

SQL/PGQ & GQL STATUS

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Introduction

- Brief History of the SQL Standards
- ISO/IEC JTC1 process and structure
- How does SQL/PGQ and GQL fit in this structure?
- SQL/PGQ and GQL status and timing
- Summary

SQL Standards – a brief history

- ISO/IEC 9075 Database Language SQL
 - SQL-87 – Transactions, Create, Read, Update, Delete
 - SQL-89 – Referential Integrity
 - SQL-92 – Internationalization, etc.
 - SQL:1999 – User Defined Types
 - SQL:2003 – XML
 - SQL:2008 – Expansions and corrections
 - SQL:2011 – Temporal
 - SQL:2016 – JSON, RPR, PTF, MDA (2019)
- 30 years of support and expansion of the standard

SQL:2016 Major Features

- Row Pattern Recognition
 - Regular Expressions across sequences of rows
- Support for Java Script Object Notation (JSON) objects
 - Store, Query, and Retrieve JSON objects
- Polymorphic Table Functions
 - parameters and function return value can be tables whose shape is not known until compile time
- Additional analytics
 - Trigonometric and Logarithm functions
- Multi-dimensional Arrays (2019)

SQL:2016 Parts

Reference	Document title
ISO/IEC 9075-1	Information technology -- Database languages -- SQL -- Part 1: Framework (SQL/Framework)
ISO/IEC 9075-2	Information technology -- Database languages -- SQL -- Part 2: Foundation (SQL/Foundation)
ISO/IEC 9075-3	Information technology -- Database languages -- SQL -- Part 3: Call-Level Interface (SQL/CLI)
ISO/IEC 9075-4	Information technology -- Database languages -- SQL -- Part 4: Persistent stored modules (SQL/PSM)
ISO/IEC 9075-9	Information technology -- Database languages -- SQL -- Part 9: Management of External Data (SQL/MED)
ISO/IEC 9075-10	Information technology -- Database languages -- SQL -- Part 10: Object language bindings (SQL/OLB)
ISO/IEC 9075-11	Information technology -- Database languages -- SQL -- Part 11: Information and definition schemas (SQL/Schemata)
ISO/IEC 9075-13	Information technology -- Database languages -- SQL -- Part 13: SQL Routines and types using the Java programming language (SQL/JRT)
ISO/IEC 9075-14	Information technology -- Database languages -- SQL -- Part 14: XML-Related Specifications (SQL/XML)
ISO/IEC 9075-15	Information technology -- Database languages -- SQL -- Part 15: Multi-dimensional Arrays (SQL/MDA) (2019)

