



HELPSEEKER  
TECHNOLOGIES

# Data Harmonization for Systems Change: Utilizing Ontologies for Cross-Sector Impact

June 13, 2024

# Land Acknowledgement

We are a settler organization working with Indigenous communities and people in Canada. We strive to be allies in challenging colonial systems and supporting self-determination and sovereignty.

We are committed to aligning with the United Nations Declaration on the Rights of Indigenous Peoples and the Calls to Action of the Truth and Reconciliation Commission.

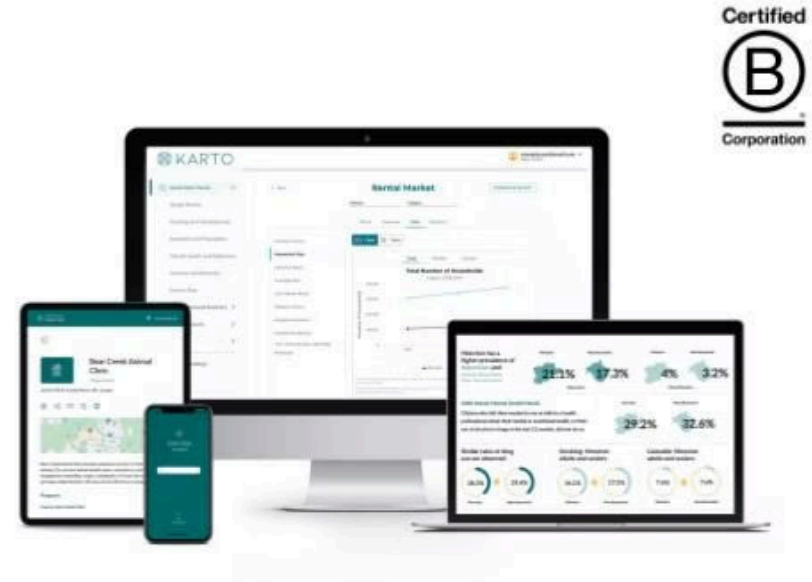
▼ Original art by c/o Dene Artist Michael Fatt - used with permission.

*If you're interested in purchasing art from Michael pls email me **alina@helpseeker.org** and I will connect you with him*



# About HelpSeeker Technologies

Canadian social enterprise pioneering advanced data technology solutions for complex social issues



## OUR MISSION

To build the technological foundation of tomorrow's social safety net.



NAVIGI

Connecting help  
seekers to supports



MARETO

Coordinating service  
providers



KARTO

Data-driven decision  
making



# The Ecosystem of Change

## Interconnected Entities

A holistic view of clients, programs, and organizations is crucial for driving change.

## Holistic Approach

A comprehensive view of the ecosystem for targeted interventions and maximum impact.

# Understanding Ontologies

## 1 ▼ Definition

An ontology is a formal representation of knowledge within a domain, providing a common vocabulary and specifying meaning and relationships.

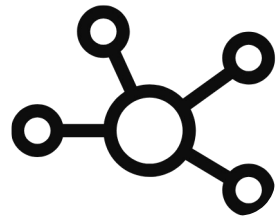
## 2 ▼ Purpose

Ontologies facilitate effective communication and data integration by establishing a shared understanding of concepts, properties, and relationships within a specific domain.

## 3 ▼ Key Aspects

Ontologies consist of classes, properties, relationships, instances, and axioms, enabling the representation of complex knowledge structures.

# Ontology vs. Taxonomy



## ▼ Ontology

An ontology, on the other hand, represents rich semantic relationships, properties, and axioms for comprehensive knowledge representation. It offers greater flexibility and expressiveness compared to a taxonomy.

**e.g. Compass Ontology**

## ▼ Taxonomy

A taxonomy is a hierarchical classification based on common characteristics, providing a simple structure for organizing information.

**e.g. AIRS Taxonomy**

# Building an Advanced Data Ontology

1

## Identify Key Concepts

Pinpoint core entities and concepts in the social impact domain.

2

## Define Classes

Create classes like "Client," "Service," "Program," and "Outcome" to represent the domain.

3

## Establish Relationships

Connect classes semantically, like "Client" participates in "Service," to model the domain.

# Data Alignment Across Sectors

1

## Holistic View

Data alignment enables effective collaboration and decision-making.

2

## Ontology Mapping

Ontologies integrate data across organizations and sectors.

