



GeoBusiness Intelligence Studio

Official Repository Guidebook

An Open-Data Platform for Business Discovery, Mapping, Data Quality, and Optional BYOK AI





What This Repository Delivers

A practical open-data intelligence workspace
for discovering and analyzing local businesses

OVERVIEW

GeoBusiness Intelligence Studio is an open-data platform that helps you discover, prepare, map, compare, and export business data with confidence.

Open data in Out.

Privacy aware.

Quality first.

Reproducible.

WHY IT MATTERS



Analysts

Make data-driven decisions with trusted local data.



Researchers

Study places, patterns, and local economies.



Founders

Validate markets and find new opportunities.



Consultants

Deliver sharper insights for clients and projects.



Students

Learn and build real projects with open business data.



Local-Market Investigators

Understand any area in detail.

CORE CAPABILITIES



Search Businesses

Query by what, where, and how broad.



Normalize Records

Standardize names, addresses, phones, and categories.



Geocode Places

Convert addresses to accurate map coordinates.



Map Results

Visualize businesses with clusters and layers.



Remove Probable Duplicates

Detect and merge likely duplicates with smart rules.



Score Data Quality

Assess completeness, consistency, and reliability.



Analyze Patterns

Explore trends by category, area, and attributes.



Export CSV / JSON

Download clean datasets for further analysis.



Optional AI-Assisted Insights

Generate summaries, themes, and opportunities using BYOK AI (optional).

TYPICAL USE CASES



Market Scouting

Find promising areas and underserved categories.



Competitor Mapping

See who's where and how the market is distributed.



Franchise Expansion

Evaluate locations and benchmark trade areas.



Neighborhood Research

Understand local economies and business mix.



Local Service Discovery

Find services near you for any need or topic.



Educational Demos

Teach, learn, and build data projects with real data.

WHAT MAKES IT DIFFERENT



Browser-Ready Interface

Works anywhere, no install needed.



Optional Windows EXE

One-click app for offline convenience.



Open-Data-First Workflow

Transparent sources, ethical by design.



Optional Official Google Places

Higher coverage when you choose.



Responsible OSM Access

Respectful usage, policy-aligned.



Reproducible Repository

Versioned, auditable, and transparent.



Zenodo DOI

Citable, stable, and shareable.

THE WORKFLOW AT A GLANCE



1 INPUT

Choose sources and settings.



2 SEARCH

Run queries to find businesses.



3 CLEAN

Normalize, dedupe, and quality check.



4 MAP

Geocode and visualize results.



5 ANALYZE

Explore patterns and insights.



