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EXECUTIVE SUMMARY

ZeroTrace

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INTRODUCTION

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ZeroTrace is a privacy-first platform where individuals with disabilities anonymously request help from verified helpers. We built a secure, GDPR-compliant PostgreSQL database ensures safe and scalable support.

Mission

Empower individuals with disabilities to receive anonymous, stigma-free support through a secure, user-friendly platform

Vision

Become the benchmark for trusted digital support systems—providing anonymous, accessible, and legally compliant assistance

The Product

ZeroTrace is a secure platform enabling individuals with disabilities to request anonymous, stigma-free support from verified helpers.

The Leadership

Led by a multidisciplinary team consist of 3 people , including Kanan Akparov, Matilda, Faiz

The Overall Industry

Operates within digital social care, focusing on accessibility, privacy, and compliance with data protection laws.

The Competitors

Similar platforms include **7cups** and **Be My Eyes**, but **ZeroTrace** stands out by combining full anonymity with accessibility.

The Financial Status

Currently in a pilot phase. Not-for-profit and socially driven.

Future Plans

Expansion with **API** integrations, **AI-based helper matching**, and partnerships with **NGOs** and **health services**.

Project Summary

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ZeroTrace was developed to help individuals with disabilities ask for help anonymously and receive support from verified helpers, reducing stigma and hesitation.

Core Highlights:

- 1) **A fully anonymous request-and-response system**
- 2) **Verified roles to ensure trust between helpers and users**
- 3) **An accessibility-first design, tailored for ease of use**
- 4) **Strong privacy standards and secure data handling**

To support these goals, we designed the database with flexibility, data integrity, and confidentiality in mind, using ER diagrams to ensure clear communication with stakeholders.

Overview of Database Design

1 Entities and Relationships

The relational database consists of the following primary entities:

Entity	Description
Users	ID, demographics, user role
Disabilities	Linked to users; supports specific classification
Disability Categories	Tiered grouping of disability types
Helpers	Subset of users with verification/credentials
Assistance Requests	Timestamps, urgency, and status of help requests
Responses	Links helpers to assistance requests

2 Normalization and Modular Expansion

The database schema was normalized up to the Third Normal Form (3NF) to minimize redundancy and ensure data consistency. The design also accommodates future modular expansions, such as integrations with healthcare systems or disability registries. This modularity improves interoperability and lays the foundation for scalable, long-term system growth.

3 Strengths and Weaknesses

Strengths	Weaknesses
<ul style="list-style-type: none">Clear normalization minimizes data duplication.ER design supports modular growth.PostgreSQL supports ENUMs and UUIDs, enhancing data structure and uniqueness.	<ul style="list-style-type: none">Rigid schema may limit flexibility in capturing unstructured data (e.g., open-text feedback).Additional user metadata may require new tables or migrations.

DBMS Evaluation: SQL vs. NoSQL

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Our team selected PostgreSQL as the DBMS for ZeroTrace based on the following justifications:

- **SQL Compliance & Standardization:** Widely adopted and well-supported for relational use cases.
- **Advanced Data Types:** Support for UUIDs, ENUMs, and timestamps.
- **Security & Role Management:** Critical for GDPR compliance and user-level access.
- **Scalability:** Can support medium to large-scale applications through horizontal scaling.

NoSQL Consideration

While PostgreSQL is ideal for structured data, future enhancements could consider NoSQL for:

- **Storing unstructured logs, feedback, or behavioral tracking.**
- **Improving speed and flexibility in semi-structured modules.**

Legal and Compliance Standards: GDPR Focus

Data Minimization: Only essential user data is collected.

Access Controls: Role-based access for helpers, administrators, and requesters.

Right to Erasure: User data can be anonymized or deleted upon request.

Data Encryption: all transmissions are SSL-protected.

THE GDPR

*Practical Steps to Manage the
EU General Data Protection Regulation*



Results and Recommendations

6.1 Results

1

Successfully built a scalable, normalized database supporting anonymous communication.

2

Achieved high data quality through in-database cleaning scripts.

3

Maintained GDPR compliance using secure identifiers and controlled data flow.

6.2 Recommendations

Recommendation	Priority
Maintain PostgreSQL for structured data but begin prototyping NoSQL modules for unstructured extensions.	High
Implement automated backups and failover strategies using tools like PgBouncer and Prometheus.	High
Develop REST API endpoints for third-party integration (e.g., healthcare systems).	Medium
Introduce AI-based auto-matching for helper-requester connections.	Medium

The ZeroTrace project demonstrates the impact of well-designed digital platforms in social care. The database supports secure, anonymous interactions between users and verified helpers, overcoming the stigma often associated with requesting help. PostgreSQL, with its rich features and robust community, provides the ideal backbone for such a platform.

Our focus on compliance, privacy, and expandability ensures ZeroTrace is prepared for future growth and integration, aligned with the evolving needs of the DOST RIM ecosystem.