sprint – An intense 5-day process where user-centered teams tackle design problems;
CSV - Comma-separated values;
SQL – Structured Query Language;
Query – Arequest for information from a database management system (DBMS), which is the software program that maintains data;
Stored procedure – A set of Structured Query Language (SQL) statements with an assigned name, which are stored in a relational database management system (RDBMS) as a group, so it can be reused and shared by multiple programs;
PIU – Project Implementation Unit;
MET – Ministry of Environment and Tourism

System stakeholders

The system stakeholders are listed below:
- EITI Secretariat;
- All companies holding the extractive sector licenses and holding oil and coal gas agreements;
- State agencies;
- Authority of the districts and Aimags;
- People who want to use EITI data;
- A professional Auditing company responsible for the Reconciliation of EITI annual reports;
- Software development company in charge of the system regular maintenance;

Current situation of the main connectivities of the E-Reporting stakeholders.

Зураг 1.2

References

EITI Official website – https://www.eitimongolia.m/
E-Reporting system – https://ereporting.eitimongolia.mn/
International EITI - https://eiti.org/
MMHI – https://mmhi.gov.mn/

OVERALL DESCRIPTION

Product Perspective

The E-Reporting system has been storing EITI data since 2006 and expands year by year. This requirement aims to upgrade and improve the current modules and the issues of the E-Reporting system and develop new necessary modules. The system perspective is planned to be the main modules below: /*Figure 2.1*/

1. Required upgrades to the main reporting system;
2. API module for exchanging necessary information with government agencies;
3. API module for third-party applications;
4. The module for exporting available data in an open data format;
5. Feedback module;
6. Research and analysis module;
7. Social friendly infographics module;
8. Mobile backend app;
9. Mobile app;
10. Database changes;
11. Storage and backup database;
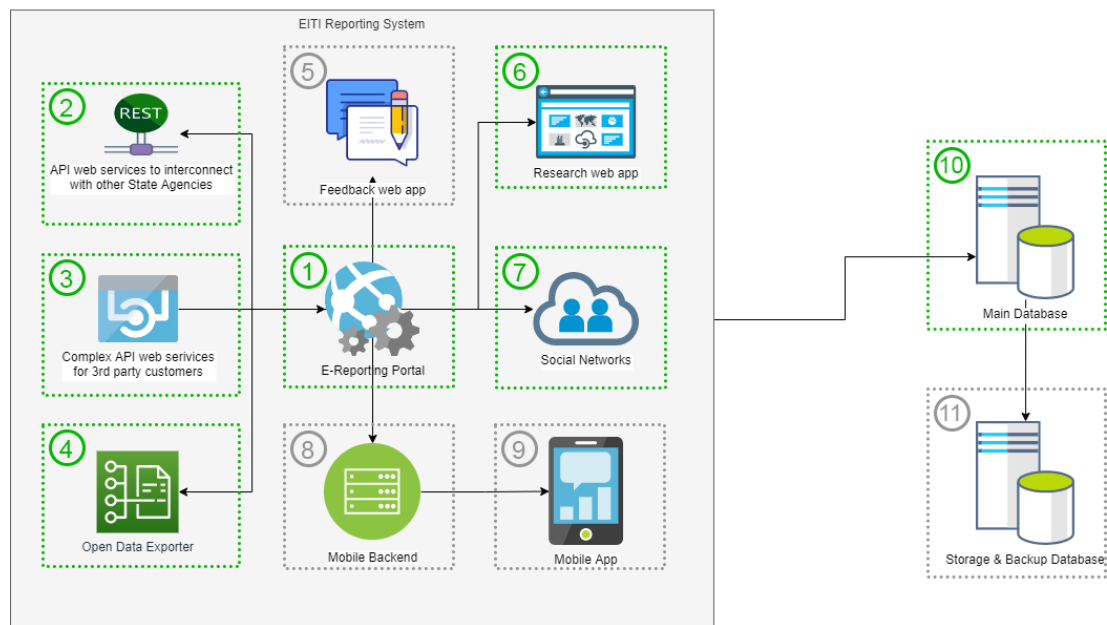
Зураг 2.1

The following developments that are marked in green in Figure 2.1 will be perform within this document:

1). Required upgrades to the main reporting system /Activity 1/;
2). API module for exchanging necessary information with government agencies /Activity 2/;
3). API module for third-party applications /Activity 3/;
4). The module for exporting available data in an open data format /Activity 4/;
6). Research and analysis module /Activity 5/;
7). Social friendly infographics module /Activity 6/;
10). Database changes /Activity 7/.

