Eight Years of Enabling eBusiness in Agriculture

InfoAg

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Jim Wilson, Standards Director, AgGateway
Dr. Joe Tevis, Director, Agronomic Products and Services, TopCon
What we’ll discuss...

• What is AgGateway and why do we exist?
• How AgGateway operates
• How AgGateway promotes, enables and expands eBusiness in Agriculture
• A brief survey of AgGateway projects
• The SPADE (Standardized Precision Ag Data Exchange) Project
AgGateway: Who we are

- A non-profit, ag-industry, membership association
- Broad representation across ag segments
- Focus on eBusiness for better supply chain and field operation efficiencies
- Working together to develop and implement common industry standards, guidelines and tools

Non-profit funded by:
- Member dues
- Subscriptions
- Activity fees
AgGateway: What we are not!

- At no time does any operational data transit AgGateway networks.
- AgGateway does not receive, store, process or deliver any of the following:
  - Work orders
  - Work records
  - Purchase orders
  - Invoices
  - Ship notices
  - And so on...
AgGateway Vision

AgGateway will be the recognized international source for enabling the use of information and communication technologies for agriculture.
Mission

Promote, enable and expand eBusiness in agriculture
AgGateway Brief History

AgChem Alliance for eCommerce formed
AgGateway Brief History

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- '08: AgGateway formed
- '10: RAPID merged into AgGateway

Timeline:
- '88
- '95
- '00
- '01
- '02
- '03
- '04
- '05
- '06
- '07
- '08
- '09
- '10
- '11
- '12
- '13
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- ‘05: RAPID merged into AgGateway
- ‘06: Precision Ag Council formed
- ‘07: AgXML moved operations to AgGateway’s newly formed Grain Council
- ‘08
- ‘09
- ‘10
- ‘11
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- ‘13
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- Today: 8 councils and 214 member companies
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AgGateway North America Membership

- '05: 0
- '06: 10
- '07: 20
- '08: 30
- '09: 40
- '10: 50
- '11: 60
- '12: 70
- '13: 80
- '14: 90
How AgGateway Defines Key Terms

- Standards
- Guidelines
- Enabling Technologies
AgGateway Scope

• What we do
  • Facilitate implementation projects
  • Document business processes
  • Specify some data standards
  • Document implementation guidelines for:
    • Data standards
    • Transport, routing, and packaging protocols
    • Data security

• What others do
  • Specify equipment standards
  • Specify safety standards
  • Specify data standards
  • Specify transport, routing, and packaging protocols
  • Specify data security protocols
How AgGateway operates
How we operate: a consortium

- **Collaboration** (interested parties working together)
- Member participation is key to success!
- Work together to develop standards, guidelines, tools and techniques for implementation
How is AgGateway organized?

• Small number of staff
• Many volunteers
• Councils (by industry segment)
• BOD & Management team
• Standing committees
• Task forces
• Project teams
Councils

• Industry segment councils operate with relative independence.
• Each has a chair and co-chair.
• Conference calls, face-to-face at Mid-Year Meeting and Annual Meeting.
• Decide on and manage the priorities and project work that make eBusiness a reality.
How we promote, enable and expand eBusiness in Agriculture...
Promoting, enabling and expanding eBusiness in Agriculture...

• **Collaboration** – working together as an industry, through
  • Our organizational structure – Councils, Committees, Task Forces and Working Groups
  • Our Antitrust Guidelines
  • Working meetings - Mid-Year Meeting, Annual Conference and other face-to-face meetings
• Projects
• AgGateway Website
• AgGateway Wiki
Promoting, enabling and expanding eBusiness in Agriculture...

- **Communication - awareness and education**
  - AgGateway website, monthly newsletter and emails
  - Press releases and articles in the agriculture media
  - Educational sessions and demonstrations at the Mid-Year Meeting, Annual Conference, and through webinars
Promoting, enabling and expanding eBusiness in Agriculture...

- **Implementation – Putting the standards to use**
  - Provide support for a collaborative approach to projects: project coordination, communications and other administrative functions.
  - Project participants work through business use cases, standards review or develop new messages based on the data requirements for the business processes and determine business rules for implementation.
  - Offer Enabling Services
Promoting, enabling and expanding eBusiness in Agriculture...