3

## Cross-Sector Initiatives

Ontologies power effective communication and collaboration.

# Key Concepts

## Class and Subclass



### ▼ Class

A broad category that defines a type of entity in the system.

Example: Person



### ▼ Subclass

A more specific category within a class that inherits attributes from the class.

Example: Program Participant is a subclass of Person.

## Properties



### ▼ Properties

These are relationships or associations between different classes or subclasses.

Example: Funded By is a property that links the Program class to the Funder class.

## Fields and Attributes



### ▼ Attributes

*aka Characteristics*

Values assigned to fields for a particular instance of a class.

Example: For an individual participant in the program, the attributes might be:

First Name: Jane

Last Name: Doe



### ▼ Fields

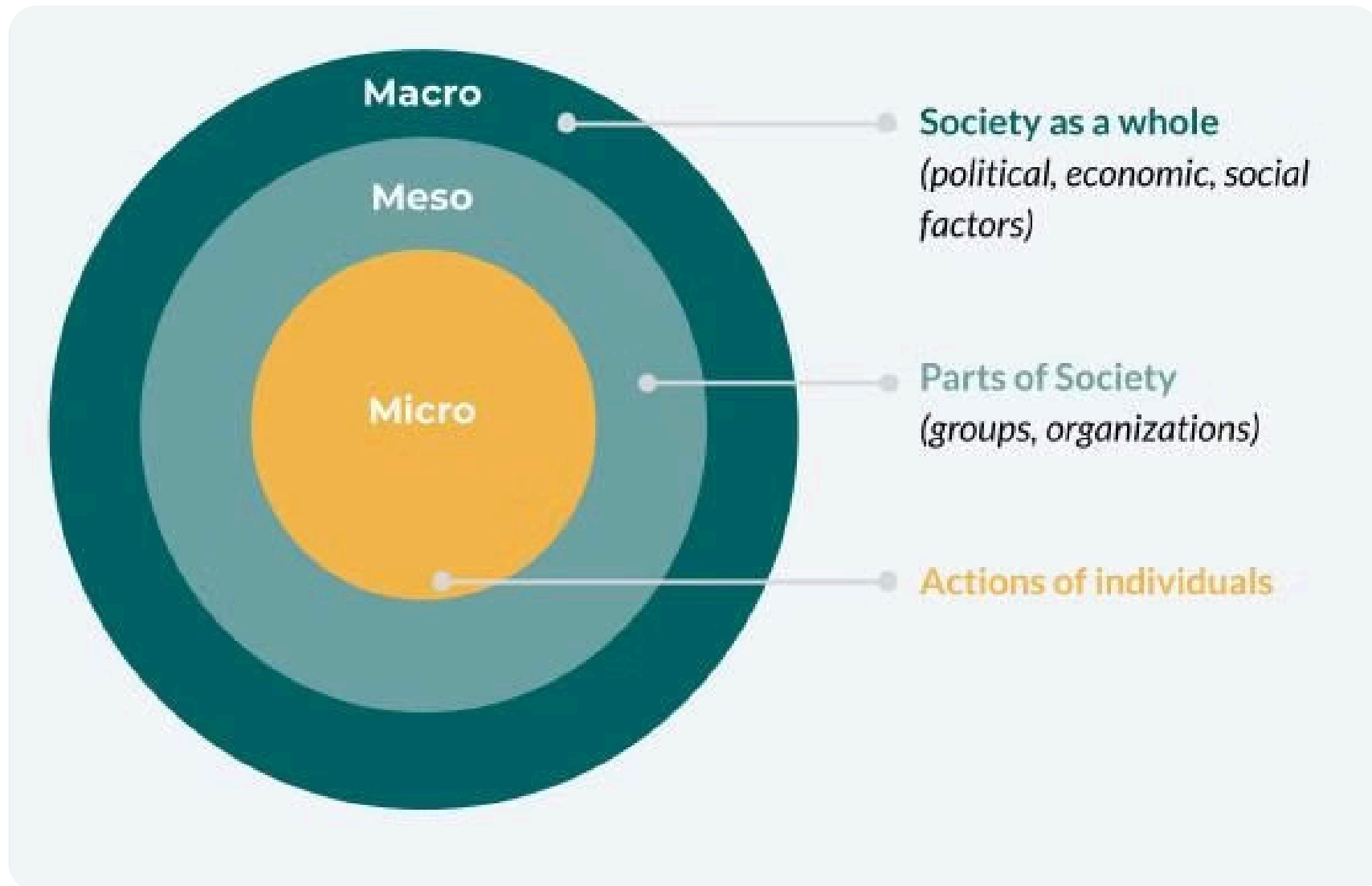
Specific pieces of data associated with a class or subclass.