User Classes and Characteristics

The system users will be classified as follows:

No	System user	Description	Access frequency
1	Super admin	A single-user privilege to operate all currently available administrative functions of the system.	Daily
2	Moderator	Admin user with privileges to view and edit company information, view report information, view license information, view report information, approve registration requests, etc.	Daily
3	Company user	A privilege to access data related to the company and the license(s) it holds.	Access the system in the first quarter of each year, during the reporting period.
4	Audit user	A privilege that views and verifies data reported by companies and government agencies.	Frequently accessed during the reconciliation is been processed.
5	State agencies user	A privilege to import the data related to the report form of the government organization.	Access the system in the first quarter of each year, during the reporting period.
6	Test user	A privilege to do tests.	During development and when the report form is changed.

Operating Environment

Server and technical requirements.

Operating System: CentOS 8.5 or higher; Ubuntu Server 22.04 or higher
Web server: Nginx 1.2 or higher
Programming language: PHP 5.6 or higher, JQuery, If using a new programming language, use the latest stable version.
Фрэймворк: Symfony 2.3 or higher, If using a new framwork, use the latest stable version.
Database: PostgreSQL 14.2 or higher, If using a new database, use the latest stable version.

Design and Implementation Constraints

System design renewal requirements:
- Perform the Design Sprint with all the stakeholders for design renewals and revisions;
- Develop the User Experience that will require the fewest action possible for the consumer;
- Develop UX/UI in simple and well designed for users;

Source code requirements:
- Adherence to commonly used international code standards;
- Privacy and security are well performed;
- Data is only available through the main MVC framework;
- A single web request should not exceed 40MB of RAM;

- APIs will use Restful or GraphQL technologies;

Database requirements:
- Perform database optimization, improvements of the structure, and relations.;
- Store calculated data in a View for display in reports and graphs. Create a cronjob to collect View data at a certain frequency;

Server OS app and Web server app:
- Perform web server configuration optimization;
- Only web server and SFTP ports will be opened;
- Perform optimization of web server plugin which connects to the main programming language;

Documentations

- Main contract of the consulting service;
- Service level agreement of after service /SLA/;
- User guidance of newly developed modules and upgraded modules;
- API documentations;
- Database ERD, Application Sequence, and Use Case diagrams;

Assumptions and Dependencies

The system will connect to the following third-party applications:

- Single Sign of ITC. https://auth.itc.gov.mn/
- Google Map – The payment will include in the SLA.
- Google Analytics.
- Google Developer Console – Search Engine Optimization тохиргоо, холболт. Төлбөргүй.
- Arc.js. The project implementation unit will pay the license fee.
- Amazon SES – The payment will include in the SLA.
- Facebook chat.
- Social platforms /Facebook, Twitter, Youtube etc…/.
- Open-source libraries for the Dashboards.

Third-party systems dependencies:

- All the libraries must be located on the E-Reporting system's server;
- Web requests must work without third-party systems dependencies. If the request needs to wait for the response of a third-party system such as an email service, put the data in the database queue. Thus perform the action using the Cronjob schedule;

DETAILED REQUIREMENTS

This section details the general requirements specified in Section 2.2 of this requirements document. The importance of the requirements was evaluated on a scale of 1-6:

- **6** – Must to have.
- **5** - Very important.
- **4** – Important.
- **3** – Perform after the more important requirements.
- **2** – Nice to have.
- **1** – Nice to have. The requirement can be skipped by discussing it with PIU.

1. Activity 1 – Upgrading, bug fixing, and UI/UX improvements

1.1 General description

The Consultant will:

(i)   Do Design Sprint for necessary sections in the presence of stakeholders before the development process.

(ii)   Develop upgrades to required modules of the E-Reporting system.

(iii)   Fix existing bugs.

1.2 The bug list

Current system bugs are listed in "**Appendix B**".

