Quark XML DB Infrastructure

The Quark XML DB Infrastructure is the XML specific component of Quark. It implements the XML data model to store XML data. This component consists of various components to store and process XML data.

The major components of the XML DB Infrastructure are:

- **XML Data Model Infrastructure**: This is the implementation of the XML data model in Quark. It implements the XML data model that conforms to W3C Specifications. The XML data model implementation is divided into the following libraries:
  - **Core XQuery data model infrastructure**: This is the abstract representation of the XQuery data model. It contains entities like Sequences, Items, Nodes and Atomic Values. It also contains the XML types such as Strings, Numerics, Date/Time, AnyAtomicTypes, UntypedAtomics, etc. It also has the abstract data model factory for creating XQuery data model entities that will be used throughout the XML DB Infrastructure of Quark. It also contains the implementation of the XQuery functions as specified in the W3C Specifications.
  - **Main memory core data model implementation**: This is the main memory implementation of the core XQuery data model infrastructure. It contains the concrete implementation of the XQuery data model entities along with the concrete factory for creating XQuery data model entities.
  - **Extended XQuery data model infrastructure**: This contains the extended set of functions supported by Quark that are not part of the W3C XQuery specification, along with a factory for creating instances of these functions.

- **XQuery & TeXQuery Parser**: This is the parser that converts XQuery and TeXQuery queries into an AST, and then converts the AST to a YQGM graph. It contains the AST nodes that represent the XQuery along with the lexer and parser files which contain the XQuery grammar.

- **XQuery YQGM**: This is the extension to the standard YQGM components that handle XML specific functions. These include Expression functions to wrap the XQuery functions and Expression Constants to wrap XQuery model items so that they can be used in the Expression trees in YQGM operators.

- **XQuery Rewriter**: This component contains the specific rewrite rules required for simplifying the YQGM graphs. It contains specific YQGM rules for simplifying Unnest operators and other operators depending on the XQuery context.
functions whose output they are unnesting, and the Navigation Function Removal Rule (which removes XML navigation functions that are unnecessarily after the query).
Component Dependency Graph

Components marked in red are part of the Quark DB Infrastructure while those in green are part of the Quark XML DB Infrastructure.