Practical lessons from data hub implementation

J. Frandsen[1] and C. Murphy[2]

[1]Seges Innovation, 15,Agro Food Park 8200 Aarhus, Denmark
[2]CMA, P.O. Box 120, Richmond VIC 3121, Australia
Corresponding Author: jhf@seges.dk

Abstract

The International Dairy Data Exchange Network (iDDEN) was developed to optimise data exchange between dairy herds, dairy data organisations, farm service providers, dairy equipment manufacturers and on-farm software organisations. The implementation of iDDEN's data exchange hub by dairy data organisations and equipment manufacturers provides practical lessons on solving the drivers, barriers and challenges of innovation uptake and change in this area.

The drivers of more streamlined data exchange are from organisations seeking operational efficiencies and lower operating costs (including reduced manual data entry and transfer), standardisation of interfaces and animal data, access to data that is currently inaccessible or difficult to retrieve, and a consistent data transfer mechanism for the increasing number of devices and sensors on-farm.

Barriers and challenges to optimising data exchange and uptake that iDDEN has addressed are a combination of technical, regulatory, and organisational elements.

A standardised approach and the use of open standards means that technical difficulties and obstacles to implementation are relatively minor compared to these other factors.

Regulatory barriers are usually due to confusion about data use regulations and oversight and having to translate and understand legal jargon, especially across different countries. These hurdles can be overcome via good communication and the use of standardised, simple data use agreements.

Organisational barriers include a desire to 'control' data, a lack of a data management strategy, or an unclear business case on the value of data sharing. iDDEN has worked with both technical teams and senior management to ensure there is not a disconnect in the organisation about the importance of data exchange and it is seen as a business imperative.

Keywords: data exchange, data transfer, innovation, standardisation.

Introduction

The International Dairy Data Exchange Network (iDDEN) was developed to optimise data exchange between dairy herds, dairy data organisations, farm service providers, dairy equipment manufacturers and on-farm software organisations.

iDDEN is the largest international dairy data partnership, bringing together farmer-owned organizations and national databases across thirteen countries representing approximately 200,000 dairy herds, 20 million dairy cows in total and 13 million milk recorded dairy cows.

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iDDEN is owned and governed by a consortium of farmer-controlled member organizations from different countries providing dairy data services in Australia, Austria, Belgium, Canada, Denmark, Germany, Iceland, Finland, Luxembourg, Norway, Sweden, The Netherlands, and the United States. The seven IDDEN foundation shareholders are CRV, DataGene, Lactanet, National Dairy Herd Information Association (NDHIA), NCDX (Nordic countries), RDV, and vit.

The iDDEN hub enables two-way data exchange between farm management system software located on-farm and cloud-based farm management system solutions with milk recording and other industry organisations databases located around the world.

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The implementation of iDDEN's data exchange hub by dairy data organisations and equipment manufacturers provides practical lessons on solving the drivers, barriers and challenges of innovation uptake and change in this area.

The barriers and challenges to data exchange

The barriers and challenges to optimising data exchange and uptake that iDDEN has addressed are a combination of technical, regulatory, and organisational elements.

Technical

Technical barriers and challenges

Data hub implementations involve integrating data from various sources and systems. This can result in complexity and challenges associated with data integration, such as data format differences, data quality issues, and data synchronization problems. It underscores the need for robust and standardised data integration strategies and tools.

Data hub implementations often involve an iterative process of development and refinement. Many organizations realize the importance of adopting an agile approach, enabling them to iterate and test the data integration before going into the full 'production' environment. Flexibility, adaptability, and continuous 'real world' testing become essential for addressing technical barriers and challenges with implementing a data exchange.

A data hub implementation highlights the importance of establishing centralized data governance processes and frameworks. It is evident that consistent data definitions, standards, and policies are crucial for ensuring data quality, integrity, and security across the organization and its data exchange partners.