1.3 Functional requirements

Code	Requirement name	Description	Importance
REQ-1.1	Company report details	To show company report data as defined in the template.	6
REQ-1.2	Download company report	To download report data defined in REQ-1.1 in the formats PDF, Excel, and XML.	5
REQ-1.3	Admin user management	To develop the system user management module in the Administration section.	3
REQ-1.4	Single Sign On	Connect to the SSO of ITC. And migrate existing user information.	6
REQ-1.5	Logis as authentication	Super admin can be authenticated with the same credentials as a certain user.	2
REQ-1.6	Display extended reports	Display company reports that have been approved for extension requests in the Open Reports section.	1
REQ-1.7	Confirmation on the Duplicate action	When the admin clicks the duplicate button of the report structure, the confirmation window must be displayed.	1
REQ-1.8	Fix the Infographics	Fix the infographics and their data on the home page and sidebar.	5
REQ-1.9	Reports by each template	In the report section, export report data by each report template appendices, as	5

	appendices and by year.	well as grouped by year, company, and region. Export the relevant information such as the company name, registration number, license number, and license location.	
REQ-1.10	Data clearance	Fix and clear data stored in different tables in the database related to the new template design and store it in one table. As it is currently known, information is stored separately in the "AUDIT_ADDITIONAL_DATA" and "REPORT_DATA_EXTRACTED" tables of the database.	5
REQ-1.11	Alert when user inputs in thousands or in millions	Now, always alert is displayed when the save button is clicked. Warn when a user enters the number value in thousands or millions.	5
REQ-1.12	Categorize the required appendices by company types	Categorize the required appendices by company types such as state-owned, exploration license owning, production license owning, and operation is started or not.	6
REQ-1.13	Admin module - Configure required appendices.	Develop the administration module of REQ-1.12 section on the Admin side.	6
REQ-1.14	Make steps in reporting section	Bundle appendices by the types and set steps on them.	4
REQ-1.15	Simplify the process of filling out appendices	Develop UX/UI for fill appendices step-by-step without clicking through multiple actions.	4
REQ-1.16	Make a possibility license holder can be a subcontractor of another license holder	The license holder can register another license holder as a subcontractor. Super admin can show the subcontractor registration log.	4
REQ-1.17	Set masks on the inputs	Set masks on the inputs such as mobile, email, etc...	5
REQ-1.18	Display company activity type	Display the company activity type on the detailed report page and the appendices mentioned in REQ-1.9.	4
REQ-1.19	Connect to GASR	Get beneficial ownership data and company registration data connecting to GASR.	5
REQ-1.20	Hover effect on the tables	Every data table must have a row hover effect.	2

REQ-1.21	Reports of non-reporting and reporting companies	Reports of non-reporting and reporting companies with the year filter.	4
REQ-1.22	Copy data from the previous reports	Customers can fill inputs of the template with data from the previous reports using a single click.	4
REQ-1.23	Make it possible to input foreign company addresses	Make it possible to enter a foreign address in case of a joint venture with a foreign company.	3
REQ-1.24	Automated notifications	The system will send automated notifications using admin configuration during the reporting period.	4
REQ-1.25	The description of column title mouse hover	Display description tooltip menu on columns title hover effect.	5
REQ-1.26	Develop the module to import common minerals	Develop the module to import common minerals. Or fix current broken coding sections.	5
REQ-1.27	Redevelop module replace current Java application.	Delete Java application works calling SOAP web services. And develop a module that will replace the removed Java application's operations.	6
REQ-1.28	Get address template data from the main registration.	To get address information from the main register in addition to what is specified in REQ-1.22.	3
REQ-1.29	Show report progress in admin section.	Develop a graphical progress dashboard that displays counters of reported and not reported status of companies and state agencies.	5
REQ-1.30	Improve the appendix of the Beneficial Ownership	Make the nomenclature and description of BO appendix forms very clear And improve form validations.	6
REQ-1.31	Improve validation of required fields of appendices for data quality	To determine required fields discussion PIU according to the company operation status. And validate these fields.	6
REQ-1.32	To complete required registration info after the Single Sign On.	After the Single Sign On login, the system must require additional information.	6