In data modeling, "attributes" are the abstract properties of entities which, when implemented, become fields in a database table.

Example: For the Person class, fields include First Name, Last Name, Date of Birth, etc.

# Assessing Impact

How do we measure whether we're making a positive impact?



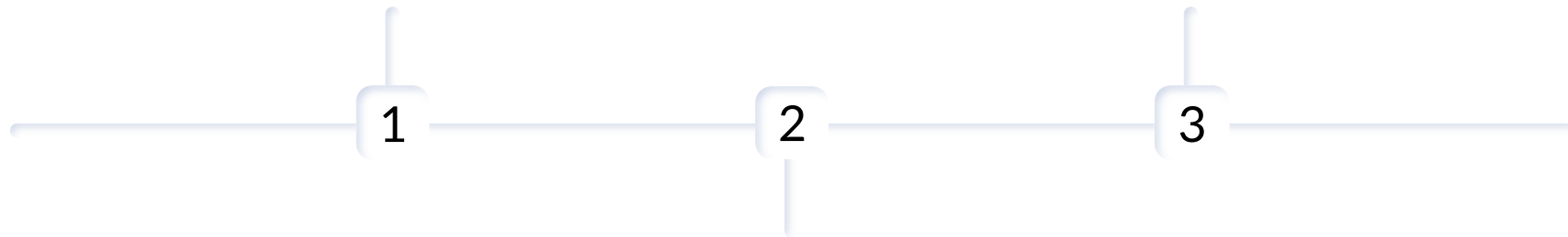
# Lifecycle of Data with Intent

## Data Collection

Collect data aligned with the ontology structure to ensure relevance and consistency.

## Reporting and Visualization

Leverage the ontology's structure to report and visualize data, communicating insights effectively.



## Data Aggregation

Analyze data using ontological relationships to uncover insights and patterns across datasets.

# Engagement and Feedback Mechanisms



## Stakeholder Involvement

Engage stakeholders in ontology development to align with real-world needs.



## Feedback Loops

Update the ontology based on real-world insights to ensure ongoing relevance.



## Meaningful Discussions

Use the ontology to facilitate informed decision-making across stakeholders.

# Impact Analysis and Reporting



## Impact Measurement

Measure and communicate systemic impact using the ontology.



## Ontological Reasoning

Generate insights from ontological patterns and relationships.



## Knowledge Sharing

Foster collaboration by sharing ontology-based best practices.

## Compass Ontology



Miro

**A private Miro board**



# Case Study

## Compass Ontology & Mareto in Ki-Low-Na Friendship Society Tupa's Lodge

1

### Understand Compass Ontology

Study structure, classes, properties, and relationships. Identify key concepts.

2

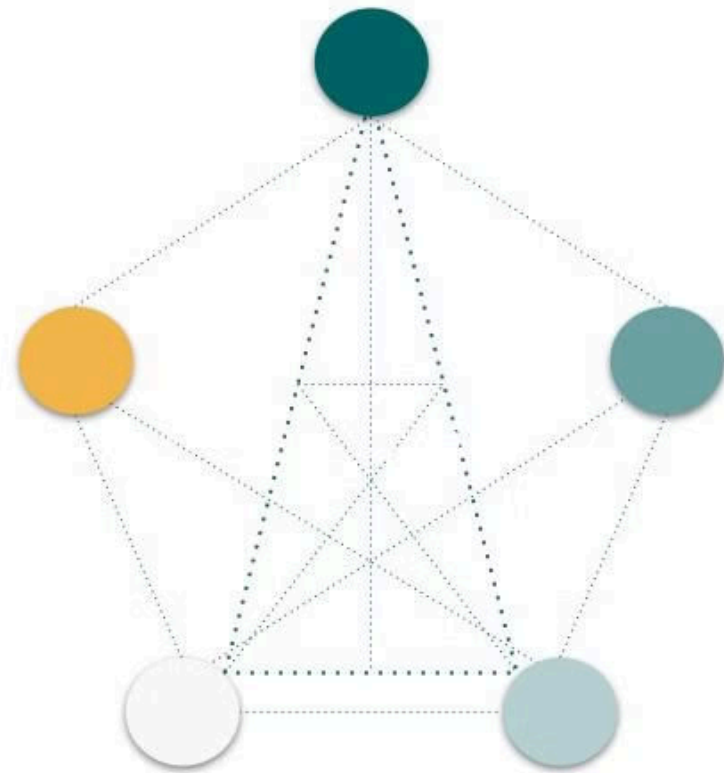
### Map Mareto Data Elements

Review data elements, map to ontology classes/properties. Identify gaps.

