

CONTROL ID: 2462912

TITLE: SPADE's Core Documents: A model for representing field operations business processes

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CURRENT TECHNICAL COMMUNITY: Information, Technology, Sensors, & Control Systems

CURRENT SESSION CATEGORY: Big data, data analysis and APPs (including teaching methods)

ABSTRACT BODY:

Abstract Body: Contemporary agriculture requires increasingly detailed recordkeeping of field operations such as planting, spraying, fertilization and harvest. This responds partly to regulatory pressure, and also to supply-chain interest in traceability and sustainability. Growers and other stakeholders use a variety of instruments or "documents" to exchange field operations information as part of a farm's business processes. Although there have been attempts at standardizing a nomenclature of farm processes (e.g., ISO22006), the documents and many of the terms used therein have yet to be unambiguously defined. AgGateway, a nonprofit consortium of 240+ companies, chartered the SPADE (Standardized Precision Ag Data Exchange) project in 2012 to enable seamless data exchange between machines and farm management information systems (FMIS). One of the outcomes of SPADE has been a set of Core Documents (CDs), an object model thereof explicating data requirements, and a process-centric gap analysis of the ISO11783-10 machine-to-FMIS communications standard. The CDs have been defined with flexibility in mind, in view of the myriad ways in which different growers implement their record-keeping. The CDs are: Crop plan ("This is how we are going to grow this crop this season"), Observations and measurements ("This is what is happening out in the field"), Recommendation ("This is what I recommend we do about it"), Work order ("This is what we are going to do"), and Work record ("This is what we actually did"). The CDs are afforded context by Reference Data (i.e., a framework of data that can be shared across the industry; e.g., common product identifiers). Their exchange is further enabled by Setup Data, arguably another core document, that provides information needed to establish data exchange between a grower and their partners: a grower-farm-field tree, field boundaries, products used by the grower, machine settings, and so forth. The core documents can be related in complex ways (e.g., a Recommendation can inform a Work order.) The model represents these (causal, contextual, or compositional) relationships using a structure called DocumentCorrelation.

KEYWORDS: standards, software development, information systems, traceability, sustainability.

Student Status: No

First Time Attendee: No