REQ-1.33	Register information on changed owners, and newly registered, and canceled licenses	Register information on changed owners, newly registered, and suspended licenses using daily Cronjob.	3
REQ-1.34	To solve the problem of the missing register for entering reports of state agencies	When entering a registration number that does not exist in the E-Reporting system when submitting a state agency's report, skip it, receive correct information, and make it possible to enter data with a corrected registration number.	5
REQ-1.35	Develop unfilled stat with each appendices	Export report that includes specific appendix data, and is filterable by year and other necessary fields.	5
REQ-1.36	Reports for old template appendices	Develop reports the same as REQ-1.9 and REQ-1.35 from old templates.	6
REQ-1.37	Auto-add rows on the appendices with license info	When customers fill the appendix with license info, the rows will be generated by the number of licenses held.	5
REQ-1.38	Warn when customer inputs too large numbers	Warn when customer inputs too large numbers such as more than state budget, more than top taxpayer of Mongolia, etc...	4
REQ-1.39	Develop a report that displays state agencies' data	Develop a report that displays state agencies' data including necessary kinds of information such as conciliated status, the company reported status, etc...	5
REQ-1.40	Improve report UX/UI	Company reports must display the same as the main template for both non-consolidated and non-consolidated companies.	6
REQ-1.41	Develop a module that can input license information one by one manually	Develop an input form to insert license information with the map point inputs.	5
REQ-1.42	Develop exportable reports that are the same as appendices of the reconciliation report	Audit companies should insert data into only E-Reporting. The e-Reporting system will export data for Reconciliation report appendices.	6

2. Activity 2 - API module for exchanging necessary data with government agencies

2.1 General description

API modules for exchanging necessary information with government agencies.

2.2 Functional requirements

Code	Requirement name	Description	Importance
REQ-2.1	Connecting to the single sign-on of ITC	Connect to the single sign-on of ITC https://auth.itc.gov.mn/.	6
REQ-2.2	Develop APIs to exchange necessary data with MRPAM.	Develop APIs to exchange necessary data such as license-related data, geographical data, etc... with MRPAM.	6
REQ-2.3	To send necessary data to Arc.js map for EITI	To send necessary data that is defined by EITI and MRPAM staff to Arc.js map for EITI through the API.	6
REQ-2.4	Connect to the Geographical information system of the Institute of Geology and Ecology	Connect to the Geographical information system of the Institute of Geology and Ecology.	4
REQ-2.5	Connect to the MTA	Connecting to MTA, customers can get data already reported to the MTA.	4
REQ-2.6	Connect to the CGA	Customers can get data already reported to the CGA.	4
REQ-2.7	Connect to the GDSI system	Connecting to the GDSI system, get social insurance and employment information.	4
REQ-2.8	Connect to the MET system	Connecting to the system of the Ministry of Environment and Tourism, get common mineral data into the E-Reporting system.	6
REQ-2.9	Connect to the GASR system	Connecting to the GASR system, get company information and beneficial ownership information.	6

3.   Activity 3 - API module for third-party applications

1. General description

Develop APIs to get all kinds of raw and processed data from E-Reporting. Also, develop APIs to receive EITI report data from customers. **Auto-generating documentation from API specifications. Automatically updating documentation based on changes to source code.**

2. Requirement Categories

Requirements are categorized by code below:

- **Ref**   – To get reference data
- **Info**   – To get an email description of the item
- **List**   – To get list information
- **Uni**   – To get unified and processed data

3. Functional requirements

Following requests are only can be called by the API and return a JSON structured response.

Code	Requirement name	Description	Importance
REQ-3.1	Info. Get company report information	Passing company registration number and year as a parameter, to get detailed information for company reports. Report reference numbers are described in the REQ-3.5 and appendix reference numbers are described in the REQ-3.6. Companies are able to report multiple in one year through the different types of reports.	6
REQ-3.2	Info. Get company detailed information	Passing either company name or registration number as a parameter, and get detailed company information such as an address, type, activity type, beneficial ownership, license info, mineral types of the license, etc...	6
REQ-3.3	Info. Get detailed license information	Passing license number as a parameter, to get license detailed information such as Aimag Soum list, owner info, license history, position info, date info, etc...	6
REQ-3.4	List. Get the list of companies	Passing a year as a parameter, to get the list of companies with name, register number, license info, and license location.	6
REQ-3.5	Ref. Get a reference for the report	Passing a year as a parameter, to get a list of reports with their reference number. If not sent any parameter, the system will send all reports list including state agencies' reports.	6
REQ-3.6	Ref. Get references to report appendices	Passing report ID as a parameter, to get appendices reference numbers.	6