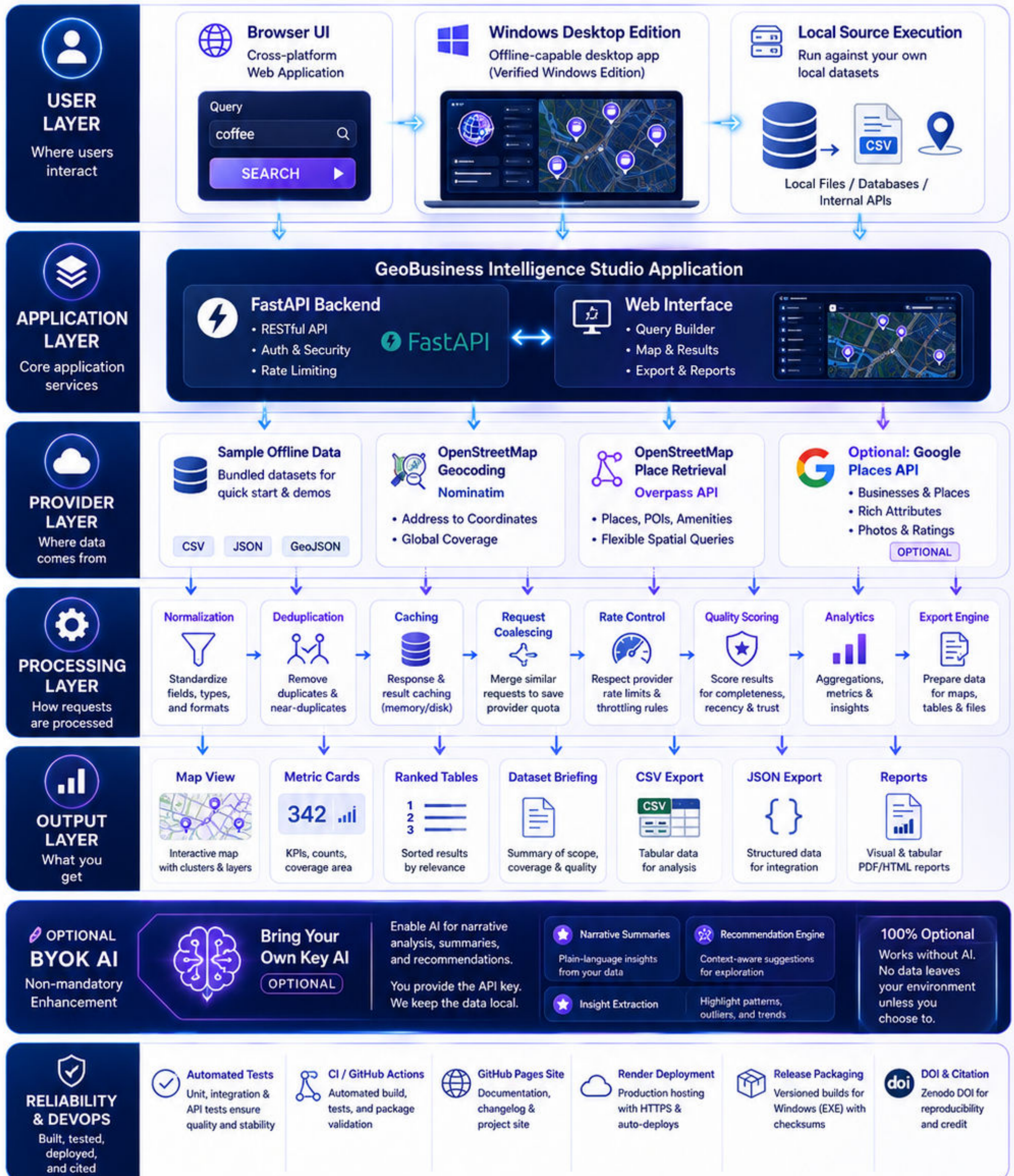
6 EXPORT

Download CSV/JSON and use your data.



System Architecture

How GeoBusiness Intelligence Studio
turns queries into structured spatial intelligence





Responsible OpenStreetMap Access

Built with community-service protection, conservative defaults,
and respectful public-data usage



This is **NOT** a scraper kit for abusive harvesting.

GeoBusiness Intelligence Studio includes safeguards and conservative defaults to protect OpenStreetMap community services. Use it responsibly. The community relies on your respect.



Two public OSM service roles



Nominatim

Geocoding Service

- ✓ Address → Location
- ✓ Search places & addresses
- ✓ Used for geocoding & autocomplete

Endpoint: `/nominatim/search`

Your App



Geocode / Search

Query Places



Overpass API

Data Query Service

- ✓ Query OSM data by area
- ✓ Powerful read-only queries
- ✓ Used for place discovery & data extraction

Endpoint: `/overpass/api/interpreter`

Built-in Safeguards & Ethical Defaults

Rate Limits



Per-service and global rate limits prevent overloading shared infrastructure.

Request Coalescing



Identical concurrent requests are merged to reduce duplicate load.

Caching



Short-TTL caching reduces repeat hits and speeds up responses.

Conservative Public Caps



Default caps per query, area, and result size protect public services.

Timeout Controls



Strict timeouts avoid long-running requests that tie up public resources.

Stale Cache Support



If services are busy, use stale cache responses when available.

Configurable Endpoints



Easily switch between public, mirror, or private endpoints via configuration.



Safe by default. Tunable for your use case. Always respectful of the community.

DO



Use for research, learning, and responsible projects.



Build demos, prototypes, and internal tools.