- **Projects completed or in progress**
  - AEC—“Accelerated Electronic Connectivity”
    - Ordering, Shipping, Invoicing, Sales Reporting
    - > 70% of CP industry sales transactions between manufacturers and distributors are electronic
  - Seed Connectivity (SC) - Shipping, Invoicing, Reporting
  - **Seed Connectivity II** underway – Seed booking and ordering
  - Crop Nutrient Connectivity (CNC) - Contracts, Ordering, Shipping, and Invoicing
  - **CNC II** underway – transaction implementation
  - Product Cost Information (PCI) - Electronic distribution of pricing data from manufacturers to distributors
Promoting, enabling and expanding eBusiness in Agriculture...

- **Projects completed or in progress**
  - Fertilizer Tonnage Reporting (Fertilizer and Feed) pilot completed with Michigan, South Carolina and Pennsylvania
    - Standardized format to streamline reporting tonnage fees to states
    - Expanded to industry initiative with Agricultural Retailers Assn and The Fertilizer Institute (TFI) led by TFI and supported by AgGateway
  - **Precision Ag Irrigation Leadership (PAIL)** underway
    - Creating common standards, implementation guidelines and data transfer protocols to and from FMIS to irrigation equipment
    - Improving data exchange processes for precision ag to help growers irrigate their land in smarter ways
  - **Crop Protection Canada Connectivity (CPCC)** underway
    - Order to Invoice within the Canadian Crop Protection industry segment
    - Expands benefits of AEC to Canada
- Additional projects planned/in development such as telematics, auto information identification capture, etc.
Promoting, enabling and expanding eBusiness in Agriculture...

• Projects completed or in progress
  • **Standardized Precision Ag Data Exchange (SPADE)** nearing completion
    • Creating common standards, implementation guidelines and data transfer protocols to and from Farm Management Information Systems (FMIS) and field equipment for Seed Planting
    • Standards to be published in July 2014
  • **SPADE2** underway
    • Expanding to other operations such as Harvest and Crop Protection
    • Data Exchange and Conversion API Proof-of-Concept (limited defined scope)
July News

• Made ISO 11783-10 ISOXML extensions available for download and public comment
• Launched agricultural glossary [http://AgGlossary.org](http://AgGlossary.org) (issued press release)
• Signed LOI with ASABE to collaborate on standards
AgGateway Global Network
Overview

• Why? AgGateway members with global operations want to leverage their eBusiness investment globally

• In the formation stage

• Meeting in Paris in June 2014 – very positive response

• Incorporation complete

• Commitment/funding being finalized

• Plan to launch Europe, Middle East and Africa-based organization later this year (meeting at CropLife International in Brussels in September)

• Take initial steps for South America-based organization later this year

• Take initial steps for Asia-Pacific-based organization next year
SPADE Project Overview
SPADE

Standardized Precision Ag Data Exchange
SPADE Project

• A collaboration among agricultural suppliers of hardware, software, inputs, services, implements and vehicles for improved data exchange and interoperability targeting farm operations of seeding, tillage, fertilizing, spraying and harvest to maximize the value of precision agriculture through seamless and transparent data exchange.
SPADE seeks to

- Establish a framework of standards to simplify mixed-fleet field operations, regulatory compliance, crop insurance reporting, traceability, sustainability assessment and field or crop-scale revenue management.
- Allow seamless data exchange between hardware systems and software applications that collect field data across farming operations.
- Make it easier for growers to deliver data with their trusted advisors, suppliers, and other value partners, who often use different system components.
- Lower the cost of entry for growers and ag retailers who want to use precision ag, through transparent data exchange and interoperability.
SPADE will enable growers & agri-businesses to achieve:

• Simplified data access, maintenance and recall with less hassle
• Enhanced yield through simplified practice of site-specific operations
• Improved net revenue performance with measureable results.
SPADE1 Project Scope
SPADE1 Project Scope
SPADE Stakeholders

**Grower:** Owner-operator, Corporate Farm, Farm Manager

**Government Agencies:** NRCS, FSA, RMA, EPA?

**Government Agents:** FSA Agent, AIP, TSP

**Service Provider:** Agronomy, Application, Banker

**Business Partner/Supplier:** Seed/Chemical Co., Machinery Dealer
SPADE Technologies

- **Internet/Web** Services Communication
- **FMIS**: Farm Management Information Systems
- **Database Management Systems/IT**
- **MICS**: Mobile Implement Control Systems
- **Telemetry/Wireless** Communication
SPADE Scope