REQ-3.7	List. Get the companies' brief info list by appendix ID	Passing report ID as a parameter, to get appendices list.	6
REQ-3.8	Uni. Get processed data of the appendix	Passing the appendix ID (can be with the year) as a parameter, to get processed data of the appendix for each company.	6
REQ-3.9	List. Get processed data of appendix by year period	Passing appendix ID, the beginning year, and, the ending year as a parameter, to get processed data similar to REQ-3.8 of the appendix in a time period.	4
REQ-3.10	Uni. Get processed data of appendix in a time period	Passing appendix ID, the beginning year, and end year as parameters, to get processed data similar to REQ-3.7.	
REQ-3.11	Ref. Get a reference list of an area	Passing either location ID or Null, to get a reference list of the location.	6
REQ-3.12	List. Get a license list of the selected location	Passing a location ID list as a parameter including at least one location ID, to get the license list.	5
REQ-3.13	List. Get a company list of the selected location	Passing a location ID list as a parameter including at least one location ID, to get the company list.	5
REQ-3.14	List. Get processed data of the appendix for the selected location	Passing a location ID and appendix ID as a parameter, to get processed data similar to REQ-3.8 of the appendix.	5
REQ-3.15	List. Get environmental impact data	Passing a location ID as a parameter, to get environmental impact data such as wells, springs, rare animal habitats, herdsman's pastures, winter, spring, etc...	4
REQ-3.16	List. Get license list	Passing the year as a parameter, to get the license list of the year.	6
REQ-3.17	Ref. Get mineral type list	Get all the mineral types as a list.	6
REQ-3.18	Ref. Get company activity types	Get all the company activity types as a list.	6
REQ-3.19	Ref. Get country list	Get all the countries as a list.	6
REQ-3.20	Ref. Get owner types	Get all the owner types as a list.	6

REQ-3.21	Ref. Get other references	Get other references used in the system as a list.	4
REQ-3.22	Ref. Get reconciliation report appendices list.	Passing a report ID as a parameter, to get all the appendices of the reconciliation report as a list.	6
REQ-3.23	Uni. Get an appendix data of the reconciliation report	Passing an appendix ID and the year of the reconciliation report as a parameter, to get appendix data.	6

4. Activity 4 - The module for exporting available data in an open data format

1. General description

Export all the data collected in the E-Reporting system is exported according to each template form, as well as the data filtered by available filters in an open data format.

2. Functional requirements

The data below is all in list format. Filters are described in the description of each.

Code	Requirement name	Description	Importance
Information of tax and commission paid to the state			
REQ-4.1	Filtered data by the location	Filtered and ordered data by the location such as Aimag, Soum, district, etc…	6
REQ-4.2	Filtered data by the mineral type	Filtered data by the mineral type such as coal, gold, gas, etc...	4
REQ-4.3	Filtered data by license type	Filtered data by license types such as production, and exploration.	3
REQ-4.4	Filtered data by company type	Filtered data by company type and company owner type such as state-owned or not, company activity type, etc...	2
Information of tax and commission paid to the Aimag governor's office			
REQ-4.5	Filtered data by the location	Filtered and ordered data by the location such as Aimag, Soum, district, etc…	5
REQ-4.6	Filtered data by the mineral type	Filtered data by the mineral type such as coal, gold, gas, etc...	5
REQ-4.7	Filtered data by license type	Filtered data by license types such as production, and exploration.	3
REQ-4.8	Filtered data by company type	Filtered data by company type and company owner type such as state-owned or not, company activity type, etc...	4
Extraction, sales and transportation			
REQ-4.9	Extraction size and cost filtered by mineral type	Extraction size and cost filtered by mineral type	6