Make moderate discovery queries within limits.



Be a good citizen.
Respect shared infrastructure.

DO NOT



Overload community services with high-frequency requests.



Bypass protections or remove rate limits and safeguards.



Run aggressive bulk collection or large-area harvesting.



Need high-volume or production workloads?

Use dedicated or paid infrastructure, your own OSM mirror, or the **optional official provider** for scalable, reliable, policy-compliant access.

Compliance-friendly by design

All key behaviors are transparent and configurable via environment variables.

`GBIS_OSM_RATE_LIMIT = 2.0`

Document your settings and share responsibly. Transparency builds trust.



Why this matters

OpenStreetMap is powered by volunteers and shared infrastructure. By using conservative defaults and respectful practices, we protect access for everyone—today and tomorrow—while keeping this project educational, ethical, and useful for the global community.



Browser-ready



Windows EXE



FastAPI



OpenStreetMap



Optional Google Places API



Optional BYOK AI



Exportable CSV/JSON



GitHub Pages



Zenodo DOI



How the Project Was Built

From idea to reproducible software product

A practical, open, and reproducible intelligence platform for local business discovery.
Built in the open. Documented end to end. Designed to be reused.

- 1 Define the problem**
 Practical local-business intelligence without forcing paid AI. ✓ Done
- 2 Design the data model and search workflow**
 Modeled entities, relationships, and filters. Mapped a fast, geo-aware search flow. ✓ Done
- 3 Build the FastAPI backend and provider adapters**
 Core API, OpenStreetMap integration, optional Google Places adapter. ✓ Done
- 4 Create the browser interface**
 Maps, search forms, metric cards, and dataset briefings for clarity. ✓ Done
- 5 Add normalization, deduplication, and export features**
 Clean, consistent datasets. CSV/JSON exports for downstream use. ✓ Done
- 6 Add tests, linting, and CI**
 Automated checks, code quality, and continuous integration. ✓ Done
- 7 Publish GitHub Pages documentation and guidebook**
 API docs, user guide, and this 10-page repository guidebook. ✓ Done
- 8 Deploy the live browser app on Render**
 Production-grade hosting with an always-on public endpoint. ✓ Done
- 9 Package a downloadable Windows edition**
 One-click setup with all dependencies included for offline use. ✓ Done
- 10 Register a DOI and prepare citation metadata**
 Zenodo DOI, metadata, and citation ready for open science. 🔄 In Progress



What We Built

- Open-Data Ingestion**
OSM + Optional Places API
- Fast, Geo-Aware Search**
Filters, radius, and categories
- Insightful Dashboards**
Metrics, ranking, coverage maps
- Clean, Exportable Data**
CSV and JSON formats
- Documented & Reproducible**
Docs, guidebook, and DOI

Project Progress



Engineering Principles

- Modular Design**
Loosely coupled components for easy extension and reuse.
- Readable Code**
Clear structure, naming, and comments that explain intent.
- Reproducibility**
Open data, deterministic steps, and documented workflows.
- Portability**
Runs in the browser and on Windows. Cloud or offline.
- Documentation**
Docs, API references, and a step-by-step guidebook.
- Versioned Releases**
GitHub tags and changelog for traceability.
- User-First Packaging**
Simple setup, sensible defaults, and helpful outputs.

Practical Workflow Example

From a simple query to a usable business-intelligence dataset

EXAMPLE QUERY

Provider
OpenStreetMap

Business type
coffee



City
Amsterdam



Radius
5 km



1 Enter Query

You provide a natural query with business type, location, and radius.



2 Geocode City

The city is geocoded to latitude/longitude to define the search center.

Amsterdam
52.3676° N, 4.9041° E
Search radius: 5 km



3 Fetch Nearby Places

OpenStreetMap is queried for places matching "coffee" within the 5 km radius.



4 Normalize Fields

Data is standardized to a consistent schema (names, address, contact, geometry, source tags).



5 Remove Probable Duplicates

Records with same name & location are deduplicated using smart rules.

Duplicates removed

0

(none detected)



6 Map Records

Results are plotted on an interactive map for spatial validation.