Specific technical barriers and challenges to data exchange encountered to date include dairy data organisations, farm service providers, dairy equipment manufacturers and on-farm software organisations operating across different countries, languages, and data providers (using different data definitions). The key technical barrier however is a lack of people or resources allocated to the data hub implementation and integration.

A standardised approach and the use of open standards means that technical difficulties and obstacles to implementation are relatively minor compared to these other factors. Key approaches have been:

- Standardize as much as possible – for example, using Open Standards and International Committee for Animal Recording (ICAR) Animal Data Exchange (ADE) data definitions. iDDEN has implemented the ICAR ADE data message standards, and these common standards and guidelines make data interchange easier and more effective.

- Provide a high level of technical support, including an information pack for new users, biweekly coordination meetings during the integration phase, and technical discussions via a dedicated Slack channel.

- Provide support tools such as a Translation Tool to support companies for different languages and markets and an Admin Tool to monitor the day-to-day operation of the data exchange.

- Engage a professional service partner; in iDDEN's case, Mtech (Finland), an experienced agricultural software service provider.

- Ensure a critical size of the organisation to finance the necessary technical infrastructure and to influence or set data standards.

Solutions and practical lessons learned.

Data hub implementations necessitate handling data from multiple sources. Organizations appreciate the criticality of robust technical and organisational measures to protect data security and ensure compliance with regulations. Specific regulatory or legal barriers and challenges encountered to date with some of iDDEN's partners include confusion about data use regulations in different countries or jurisdictions, disconnection between technical teams, senior management, and legal representatives (especially around interpreting and understanding legal jargon). However, the key concern raised during discussions on data hub implementation is whether data is stored or not.

Regulatory / legal

Regulatory and legal barriers and challenges

The iDDEN solution is designed to ensure that no data is stored within the system other than temporarily to deal with technical interruptions and the use of log files to help customers monitor their own data exchange.

iDDEN uses standardised, simple data use agreements and authentication approaches to ensure that farmers retain control of their data. iDDEN also has an international approach in dealing with regulatory and legal matters, especially as many current and potential partners most are global or operate across several countries.

Solutions and practical lessons learned

Implementing a data hub often requires a cultural shift within the organization towards a data-driven mindset. iDDEN's experience shows that organizations with successful data exchange implementations have senior executive sponsorship, technical buy-in, and a "data sharing" culture at all levels. Collaboration and communication become vital to achieving data-driven objectives.

Companies that are unclear on the value of a data exchange usually have no data management strategy or want to 'control' data (both their 'own' and even that from other sources). Often, in these cases, data exchange is seen as a "technical function" instead of a business priority and there is a disconnect between the technical teams

Organisational

Organisational barriers and challenges

and senior management (the "decision makers"). As a result, there is limited focus and budget allocated to data exchange.

Solutions and practical lessons learned

A key lesson from data hub implementations is the focus on deriving tangible business value. Successful organizations align data initiatives with strategic objectives and prioritize use cases that deliver significant outcomes. The key lessons in this area have been the importance of ongoing engagement and communication at multiple levels with partner organisations. Other key factors to overcome organisational barriers include simplifying the data exchange process as much as possible' having ownership and governance of iDDEN by a consortium of farmer-controlled member organisations from around the world, and implementing an Advisory Committee comprising iDDEN shareholders and strategic partners.

Conclusions

Overall, implementing a data hub has provided practical insights into various aspects of data management, governance, integration, security, and culture. These lessons have guided iDDEN and its partner organizations in building robust data ecosystems that support informed decision-making, innovation, and competitive advantage.

A summary of practical lessons from iDDEN's data hub implementation:

- Farmers want their service organizations to help them make better use of data.

- The benefits to data exchange are clear – but not all companies or organisations have seen the value (yet).

- Overcoming technical barriers to data exchange is relatively easy, especially when a standardised approach and common data standards are used.

- Legal or regulatory barriers can be overcome by only exchanging (not storing data), authentication, and standard agreements.

- Any organisational barriers are addressed by frequent communication, simplifying data exchange, and building trust.