



GenAI Search Solution to Retrieve Insights From Large Datasets

A GenAI Search solution that transforms how a global intergovernmental organization interacts with complex datasets, providing instant, context-aware insights for gender equality and policy decisions, enhanced by a redesigned digital experience.

Overview

- **Intelligent Retrieval:** The system automatically routes natural language queries to the most appropriate engine (text or database) for instant, context-aware results.
- **Decision Acceleration:** Policymakers and analysts can efficiently retrieve insights on funding partners, financial reports, and systemic outcomes, replacing time-consuming manual effort.
- **High Precision & Context:** Leverages Retrieval-Augmented Generation (RAG) to ensure search results are precise and grounded in the organization's domain-specific knowledge base.
- **Experience-Led Access:** Redesigned navigation and contextual layouts helps users quickly grasp insights and impact.



Client

International intergovernmental organization that operates in over 150 countries, working in areas such as poverty, governance, and environment, with a strong focus on gender equality and women's empowerment.

Challenges: Getting the Right Match

- **Ineffective Keyword Search:** The existing keyword-based search frequently returned incomplete or irrelevant results from a vast database spanning poverty, governance, and gender domains.
- **Data Fragmentation and Volume:** Managing large-scale databases containing both structured (financial, KPI) and unstructured (reports, policies) data made precision querying difficult, requiring manual effort.

- **Technical Barrier to Data:** Users lacked the technical expertise needed to execute precise SQL searches, creating bottlenecks and dependency on specialized teams.
- **Fragmented User Experience:** Budgets, activities, and outcomes were spread across multiple pages, forcing users to manually piece together insights.

GenAI-based Search Solution

QBurst developed a multifaceted GenAI search solution for the client's Transparency Portal, enabling information retrieval through natural language queries without requiring technical knowledge of database structures. The system intelligently determines the most accurate and efficient method to process each request. The core of the solution relies on Azure OpenAI for generative capabilities and Retrieval-Augmented Generation (RAG) for contextual accuracy. Alongside the GenAI layer, the Transparency Portal was redesigned with simplified navigation, contextual layouts, and task-focused journeys—enabling users to move seamlessly from question to insight to impact.

Key Solution Phases

- **LLM Router, Text & SQL Engine:** Integration of a sophisticated GenAI system that routes queries to the appropriate processing engine (vector-based similarity search for text analysis or dynamic SQL generation for structured data).
- **SQL Generator:** Development of a natural language to SQL query generator that translates user requests into precise database queries.
- **Context Management (RAG):** Implementation of vector-based similarity search to quickly identify relevant information from the knowledge base, ensuring results are context-aware and grounded in proprietary data.
- **Experience-Led Discovery:** Simplified navigation and context-rich layouts help users find and understand insights faster.

Technical Highlights

- **Intelligent GenAI Query Routing:** Automatically determines the most appropriate processing method (Text-to-SQL or RAG/Similarity Search) for each complex query.
- **Vector Search Implementation:** Utilized vector-based similarity search (pgvector) and tools like LangChain and LlamaIndex to quickly identify relevant information from vast knowledge bases.
- **Multilingual Support:** The NLP pipeline was designed for seamless handling of conversational queries in multiple languages.
- **Enterprise Security:** Integrated with Azure API Management and ensured enterprise-grade security for sensitive data throughout the processing pipeline.
- **Streamlined Navigation:** Country and program discovery redesigned into simple, task-focused flows.

Impact: Optimal Search Results with GenAI

The GenAI search solution delivered significant, measurable gains in speed and efficiency for policy analysis:

- **Accelerated Information Access:** Reduced the time required to retrieve complex, cross-domain information by 60%.
- **Multilingual Inclusivity:** Significantly improved access for non-English speaking team members, leading to a 45% increase in cross-organizational knowledge sharing.
- **Design-Led Clarity:** Context-rich layouts reduced cognitive load and context switching, while a modular design system enabled 40% faster, consistent content updates.
- **Improved Donor Reporting:** Ensured accurate and timely updates for stakeholders, reducing manual data validation time for reports by 50%.

- **Enhanced Decision Support:** Improved data accessibility and streamlined complex queries, enabling evidence-based decision-making.
- **Future-Ready Scalability:** Established a secure and scalable foundation that complies with data security regulations and is ready for future innovations like predictive insights.