# Aligning Data Collection to Systems Change Goals

How might we connect the dots?

- Funders
- Service / Housing Providers
- Allied Systems
- Natural Supports



# Key Performance Indicators



# Adapting Mareto's Data Collection

1

## Align Data Collection

Modify Mareto forms to capture all data per Compass Ontology

2

## Implement Validation

Set up rules to ensure data integrity based on ontology constraints.

3

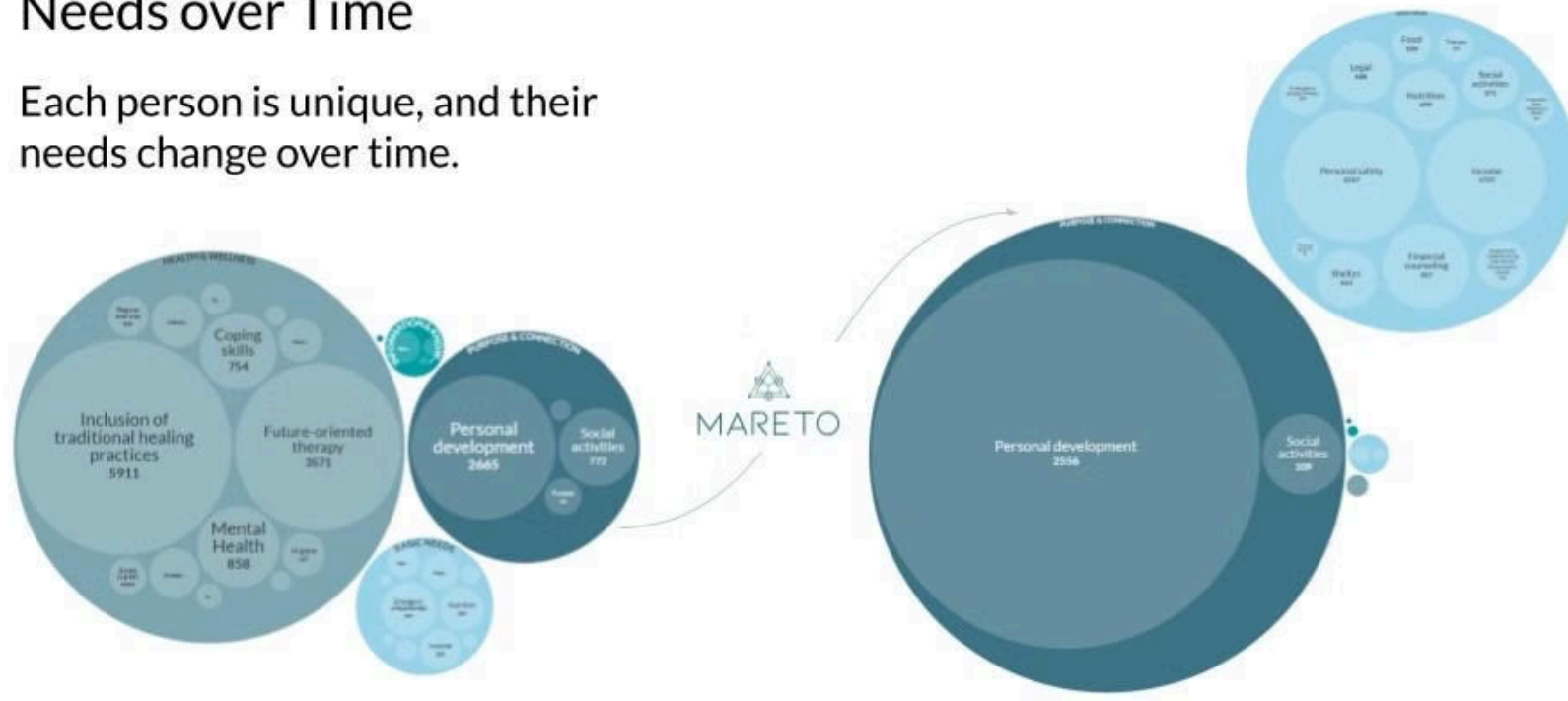
## Train Staff

Educate on ontology structure and consistent data entry.

