

Formula language progress, comparisons with Formula linkbase

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Extended abstract. XBRL Formula¹ provides for validation of business reports, such as those submitted to regulatory agencies. It was originally designed to exploit the XML syntax used for XBRL technologies by leveraging XLINK linkbases. Linkbases had been recently introduced when XBRL was designed, but they are not readable in the manner of ordinary software code. Specialized tools have been developed for projects and for the linkbase syntax. The difficult and low level nature of the syntax is perceived as a deterrent to wider use of XBRL Formula.

The benefits underlying XBRL Formula is that it is a first-order predicate language ideally suited to report validation. It has similar origins as SQL, in the ideas originally in the Prolog language. This technology maps well into validation of large sets of data with complex accounting and submission rules. SQL has survived for decades, it has a programming language kind of syntax.

In this project we undertake a simple task to migrate from a XLINK linkbase formula representation to a coding-based specification. One goal in this process is to preserve the logical expression syntax used in the linkbase representations in the syntactical manner of XQuery.

A limitation of the linkbase representation is that the expressions and specifications don't have the benefits of modularity and readability of syntax-based coding languages. We introduce this in the syntax-based language yet compile it into the XLINK linkbases consumed by current formula processors. The linkbase becomes like the assembly language produced by programming language compilers, and by keeping it as a compiler output, we preserve the investment in XBRL formula processors.

A second limitation of formula linkbases is that the collections of formulas need to be managed, controlling which ones run based on the nature of the business report and the outcome of sets of formulas. With the syntax we support a parallel development, assertion sets for control of formula processing.

Example formula language converters and translators have been provided by the open source community as modularity features are developed.

¹ For an overview and specifications please see: <https://specifications.xbrl.org/work-product-index-formula-formula-1.0.html>

2 Formula language progress, comparisons with Formula linkbase

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