7 Review Quality Metrics

Assess data completeness and overall quality.



8 Export or Continue Analysis

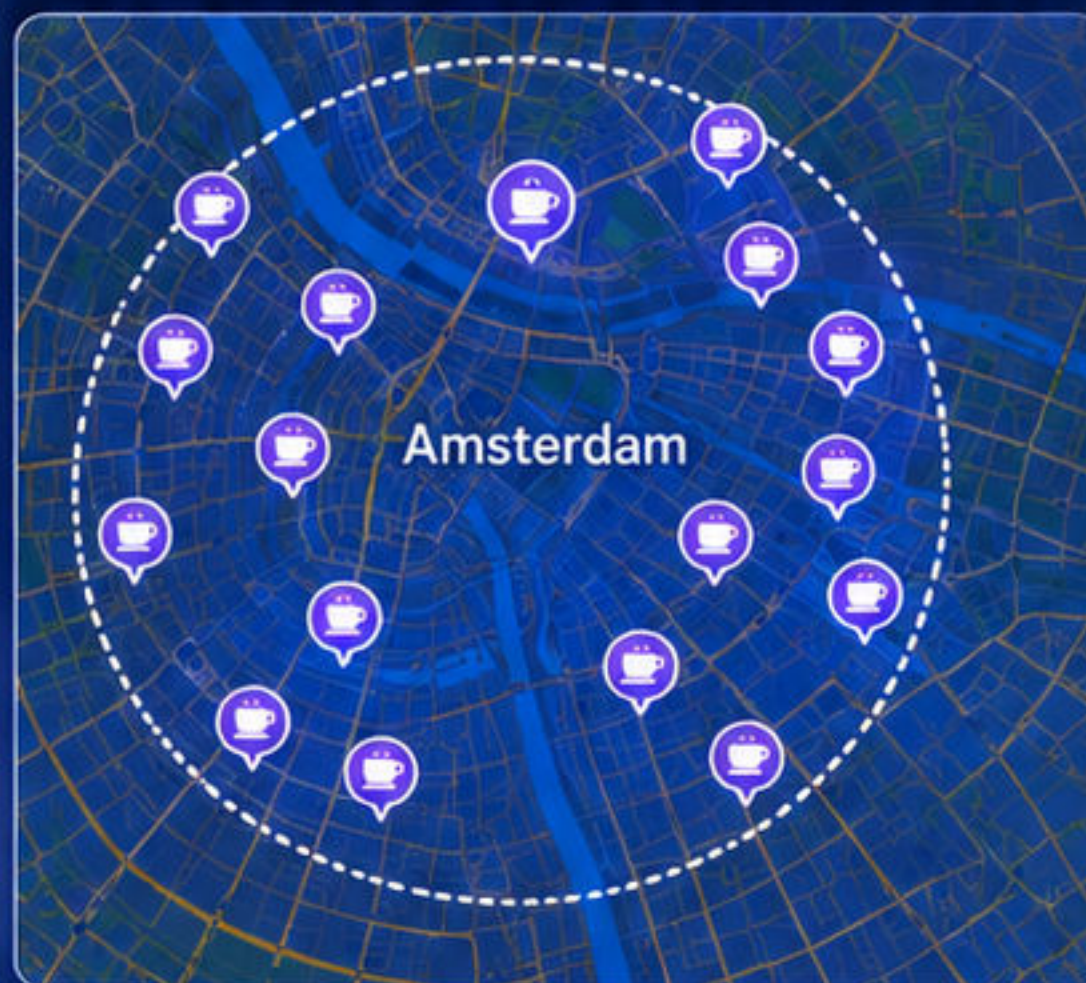
Download the dataset or continue with deeper analysis and enrichment.



