OQI Impact Tool

Functional Documentation

Contents

1. Introduction

Purpose of the Application

The OQI SDG Tool is a web-based platform developed by the Open Quantum Institute to help users design, map, and evaluate the impact pathways of their projects against the United Nations Sustainable Development Goals (SDGs). It enables individuals or teams to document their theory of change, align it with relevant SDGs, visualize the relationships between results and indicators, identify associated risks and assumptions, and assess cross-SDG interactions using a color-coded interlinkage matrix. The tool supports multi-user collaboration; a project initiator can invite others to work on the same project. All work can be saved, edited, and exported as PDF for reporting or presentation purposes.

Scope of the Application

This document covers all functionalities provided by the OQI SDG Impact Tool, detailing the platform's core modules, frontend workflows, backend API endpoints, and data management features. The application is designed to enable users to:

- Create and manage projects linked to UN Sustainable Development Goals (SDGs).

- Define and manage Impact Indicators using structured tables.
- Map SDGs and SDG Targets to project impact rows.
- Visualize project outcomes through an interactive Theory of Change diagram.
- Analyze interconnections between SDG targets using a color-coded SDG Interlinkage Matrix.
- Document risks, assumptions, stakeholders, and activities for each project.
- Export diagrams, matrices, and project reports in PDF format for collaboration and decision-making.

The document further explains the system's architecture, endpoints, workflows, and security measures, ensuring a clear understanding of how the platform enables data-driven SDG analysis.

Intended Audience

This document is intended for:

- Developers → To understand the system's architecture, API structure, and data flows for ongoing development and maintenance.
- System Administrators → To manage deployments, integrations, and environment configurations of the platform.
- Technical Support Teams → To assist users by understanding core workflows, resolving issues, and troubleshooting data-related problems.
- OQI Researchers, Analysts, and Stakeholders → To gain insights into how the tool manages project data, generates SDG mappings, and visualizes results.

1. User Authentication and Management

The **OQI SDG Impact Tool** currently **uses** JWT-based authentication with predefined user credentials stored in the database. At this stage, new user registration and email verification are not available. Upon deployment, the system will be enhanced to integrate Single Sign-On (SSO) **for authorized** OQI users**.**

1.1 Login

- Users log in using their email and password via the Login Page (/login).
- The frontend sends a request to the backend API: POST /auth/login
- The backend:
  - Verifies the provided credentials against stored user records.
  - Generates a JWT token upon successful authentication.

        - Sends the token back as a secure, HTTP-only cookie to manage the session.
    - After successful authentication, users are redirected to the **Dashboard** to access and manage their projects.

1.2 JWT Token Management

- Token Generation → Implemented using jsonwebtoken in the backend (jwt.ts).
- Token Storage → Sent to the browser as an HTTP-only cookie for enhanced security, preventing direct JavaScript access.
- Token Validation → Each protected API request passes through the requireAuth middleware:
    - Verifies the token's validity.
    - Ensures the request is made by an authenticated user.
- If the token is missing, expired, or invalid, the request is rejected, and the user is redirected to the Login Page.

1.3 Protected Routes

- Access to certain pages and features requires a valid authenticated session. These include:
    - Dashboard (/dashboard)
    - Project Pages (/project/[projectId])
    - Theory of Change Diagram
    - SDG Interlinkage Matrix

  Without a valid session, users attempting to access these areas are automatically redirected to the Login Page.

1.4 Protected Routes

- Upon deployment within CERN/OQI infrastructure, the tool will integrate with OQI's SSO authentication system:
    - Users will log in using their existing OQI credentials instead of manually entering stored credentials.
    - JWT tokens will continue to manage session authentication, but they will be issued following a successful SSO validation.
    - This ensures centralized identity management**,** enhanced security, and seamless integration with OQI's internal systems**.**

2. Project & Impact Management

2.1 Project Creation and Management

- Users can create, view, and manage projects directly from the Dashboard.
- Each project contains essential metadata such as:
    - **Project Title**

        - **Description**
        - **Owner**
        - **Collaborators**
    - Projects are stored in the database and linked to the authenticated user.
    - Once a project is created, users can access its detailed editing page to manage impact data, SDGs, diagrams, matrices, and stakeholders.

3. Impact Framework & Hierarchy Management

Inside each project, users can define **Impact Rows**, which represent different **levels of the Theory of Change**:

- **Long-Term Impacts**
- **Mid-Term Impacts**
- **Short-Term Impacts**
- **Outputs**

For each impact row, users can specify:

- **Score**
- **Result**
- **Indicator**
- **Indicator Definition**
- **Means of Measurement**
- **Baseline**
- **SDG**
- **SDG Target**

The backend ensures all records are properly linked to their respective project and supports full CRUD operations (Create, Read, Update, Delete).

4. SDG and SDG Target Mapping

The application integrates **Sustainable Development Goals (SDGs)** and **SDG Targets** into each project's structure. Users can :

- Select relevant **SDGs** from a predefined list of 17.
- Map multiple **SDG Targets** to each impact row.
- View which targets are associated with each result statement.

These mappings are stored in the database for analysis and visualization.

5. Interactive Theory of Change Diagram

- The platform automatically generates a ReactFlow-based diagram based on the user's impact rows.
- Diagram features:
  - Visualizes the Theory of Change structure.
  - Dynamically positions nodes for long-term, mid-term, short-term, and output blocks.
  - Displays connected Risks, Assumptions, Stakeholders, and Activities.
  - Supports drag-and-drop positioning, live updates, and smooth animations.
  - Allows exporting diagrams as PDF for reporting.

6. SDG Interlinkage Matrix

- The tool includes a fully interactive **SDG Interlinkage Matrix** to analyze how SDG targets influence each other.
- Features:
  - Dynamically generated based on **selected SDG targets** from the project.
  - Allows users to input an **interaction score** ranging from **-3 to +3**:
    - **+3** → Indivisible (strong positive influence)
    - **+2** → Reinforcing
    - **+1** → Enabling
    - **0** → Neutral / Consistent
    - **-1** → Constraining
    - **-2** → Counteracting
    - **-3** → Cancelling
  - Users can provide **rationales** explaining why they selected a particular score.
  - Data is autosaved and stored in the backend.
  - Includes **PDF export** for reports.

7. Risk, Assumption, Activity, and Stakeholder Management

- The tool provides dedicated sections for defining contextual factors influencing a project's outcomes:

- **Risks** → Potential threats affecting result statements.
- **Assumptions** → Hypotheses about external factors.
- **Activities** → Planned actions leading to outputs and outcomes.
- **Stakeholders** → Mapped to hierarchy levels, categorized as **Direct** or **Indirect**.

- These are seamlessly integrated into the diagram for full visualization.

8. PDF Exporting

- Users can export:
  - **Theory of Change diagrams**
  - **SDG Interlinkage matrices**
  - **Impact tables**
- Ensures project insights are easily shareable with OQI stakeholders, researchers, and partners.

9. Security & Authentication

- The platform uses **JWT-based authentication** to secure access to projects.
- Only authenticated users can:
  - Access their dashboards.
  - Edit project details.
  - Update diagrams, matrices, and stakeholder data.
- Future enhancement: **OQI Single Sign-On (SSO)** integration for secure and centralized login.

References:

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