

# Automating Regulatory Intelligence in Trade Management and Finance

## Embedded Regulatory Conformance and Supervision using the Data with Direction Specification (DWDS) for an Internet of Rules (IoR)

A network-oriented approach is now available to meet the trade management and finance industry's need for a transparent, risk-managed solution that simplifies and automates proactive regulatory conformance among transacting parties, and that also simplifies and automates supervision by internal control specialists and external authorities. This fills a gap that has been obstructing current-generation rules systems, markets and authorities.

The Data With Direction Specification (DWDS) enables consistent expression and execution of public regulatory and private contractual rules among existing and emerging applications, databases, platforms, and workflows, without interfering in their internal operations, or disrupting ongoing workflows. It becomes feasible to embed regulatory conformance and supervision consistently among diverse legacy and emergent trade management and finance systems and platforms, throughout your value chain. During any live transaction, your own systems become capable of using metadata to fetch rules from the network that are 'in effect' for a context, and 'applicable' to the industry and product/service categories. Then, locally under exclusive corporate control, your own applications can use circumstantial data to sift among Input Conditions in order to obtain the specific Output Assertions which are deemed to be 'invoked'. This enables real-time clause-by-clause execution of smart contract terms, triggered by live transaction event data (e.g. from electronic Bills of Lading, or Letters of Credit), standardized through bodies such as UNIDROIT, FIT Alliance (ICC, SWIFT, BIMCO, DSCA, FIATA), UNCITRAL, UN/CEFACT, ISO, OASIS, and national payments or securities regulators. DWDS is designed to function in combination with a wide range of data storage systems, traditional and non-traditional (SQL and NoSQL databases, as well as recursive linear "blockchains"; binary-branched "Merkle trees"; non-linear one-way "Directed Acyclic Graph (DAG)" paths; and key-value pair "Distributed Hash Table (DHT)" maps).

The DWDS system involves three parts which can function with precision and resilience across a distributed organization for end-to-end rules management, conformance and supervision. Yet with wide proliferation, these elements would gradually foster the emergence of a genuine "Internet of Rules". To this end, Xalgorithms provides a production-class free/libre/open source licensed reference implementation software suite, built in SvelteJS (RuleMaker) and Rust (RuleReserve & RuleTaker), with comprehensive documentation. Implementing organizations are at liberty to employ or adapt our reference implementations directly, or to recode them in whole or in part, in any other language, for any platform. Xalgorithms Foundation maintains a roster of DWDS specialists offering training for your full internal autonomy and control, or for outsourcing to your preferred suppliers.

### *The Data With Direction Specification (DWDS)*



The main strength of this work is its simple, scalable method for the automation of rules in any natural language, in any script. It is jointly optimized for fast in-memory computing, as well as for rule comprehension by anyone.

*"One of the inherent constraints of conventional IF-THEN-ELSE programming of rules in procedural code is that their maintenance does not scale well. As rules evolve over time, the code becomes spaghetti-like. Instead the DWDS framework results in clean computable rules with a finite grammar of six syntactic elements (three for computing needs and 'point form' for humans) in the form of tabular data. The ongoing evolution of rules is easily accommodated, and expansion of a rule involves merely adding more columns or rows, or chaining discrete sub-rules. Graphical representation of rule logic is intrinsic to DWDS, which is meaningful and memorable to humans, and is also one of the hottest pursuits in generative AI."*

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