SAMPLE RESULT PREVIEW (5 of 29)

	name	addr:street	addr:city	phone	website	source	quality
	White Label Coffee	Westerstraat 106	Amsterdam	+31 20 123 4567	whitelabelcoffee.nl	OSM	82
	LOT Sixty One	Kinkerstraat 112	Amsterdam	+31 20 612 5503	lotsixtyone.com	OSM	76
	Scandinavian Embassy	De Pijp 7	Amsterdam	—	scandinavianembassy.nl	OSM	68
	Bocca Coffee	Ceintuurbaan 282	Amsterdam	+31 20 673 0981	boccacoffee.nl	OSM	71
	Coffee District	Jordan 12	Amsterdam	+31 20 331 4455	coffeedistrict.nl	OSM	73

MAP VIEW — COFFEE SHOPS IN AMSTERDAM (5 KM RADIUS)



Total Records

~29



With Phone

31%

(9 / 29)



With Website

55%

(16 / 29)



Average Quality Score

69 / 100



QUALITY SCORE GUIDE



QUALITY FACTORS

- ✓ Has name & address
- ✓ Has contact (phone or website)
- ✓ Location precision
- ✓ Source reliability (OpenStreetMap)

WHAT THIS DATASET REVEALS



- Strong coverage of coffee spots in central Amsterdam with good name & address quality.
- Phone availability is moderate (31%) — opportunity for enrichment via web or external sources.
- 55% have websites, indicating a healthy presence of established businesses.
- Average quality score of 69 suggests reliable data ready for analysis and decision-making.

OPPORTUNITIES

- ✓ Enrich missing phones via website scraping.
- ✓ Validate & improve location precision for outliers.
- ✓ Segment by neighborhood to find densest coffee clusters.



Browser-ready



Windows EXE



FastAPI



OpenStreetMap



Optional Google Places API



Optional BYOK AI



Exportable CSV/JSON



GitHub Pages



Zenodo DOI



Data Quality, Deduplication, and Exports

Turning messy public records into cleaner, more usable outputs

1 Normalization: Consistent, Comparable, Ready to Use

We standardize and structure public records so every field has a place and a purpose.

Name	Blue Bottle Coffee
Category	Coffee Shop
Address	17 West St, Amsterdam, 1012 BN
Latitude	52.3740
Longitude	4.8897
Phone	+31 20 123 4567
Website	https://bluebottlecoffee.com
Source	OpenStreetMap
Quality Score	92 / 100

2 Deduplication: Find & Merge Probable Duplicates

We detect records that refer to the same real-world place and consolidate them into a single, trusted record.

BEFORE: Duplicate Records			
Blue Bottle Coffee	+31 20 123 4567	bluebottle.com	64
Bluebottle Coffee	+31201234567	bluebottlecoffee.com	71
Blue Bottle Café	+31 20 1234567	bluebottle.com	68
↓			
AFTER: Consolidated Record			
Blue Bottle Coffee	+31 20 123 4567	https://bluebottlecoffee.com	92

✓ Matched by name similarity, address proximity, phone, website, and category.

WHY IT MATTERS

- Avoids inflated counts
- Improves mapping accuracy
- Stronger analytics & insights
- Saves time and manual cleanup

3 Data Quality: Measured, Transparent, Actionable

Every record is scored so you know what you can trust.

COMPLETENESS INDICATORS



Overall Quality

	Status
Name	✓ Present
Category	✓ Present
Address	✓ Present
Latitude	✓ Present
Longitude	✓ Present
Phone	✗ Missing
Website	✓ Present
Source	✓ Present

SCORING LOGIC (Example)

Name present	+20
Category present	+10
Address present	+20
Latitude & Longitude present	+20
Phone present	+10
Website present	+10
Source identified	+5
Recent source (≤ 12 months)	+5
Critical fields missing (e.g., no name or no address)	-20

4 Human review still matters

Automation is powerful—but not perfect.

- Limits:** Ambiguous names, old or conflicting sources, and incomplete data can lead to uncertainty.
- Review:** Flagged records, low scores, and boundary cases are queued for human checks.
- Best practice:** Use quality scores and context to guide decisions—not as the only decision.

5 Exports: Clean Data, Your Way

Export what you need, in the format you prefer.

EXPORT FORMATS



Comma-separated values for spreadsheets, databases, and tools.



Structured, nested data for apps, APIs, and custom workflows.