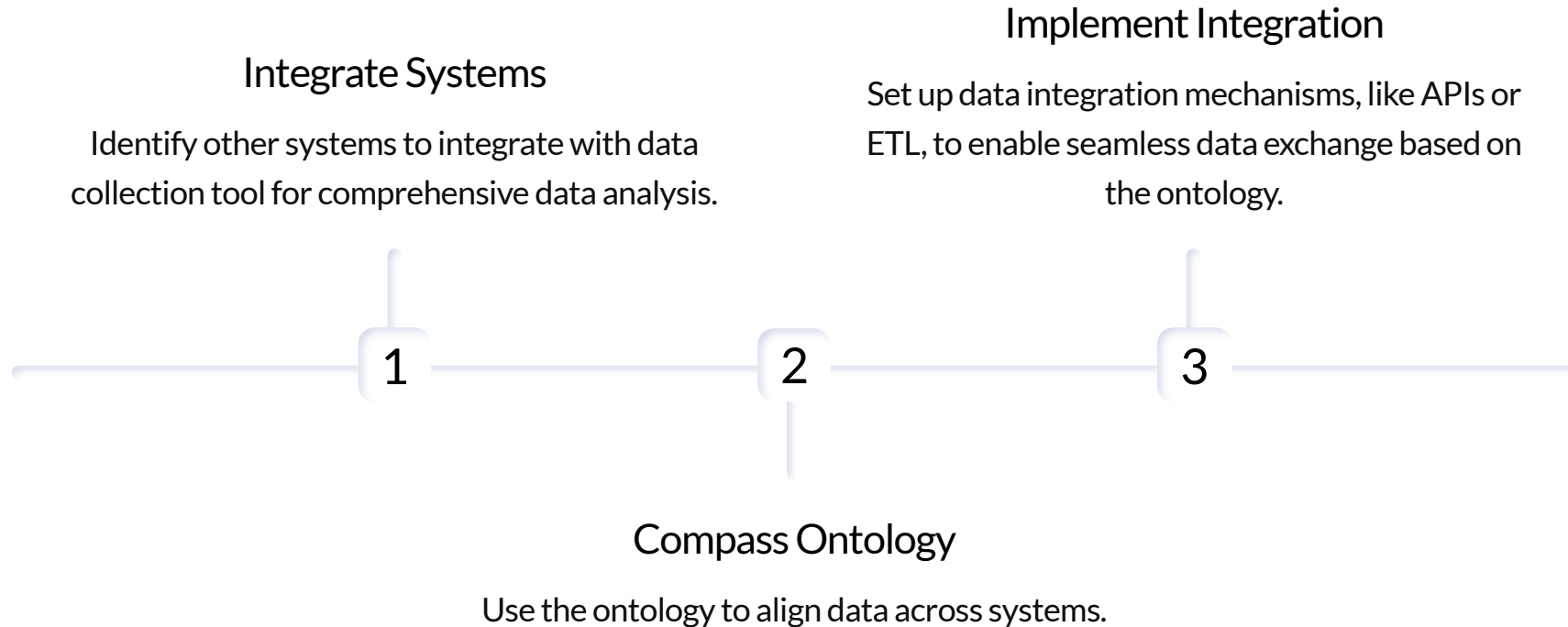
# The Client Directly Shapes Data Collection & Insights

Assessing Impact on Client Complexity of Needs over Time

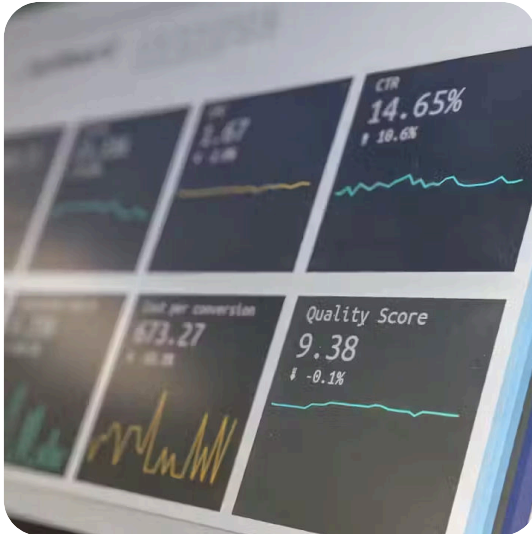
Each person is unique, and their needs change over time.



