Factsheet – Step 6
Common Data Models (CDMs)

What are CDMs?

A CDM is a standardized, consistent and shared data structure designed to organize and describe data in a way that facilitates interoperability and data integration across various applications and domains. The goal of a CDM is to establish a common understanding and representation of data, reducing the complexity and effort required for data sharing and integration.

Key aspects of CDMs

1. **Consistency:** The model ensures that data is represented and structured consistently, regardless of the source or application. This consistency simplifies data integration processes.
2. **Standardization:** A CDM often adheres to industry or domain standards, promoting uniformity and compatibility across different systems and organizations.
3. **Interoperability:** By providing a shared data structure, a CDM promotes interoperability between disparate systems. This is particularly valuable in environments where various applications need to exchange and utilize data seamlessly.
4. **Reusability:** A CDM allows for the reuse of data models across different projects or applications. This can save time and resources, as organizations can leverage existing models rather than creating new ones from scratch.
5. **Scalability:** A well-designed CDM is scalable, meaning it can accommodate changes and additions to data over time without requiring a complete overhaul of the model.

Microsoft's CDM is a widely used example. It is part of the broader Microsoft Power Platform and is designed to provide data for applications like Power BI, PowerApps and Dynamics 365.

In addition to industry-specific CDMs, there are efforts to create cross-industry models that can be applied more broadly. These models aim to provide a shared understanding of common data entities, such as customers, products and transactions, across diverse industries.

Using a CDM can be especially beneficial in scenarios where data needs to be shared and integrated across different systems, applications and organizations, promoting data interoperability and reducing the complexity of data management.

Examples of CDMs

In agriculture and agronomy, several CDMS have been developed to standardize the representation and exchange of information across various systems and applications. These models aim to facilitate interoperability, data integration, and collaboration within the agricultural sector. Here are some of the main CDMs used in agronomy and agriculture:

1. **AgGateway ADAPT framework**
    - The AgGateway organization has developed the ADAPT (Agricultural Data Application Programming Toolkit) framework. ADAPT provides a set of standards for the exchange of agronomic and machine data, allowing different software applications and agricultural equipment to communicate seamlessly.
2. **ISO 11783 (ISOBUS)**
    - ISO 11783, commonly known as ISOBUS, is an international standard for the communication between tractors and implements. It defines a protocol for the electronic control and monitoring of agricultural equipment, promoting interoperability between different manufacturers' systems.
3. **AgXML**
    - AgXML is an XML-based standard developed by AgGateway for the exchange of agricultural business information. It covers various aspects of agriculture, including crop production data, inventory management, and agronomic practices.

4. **SensorML and OGC Sensor Web Enablement (SWE)**
    - The Open Geospatial Consortium (OGC) has developed the standards SensorML and Sensor Web Enablement (SWE) to facilitate the exchange of sensor data. These standards are relevant in agriculture for managing and sharing data from agricultural sensors and monitoring systems.
5. **GS1 System for identification and traceability**
    - GS1 provides a framework for the unique identification and traceability of agricultural products. This standard helps track products throughout the supply chain, promoting transparency and efficiency.
6. **Crop Ontology**
    - The Crop Ontology is an effort to standardize the representation of crop-related information. It provides a common vocabulary and ontology for describing crop traits, germplasm, and experimental data, fostering collaboration in crop research.
7. **Agricultural Information Model (AgIM)**
    - The Agricultural Information Model (AgIM) is a data model developed by the Agricultural Data Coalition (ADC). It aims to standardize data formats for sharing and integrating farm data, promoting data portability and interoperability.

These CDMsplay a crucial role in enhancing data interoperability, enabling farmers, researchers and agricultural stakeholders to exchange information seamlessly and make more informed decisions. The adoption of these standards contributes to the development of precision agriculture, smart farming, and data-driven approaches in the agricultural sector. Keep in mind that the landscape of agricultural data standards may evolve, and new models may emerge to address emerging challenges and opportunities in agriculture.