REQ-4.10	Filtered data by the location	Filtered and ordered data by the location such as Aimag, Soum, district, etc…	4
REQ-4.11	Filtered data by top 30 taxpayers	Filtered data by top 30 taxpayers	1
REQ-4.12	Filtered data by company activity	Filtered data by company activity type	1
Information of production license			
REQ-4.13	Filtered data by mineral type	Filtered data by mineral type ordered by paid tax	4
REQ-4.14	Filtered data by other fields.	Filtered data by other fields such as license status, owner status, granted or revoked date, license count, area size, location info, etc...	5
Information of exploration license			
REQ-4.15	Filtered data by the paid tax to Aimag Governor's office	Filtered data by paid tax to Aimag Governor's office	6
REQ-4.16	Filtered data by other fields.	Filtered data by other fields such as license status, owner status, granted or revoked date, license count, area size, location info, etc...	4
REQ-4.17	Filtered data by area info	Filtered data by area info such as size, location, etc…	6
REQ-4.18	Filtered data by pledge info	Filtered data by pledge info such as pledger name, date, etc…	1
REQ-4.19	Filtered data by beneficial ownership info	Filtered data by beneficial ownership info such as BO country, name, owner percentage, etc...	3
Donation information			
REQ-4.20	Filtered data by the receiver	Filtered data by the receiver such as receiver legal entities type, governor unit, etc...	5
REQ-4.21	Filtered data by other fields	Filtered data by other fields such as donation purpose and governor's unit, payment, etc…	6

Contract information			
REQ-4.24	Filtered data by contract details Гэрээний үнийн дүн, хугацаа, зориулалт	Filtered data by contract details such as contract payment info, contract period, purpose, etc…	
REQ-4.25	Filtered data by contractor info	Filtered data by contractor info such as signer person, governor info, evaluated according to law or not, etc…	
Recovery information			
REQ-4.26	Filtered data by recovery information	Filtered data by recovery information such as subcontracted company, Aimag Soum, area info, recovery type, time period, etc…	4
Other information			
REQ-4.27	Filtered data by workers' info	Filtered data by workers' info such as citizenship, gender, license brief info, etc…	4
REQ-4.28	Filtered data by water usage	Filtered data by water usage such as used water size, type, payment, etc...	4
REQ-4.29	Filtered data by procurement information	Filtered data by procurement information such as procurement type, license location, company type, etc...	5

5. Activity 5 - Research and analysis module

1. General description

Develop a new research and analysis module with the widest range of available filters (dynamic filters) for research institutions, researchers, and others interested in EITI data.

2. Functional requirements

Code	Requirement name	Description	Importance
REQ-5.1	Admin side configuration section for filters of this module	In the admin section, set which part of the appendix to filter. Also, set the Cronjob config to update and calculate the data of Database views. Additionally, filter by date, company, region, license, license type, final owner, mineral type, etc...	6
REQ-5.2	Calculate and update DB views	The Cronjobs collect data set according to REQ-5.1 then calculate and update database views.	6
REQ-5.3	User interface	Display filters configured according to REQ-5.1. Display requested data in the Datatable that is exportable as Excel or CSV.	6
REQ-5.4	Auto-detect unsaved data to the DB views	If the filter combination selected by the customer doesn't exist in the DB views, save the data to the view when the next execution of the cronjob is described in REQ-5.2.	6
REQ-5.5	Perform System analysis design on this module	Determine and analyze additional requirements not mentioned above. Develop the requirements determined.	4

6. Activity 6 - Social friendly infographics module

1. Ерөнхий тодорхойлолт

Develop a new module that can be shared infographics on social media, viewed on mobile phones and tablets, and prepares and displays about 10 types of information and infographics that are of most interest to the public. Have several specific types of filters, such as date and location.

2. Data filters

Customers can filter the required diagrams using the filters below for a more detailed view:

- Filter by geographic location: City, Aimag, Soum, District, Khoroo, (in some cases filter by country), etc...
- Company type and activity
- Mineral type
- License type, product sharing agreement
- Reconciliated or not
- Year (Customers can choose a year cycle instead of a specific year. To view by period, select a start and end date and the totals will be displayed)

3. Functional requirements

The graphs listed below can be filtered using the filters specified in section 3.6.2 and are shareable on social networks.

Code	Required graph name	Description	Importance
REQ-6.1	Tax and commission graph	Компаниудын төлсөн нийт татвар хураамжийн мэдээллийг улсад болон орон нутагт төлсөн байдлаар 3.6.2-т заасан шүүлтүүрүүдээр шүүж, графикаар харуулна.	6
REQ-6.2	License graph	Filter and view all license-related data graphically.	6
REQ-6.3	Beneficial ownership graph	Filter and view all beneficial ownership related data graphically.	6
REQ-6.4	Extraction and procurement graph		5
REQ-6.5	Donation graph		5
REQ-6.6	Contract graph	UX/UI of charts and graphs will be developed in discussion with PIU.	5
REQ-6.7	Recovery graph		5
REQ-6.8	Workers graph		5
REQ-6.9	Water usage graph		5
REQ-6.10	Waste graph		5

7. Activity 7 - Database changes

1. General description

Develop and configure database-based changes and optimization related to the above 6 kinds of development. In particular, it automatically generates Views with precalculated information for reports and infographics.