DOWNSTREAM ANALYSIS

- Enrich & integrate with your datasets
- Spatial analysis & mapping
- Trend analysis & insights
- Machine learning & modeling
- Dashboards & visualization

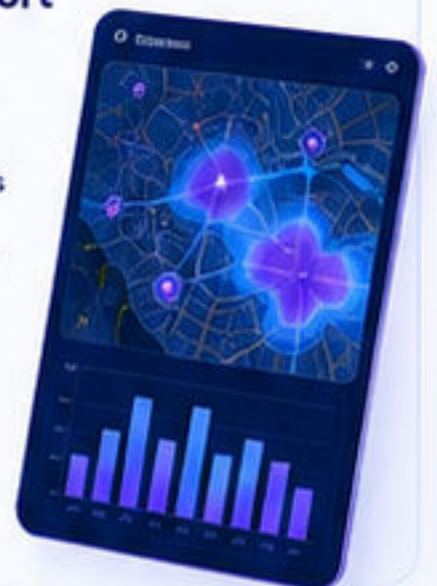
REPORTING & USE CASES

- Market & location research
- Site selection & expansion
- Competitive benchmarking
- Public reporting & transparency
- Policy & planning support

6 Decision support

Cleaner data leads to better decisions.

- More accurate comparisons
- Reliable maps & heatmaps
- Confident prioritization
- Stronger evidence for follow-up research
- Better outcomes—faster



From raw public records to reliable insights.

Normalized. Deduplicated. Scored. Exported. Ready for action.



Higher Quality



Greater Confidence



Faster Decisions



Better Outcomes



Browser-ready



Windows EXE



FastAPI



OpenStreetMap



Optional Google Places API



Optional BYOK AI



Exportable CSV/JSON



GitHub Pages



Zenodo DOI



Deployment & Access Options

Use it in the browser, run it locally, or download the Windows edition

1 Live browser application on Render



- Always up to date
- No install, instant access
- Secure, scalable hosting

[Live on Render](#)

2 Project documentation & landing page on GitHub Pages



- Full documentation
- Usage, setup & guides
- Always available

[View on GitHub Pages](#)

3 Source-code execution for developers



- Run locally
- Full control & customization
- Ideal for development

[Run from Source](#)

4 Downloadable Windows edition for end users



- One-click installer
- No coding required
- Works offline

[Download for Windows](#)

5 GitHub Releases as the distribution hub



- Versioned releases
- Checksums & assets
- Trusted distribution

[View Releases](#)

★ CHOOSE WHAT WORKS BEST FOR YOU

Browser Mode (Render)

- Zero install
- Quick access from anywhere
- Always up to date
- Collaborative & shareable

Best for exploring, sharing, and quick insights.

VS

Windows Edition

- Easy local use
- No coding required
- Works offline
- Great performance on Windows

Best for end users who want a ready-to-use desktop app.

VS

Source Mode (Developers)

- Full access to the codebase
- Customize features & logic
- Integrate with other tools
- Best for experimentation

Best for developers who want flexibility and control.



DEPLOYMENT PIPELINE

From code to users, automatically.



POWERED BY MODERN, TRUSTED TECHNOLOGIES



FastAPI

High-performance Python API



GitHub Actions

CI/CD automation and workflows



GitHub Pages

Documentation & landing page



Render

Cloud hosting for web applications



PyInstaller

Windows packaging & bundling



Zenodo DOI

Citable releases & dataset access



Open Source



Reproducible



Transparent



Secure



Citable (Zenodo DOI)



Community Driven



Reproducibility, Citation, and Research Value

Why this repository is more than a demo



DOI
10.5281/zenodo.
21539094



Repository URL
[github.com/
FaramarzKowsari/
geo-business-
intelligence-studio](https://github.com/FaramarzKowsari/geo-business-intelligence-studio)



Project site
[faramarzKowsari.github.io/
geo-business-
intelligence-studio/](https://faramarzKowsari.github.io/geo-business-intelligence-studio/)