Plan Development

- Crop Type
- Intended Use
- Seed ID
- Customer GLN
- Implement Use

- Handling Instr.
- Restricted Areas
- Target Pests
Plan Development

Access Reference Data

• Crop Type
• Intended Use
• Seed ID
• Customer GLN
• Implement Use

• Handling Instr.
• Restricted Areas
• Target Pests

FMIS

AgGateway Reference Data

Index

Seeds & Chemicals

USDA Crop and CropUse (CVT) Equipment

ISO 11783 Taskdata

AgGateway

AIP TSP

FSA NRCS RMA

Work Order

Crop Seeding Plan

Prescription

Recommendation

Crop Seeding Plan

Compliance Reports
Plan Development

Access Reference Data

- Crop Type
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Compliance Reporting

- Handling Instr.
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AgGateway Reference Data

Index

- Seeds & Chemicals
- USDA Crop and CropUse (CVT) Information
SPADEV Scope

Plan Development

Compliance Reporting

Task Execution and Reporting

Access Reference Data

- Crop Type
- Intended Use
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- Customer GLN
- Implement Use

Handling Instr.
- Restricted Areas
- Target Pests

ISO 11783 Taskdata

FMIS
SPADE Project Process

User Stories

Use Case Development/Process Diagrams

“Data Buckets”

ISO Gap Analysis
SPADE Project Process

User Stories

Use Case Development/Process Diagrams

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ISO Gap Analysis

Subject Matter Experts
Sales Managers
Agronomy Managers
SPADE Project Process

User Stories
Use Case Development/Process Diagrams
“Data Buckets”
ISO Gap Analysis

Subject Matter Experts
Sales Managers
Agronomy Managers

Technical Experts
System Architects
Software Developers
Machine Designers
SPADE1 Seeding “Stories”

• Seeding from a Salesman Perspective
• Crop Insurance
• Specialty Crop
• California Permit
• Traits, treatments and lot numbers from DOW
• Machinery Story
SPADE1 Seeding Use Cases

- Historical Field Data Business Use Case
- Create Seeding Plan Use Case
- Create Recommendation Use Case
- Create Work Order Use Case
- Create Product Application Prescription Use Case
- Create Work Record Use Case
- Create Summary Work Record for Submission Use Case
SPADE1 Seeding  “Data Buckets”

• Plan
• Recommendation
• Work Order
  • SPADE + ISO taskdata.xml
• Work Record
  • SPADE + ISO taskdata.xml
ISO Gap Analysis Deliverables

• Enhancement Proposals - ISO 11783-10 (Task Controller and management information system interchange)
  • Annex E – Predefined ISO-11783 attachments (UUID)
• DDI Proposals - ISO 11783 -11 Mobile Data Element Dictionary
• SPADE Extensions
• SPADE Data Model
  • SPADE Extensions + ISO taskdata.xml
SPADE2 Project Timeline

- April 2013: Board Approves Project
- June 2013: Project Kick-off
- July 2013: Panel Discussion - InfoAg
- Nov 2013: Demo at AgGateway Annual Conference
- April 2014: SPADE Conversion Toolbox POC Demo at AEF Plugfest
- July 2014: Presentation at InfoAg
- Dec 2014: SPADE2 Closed
SPADE2 Scope
SPADE2 Scope
SPADE2 Scope
SPADE2 Scope
SPADE2 Participants

- **Hardware Technologies**
  - Ag Leader
  - Agtelligent
  - Digi-Star
  - Raven Industries

- **Ag Retails & Service Providers**
  - Agrian
  - Agri-Intranet
  - Brandt
  - Co-Alliance
  - CropIMS
  - GROWMARK
  - Helena Chemical
  - Wilbur-Ellis
  - Willard AgriService
  - Winfield Solutions, LLC

- **Crop Insurance**
  - ProAg
  - Rain & Hail

- **Crop Input Manufacturers**
  - BASF
  - Monstanto
  - Syngenta

- **Equipment Manufacturers**
  - AGCO
  - CNH
  - CLAAS Omaha
  - John Deere

- **FMIS & IT**
  - Ag Connections
  - Ag Integrated
  - F4F (First 4 Farming)
  - GeoSys
  - MapShots
  - Software Solutions Integrated
  - SST
  - Topcon
  - XS Inc
  - Zedx
SPADE2 Activities

- Mechanical Harvest
- Non-Mechanical Harvest
- Crop Protection Application
- Regulatory Reporting
- AGIIS Integration
- Reference Data API
- SPADE Conversion Toolbox (meeting tomorrow – Friday)
Example: OK to Spray