# Integrating with Other Systems



# Ontology-Based Analysis and Reporting



## Advanced Data Analysis

Use the ontology to analyze data and find insights.

```
31 def
32 self.file = None
33 self.fingerprints = self()
34 self.logdupes = True
35 self.debug = debug
36 self.logger = logging.getLogger(__name__)
37 if path:
38 self.file = open(os.path.join(path,
39 self.file.seek(0)
40 self.fingerprints.update(s, request)
41
42 @classmethod
43 def from_settings(cls, settings):
44 debug = settings.getbool('debug', True)
45 return cls(job_dir(settings), debug)
46
47 def request_seen(self, request):
48 fp = self.request_fingerprint(request)
49 if fp in self.fingerprints:
50 return True
51 self.fingerprints.add(fp)
52 if self.file:
53 self.file.write(fp + os.linesep)
54
55 def request_fingerprint(self, request):
56 return request_fingerprint(request)
```

## Ontology-Based Queries

Leverage ontology-based queries to uncover patterns across datasets.



## Consistent Reporting

Create reports aligned with the ontology's structure.

# Continuously Monitor and Refine



## Data Quality Monitoring

Monitor data quality based on the Compass ontology's standards.



## Gather Feedback

Get feedback on the ontology-aligned data collection process.

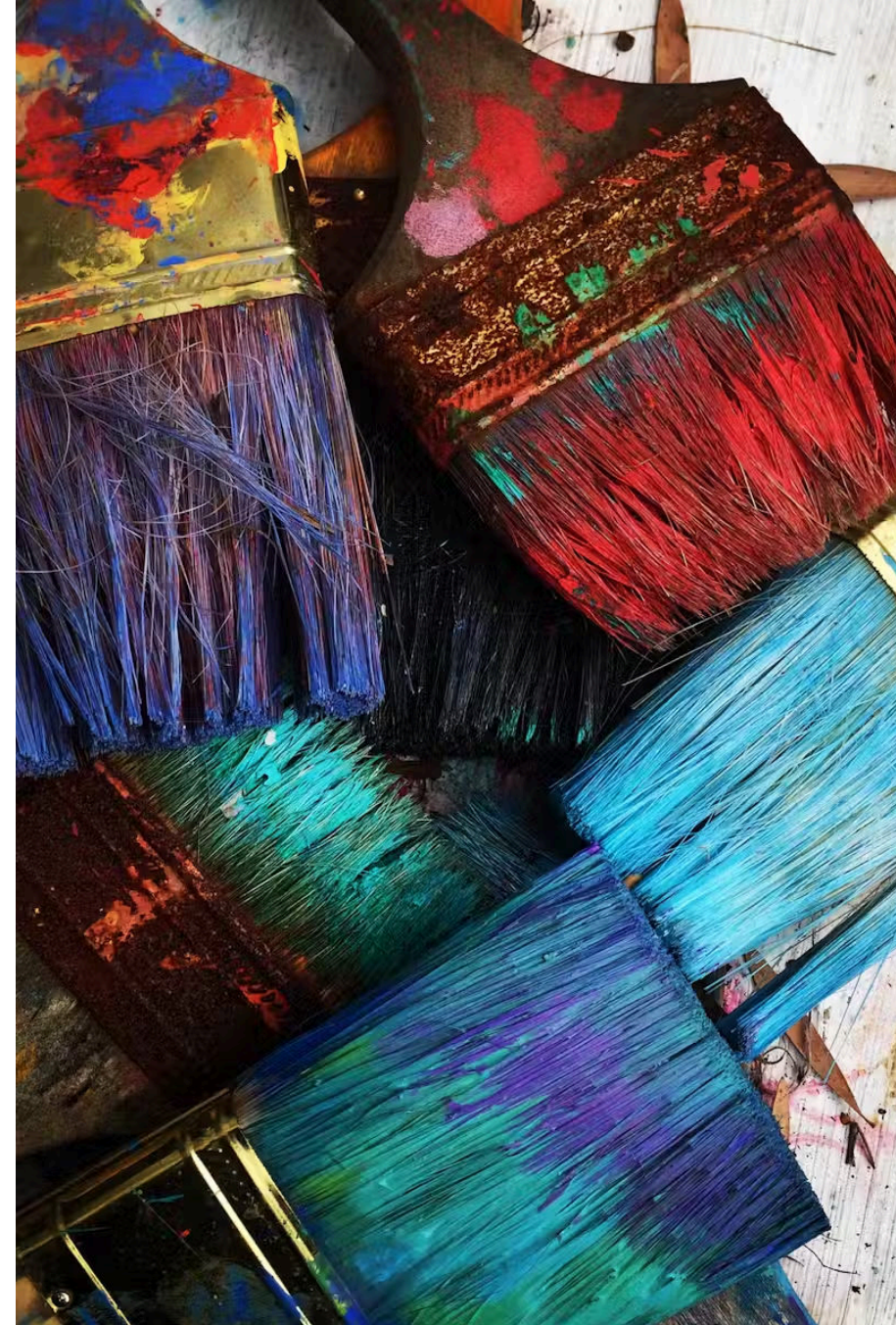


## Refine and Update

Evolve the ontology and data practices to meet changing needs.

# Collaborate and Share Knowledge

- 1 **Engage Stakeholders**
- 2 **Share Best Practices**
- 3 **Stay Updated**
- 4 **Prioritize Client Perspective**



# Implementing Advanced Data Ontologies

1

## Ontology Development

Stakeholder engagement, domain analysis, iterative refinement.

2

## Tools & Tech

Ontology editors, data mapping, reasoning engines.