2. Functional requirements

Code	Requirement name	Description	Importance
REQ-7.1	Data cleaning	Detect and remove unnecessary tables and data from the database.	6
REQ-7.2	Optimize the structure of the database	Standardize naming in one format and optimize relationships of the tables.	6
REQ-7.3	Шинээр хийгдэх ажлуудтай холбоотой өөрчлөлтүүдийг оруулах	Perform the changes related to new development and upgrade.	6
REQ-7.4	Data migration	Perform data migration related to renewed sections.	6
REQ-7.5	Create the necessary views	Create the necessary views for graphs, processed data, and calculations.	6
REQ-7.6	Stored Procedure болон Function-ууд бичих	Develop necessary functions and stored procedures for calculations and data processing.	6
REQ-7.7	Table and query optimizations	Perform table and query optimizations for the entire database	6
REQ-7.8	Perform data analysis	Perform data analysis inserted before. And fix missing or incorrect data.	4

EXTERNAL INTERFACE REQUIREMENTS

User Interfaces

The consultant will perform a Design Sprint involving all stakeholders of the system to develop the most appropriate and user-friendly UX/UI.

Hardware Interfaces

The system is hosted on a cloud server in the National data center. An IP v4 network interface is configured on the server. To use a Unix-based operating system and perform Ethernet interface and Firewall configuration.

Software Interfaces

- Connect with other software applications using standard API protocols.
- Connect with other systems of government organizations within the secure zone of the National data center.

Communications Interfaces

- The system must use the HTTPS protocol on port 443.
- Connect with other systems using standard API protocols to exchange data.
- Email will be sent via AWS SES service and SMTP protocol.
- Only Secure FTP or SSH port will be open on the server.
- Access to ports other than 443 and 22 from the server side must be closed.
- Access the database via SSH Over connection (port 22). Close the direct access.

NONFUNCTIONAL REQUIREMENTS

Performance Requirements

The system shall be capable of processing at least 500 concurrent users and shall use resources not exceeding the specifications listed below:

- Hard disk: 100GB
- RAM: 4GB
- CPU: 2.5GHz

Safety Requirements

- A confirmation popup must be displayed when duplicate and delete action..
- The flash message must be understandable or numbered. If the numbered message is displayed, the numbers must be defined in the documentation in detail.
- Ensure data safety well.
- Avoid data deletion as much as possible.
- Actions performed by admin users of the system must be logged.

Security Requirements

- Use the latest long-term supported version of the web framework with an MVC structure.
- Internet-based attacks on web systems must be prevented. For example Brute force, Credential stuffing, SQL Injection, Cross-site scripting, Cookie poisoning, Session hijacking, etc.

Software Quality Attributes

- Use common coding standards.
- Unit tests and integration tests must be performed.
- The development environment must be separate from the production environment.
- Regularly update the versions of frameworks, libraries, and server software used within the scope of the software warranty and service level agreement.
- Classes, variables, and function names must be understandable. If not, use a coding comment.
- Hard coding and Magic Number are not used. if necessary use hard coding, discuss with PIU and use coding comments.

Other requirements

Appendix B: Bug list

Code	Name	Detail description	Importance level
BUG-1	Fix and update inside of the user guide menu.	For both company and anonymous users.	4
BUG-2	Skip the rows with 0.00 value for Excel Import of the report	When government agencies' users import report data from an Excel template, skip rows with 0.00 or blank values in all columns.	5
BUG-3	Eliminate duplication of reports	Correcting errors that appear when reports are filled out multiple templates in the same year at the same company, and cleaning up the data.	4
BUG-4	To display some not showing reports	Some years company reports not display publicly.	4
BUG-5	Not saving the appendix sometimes	The warning message "To choose location" when the user has already chosen the location sometimes.	5
BUG-6	Remove tax office info from state users	Stop the required field that tax office info from state agencies profile.	5
BUG-7	Download the official letter history	Add a download link of the official letter in each report history.	3
BUG-8	Correct error when Excel import	When importing a report from Excel, displays unknown errors in some cases.	5

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