Evaluate any single unevaluated OK to Spray criterion

- at least one unevaluated OK to Spray criterion exists
  
  - evaluation passes
    
    - no unevaluated OK to Spray criterion exists
      
      - Conclude that it is OK to Spray
    
    - evaluation fails
      
      - Conclude that it is Not OK to Spray
Questions?
1. eBusiness Fundamentals

2. Standards, Guidelines, and Implementation Technologies

3. Getting Started
eBusiness Fundamentals

• In this section we cover what’s required for eBusiness:
  • Processes
  • Messages
  • Identifiers
  • Message Transport & Routing
  • Data Privacy & Security
  • Message Creation & Consumption
Processes

• The context in which
  • Products and services are delivered/received
  • Payments are sent/received
  • Supporting activities are executed

• Require communications to support

• Electronic communications are more productive than manual alternatives

• Two views
  • Activity flow
  • States and transitions
Messages

• Name
• Always sent/received in the context of a process
• Structure
• Data
  • Stand-alone values
  • Identifiers
  • Code lists
  • Reference data
Identifiers

- Identify things
- Single vs multiple identifiers
- Distinguish one thing from another
- Determine that two things are the same
- Should be free of semantics
- Things commonly requiring identification
  - Products
  - Logistics units
  - Locations
  - People
  - Companies
  - Company organizational units
Message Creation

• An event occurs in your business that triggers a need to send a message. For example, the event could be the need to order triggered by low inventory.
• Create/retrieve data from appropriate system or systems.
• Format the data in a way agreeable to your trading partner.
• Deliver message to business messaging server, with metadata as required.
• Process business acknowledgements as required (this step overlaps with message consumption).
Message Consumption

• Store the messages in a persistent data store (e.g., database, file system, cloud service)
• Determine the business-process context to which the incoming message applies
• Perform security validation, if necessary
• Confirm that message is complete, consistent, and conforms to other business rules.
• If necessary, transform the message into a format (or formats) suitable for ingestion into the receiving system.
• Ingest the message content.
• Confirm conformance to additional business rules not validated earlier.
• Provide business-level acknowledgements to the sender per agreement.
Message Transport & Routing

• Provides a message envelope
• Moves messages from one trading partner to another
• Provides support for security
Data Privacy, Security, & Ownership

- Privacy
- Authentication
- Integrity
- Non-Repudiation
- Authorization
- Data ownership
1. eBusiness Fundamentals

2. Standards, Guidelines, and Implementation Technologies

3. Getting Started
Standards, Guidelines and Implementation Technologies

In this section we’ll learn about AgGateway resources that make eBusiness implementation easier, including:

• Business Process Guidelines
• Message Standards and Implementation Technologies
• Transport & Routing Standards, Guidelines, and Implementation Technologies
• Identifier Standards, Guidelines, and Implementation Technologies
• Glossary
• Reference Data Guidelines and Implementation Technologies
Business Process Guidelines

- Written:
  - Business use cases of various levels of formality and detail
  - User stories/vignettes
- Diagrammatic:
  - UML activity diagrams
  - UML state diagrams
  - BPMN diagrams
- Guidelines vs standards
Message Standards and Implementation Technologies

- Ag eStandards
- Message Use Guidelines
- CLICK
- OAGIS 10
- ISO 11783/10 with AgGateway Extensions
Identifier Standards, Guidelines, and Implementation Technologies

• AGIIS
• GTINs
• GLNs
• Seed License Agreements
• AgGateway Platform
Transport & Routing Standards, Guidelines and Implementation Tech.

- Guidelines
- ebMS
- Web Services
- NEXUSe2e
Glossary

• For the past two years AgGateway’s Precision Agriculture Council has developed a glossary

• Reached out to:
  • Federal government agencies
  • State governments
  • Academia
  • Industry groups
  • AgGateway councils for input.

• In addition to the basic term/definition functionality, the glossary team implemented support for taxonomy development.

• AgGateway anticipates releasing the glossary in 2014.
Reference Data Guidelines and Implementation Technologies

• SPADE and reference data requirements
• Reference data index
• Relationship to AgGateway Platform
Data Ownership

Data ownership and privacy guidelines is a nascent AgGateway focus area with global applicability. As of late 2013 there is no projected completion date.
1. eBusiness Fundamentals

2. Standards, Guidelines, and Implementation Technologies

3. Getting Started
Getting Started

• If your company is not an AgGateway member, join
• Get involved in councils
• Get involved in projects
• Get involved in the Standards & Guidelines Committee
• Review your company’s business strategy: Does it address eBusiness?