3

## Adoption Strategies

Ensure long-term success through change management, training, and continuous improvement.

# Key Takeaways



## Enabling Cross-Sector Communication

Ontologies bridge communication gaps, integrate data, and drive systemic change.



## Measuring Systemic Change

Ontologies enable comprehensive data analysis to drive systemic change.

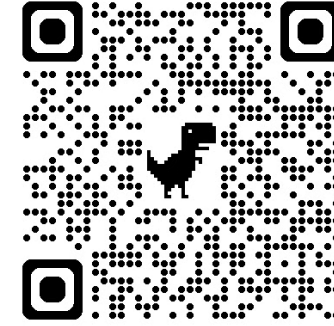


## Continuous Refinement

Ontologies require ongoing planning, engagement, and refinement to stay relevant.

# Next Webinar

## Engaging Lived Experience and Frontline Service Staff in Shaping Data Collection Systems for Collective Impact



**Jul 18, 2024 10:00 AM MST**

### Key Takeaways:



#### Systems Change

Leverage lived experience for holistic data systems.



#### Collective Impact

Foster community goals and enhanced outcomes.



#### Real-World Insights

Learn from Mareto's successes and challenges.

### Who Should Attend?

Service Providers

Data Analysts

Policy Makers

Nonprofit Leaders

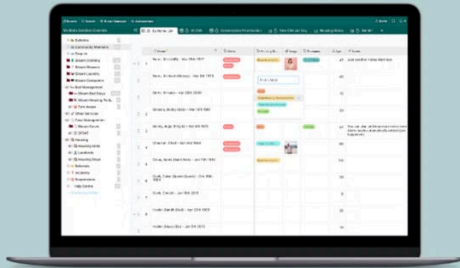
# Get in touch

[alina@helpseeker.org](mailto:alina@helpseeker.org)

[helpseeker.org](https://helpseeker.org)

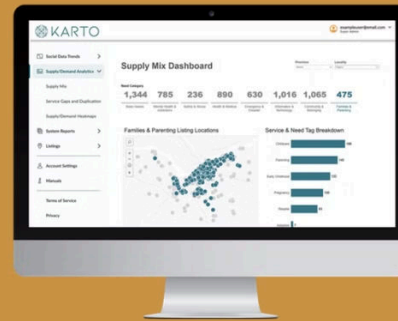
## Mareto - Case Management Software

Fully customizable case management software designed specifically for the Social Services to manage client journeys from the initial intake to the final outcome.



## Karto - Data & Analytics Platform

Get access to social data and experts all in one place. Understand your community needs and make informed, impactful decisions with ease.



## Navigi - Social Services Search Engine

Your go-to search engine to quickly find all of the social support services in your community.