Guidebook site
[/guidebook/](#)
v1.0.0



Why cite software

- ✓ Gives proper credit to creators and contributors
- ✓ Enables transparent, reproducible research
- ✓ Supports reuse, extension, and validation
- ✓ Creates a persistent, citable scholarly record
- ✓ Helps the community discover and trust your work



Reproducibility assets

	README.md	Overview, quick start, system requirements, and usage
	RELEASES	Versioned releases with changelog and assets
	CITATION.cff	Standardized citation metadata (machine- and human-readable)
	Guidebook (this series)	10-page guidebook with examples and explanations
	Tests	Automated tests for reliability and regression checks
	Workflow automation	CI workflows for linting, testing, and release integrity
	Documented deployment	Clear steps to run locally and deploy in the cloud



Who can use it

	Educators	Teach spatial analytics, dashboards, and data workflows with real-world context.
	Researchers	Build on methods, validate results, and compare across places and time.
	Analysts	Answer business and policy questions using reproducible, explainable insights.
	Applied AI Practitioners	Extend the platform, integrate models, and operationalize geospatial AI.



Suggested outputs

	Teaching demos	Classroom-ready notebooks, dashboards, and interactive maps.
	Local-market studies	Coffee shops, retail, tourism, real estate, and service accessibility analyses.
	Spatial comparisons	Neighborhoods, districts, cities, or regions across countries.
	Method showcases	From data prep to modeling, evaluation, and communication.



This is a citable software repository with an associated Zenodo record.

Please cite the software using the DOI below and credit the authors. Doing so helps strengthen open, reproducible, and impactful research.

Cite this project

DOI **10.5281/zenodo.21539094**

Kowsari, F. (2024). GeoBusiness Intelligence Studio: An Open-Data Platform for Business Discovery, Mapping, Data Quality, and Optional BYOK AI [Software]. Zenodo. <https://doi.org/10.5281/zenodo.21539094>



Versioned releases

Track changes, access stable versions, and reproduce results.

v1.0.0

Latest stable
May 2024

v0.9.0

Beta
Mar 2024

v0.8.0

Alpha
Jan 2024

See all releases
on GitHub →



Browser-ready



Windows EXE



FastAPI



OpenStreetMap



Optional Google Places API



Optional BYOK AI



Exportable CSV/JSON



GitHub Pages



Zenodo DOI

About the Author

Faramarz Kowsari

Faramarz Kowsari is an author, Software Engineer and AI researcher based in Istanbul. Focusing on the intersection of technology, education, and personal growth, he has published over 80 digital titles on international platforms. His areas of expertise span Artificial Intelligence, prompt engineering, modern trading strategies (Smart Money Concepts & algorithmic trading), as well as classical literature and mindfulness. In addition to writing, he develops web-based educational tools and creates specialized instructional video content.



GeoBusiness Intelligence Studio

Open Data. Smart Tools. Better Decisions.



Browser Access

Launch instantly. Explore spatial data, run analytics, and create insights in your browser.



Windows Edition

Download the verified Windows edition for power users and offline productivity.



Rich Documentation

Step-by-step guides, tutorials, and reference materials for every level.



Responsible Open-Data Use

Built on ethical open data practices with transparency and attribution.



Reproducible & Citable Repository

Open-source code and data with a DOI for research, teaching, and collaboration.



DOI: 10.5281/zenodo.21539094

OFFICIAL PROFILES



ORCID

<https://orcid.org/0000-0003-1692-0453>



Google Scholar

<https://scholar.google.com/citations?user=G7tP5WMAAAAJ&hl=en>



GitHub

<https://github.com/FaramarzKowsari>



LinkedIn

<https://www.linkedin.com/in/faramarzkowsari>



Google Books

https://play.google.com/store/search?q=Faramarz_Kowsari&c=books



Official Website

FaramarzKowsari.github.io



Zenodo Records

<https://zenodo.org/search?q=creators.orcid%3A%220000-0003-1692-0453%22&l=list&p=1&s=10&sort=bestmatch>



Open Data. Smart Tools. Better Decisions.

A transparent ecosystem for business discovery, spatial intelligence, and academic excellence.



Open



Reliable



Collaborative



Educational



Impactful