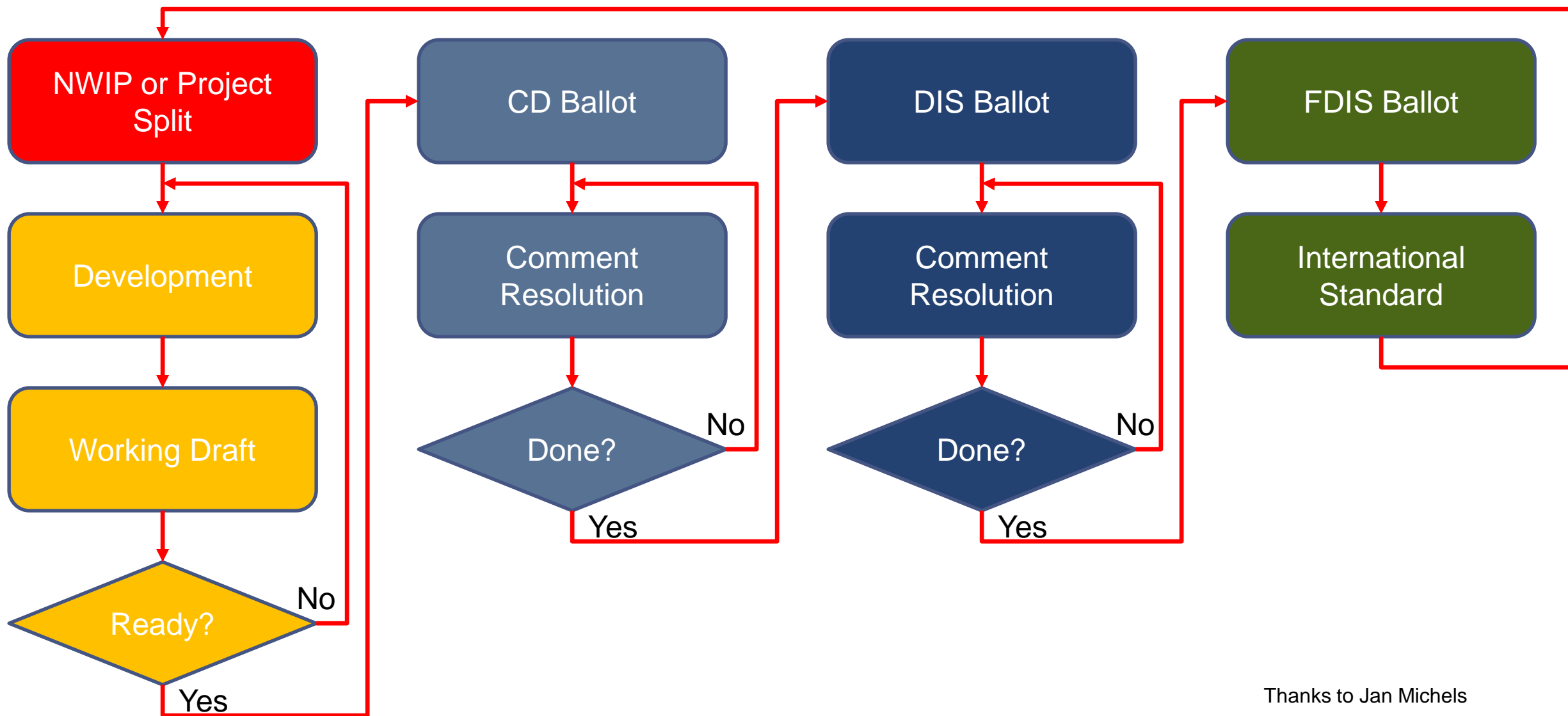
SQL Technical Reports – 19075

- SQL Standards committees have accumulated a great deal of descriptive material
- Useful information (non-normative) but does not belong in the actual standard.
- Started creating Technical Reports from this material
 - First was published in 2011
 - Total of seven are now published
 - Eighth will be published soon
- Available from JTC1 Freely Available Standards page:
 - <http://standards.iso.org/ittf/PubliclyAvailableStandards/index.html>
 - Search for 19075
 - Must agree to single use license
- The current list of Technical Reports is:

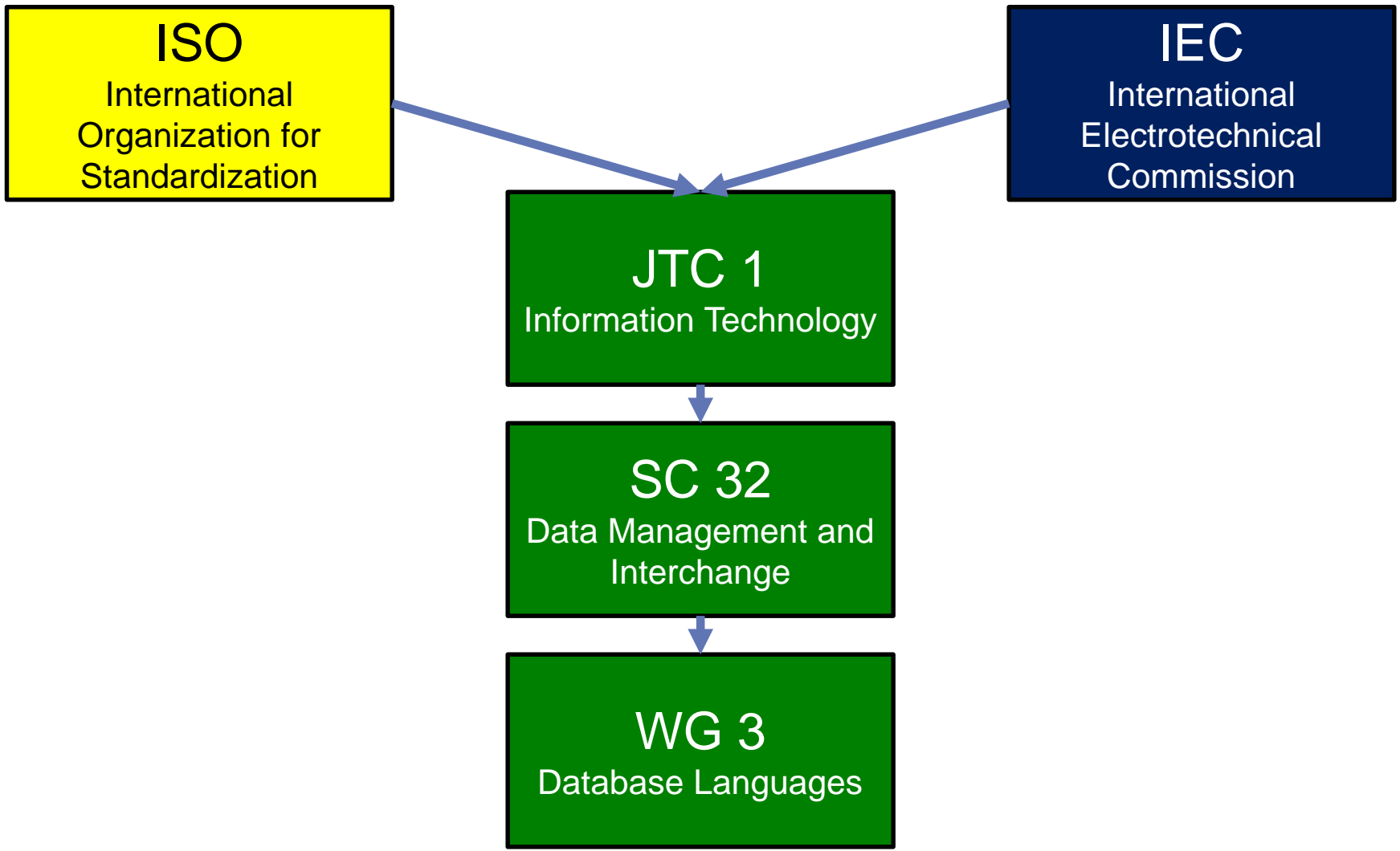
SQL Technical Reports

Reference	Document title	Publication Date
ISO/IEC TR 19075-1	Information technology -- Database languages -- SQL Technical Reports -- Part 1: XQuery Regular Expression Support in SQL	2011-07-06
ISO/IEC TR 19075-2	Information technology -- Database languages -- SQL Technical Reports -- Part 2: SQL Support for Time-Related Information	2015-07-01
ISO/IEC TR 19075-3	Information technology -- Database languages -- SQL Technical Reports -- Part 3: SQL Embedded in Programs using the Java™ programming language	2015-07-01
ISO/IEC TR 19075-4	Information technology -- Database languages -- SQL Technical Reports -- Part 4: SQL with Routines and types using the Java™ programming language	2015-07-01
ISO/IEC TR 19075-5	Information technology -- Database languages -- SQL Technical Reports -- Part 5: Row Pattern Recognition in SQL	2016-12-14
ISO/IEC TR 19075-6	Information technology -- Database languages -- SQL Technical Reports -- Part 6: SQL support for JSON	2017-03-29
ISO/IEC TR 19075-7	Information technology -- Database languages -- SQL Technical Reports - Part 7: SQL Support for Polymorphic Table Functions	2017-03-29
ISO/IEC TR 19075-8	Information technology -- Database languages -- SQL Technical Reports -- Part 8: SQL Support for multi dimensional arrays	2019

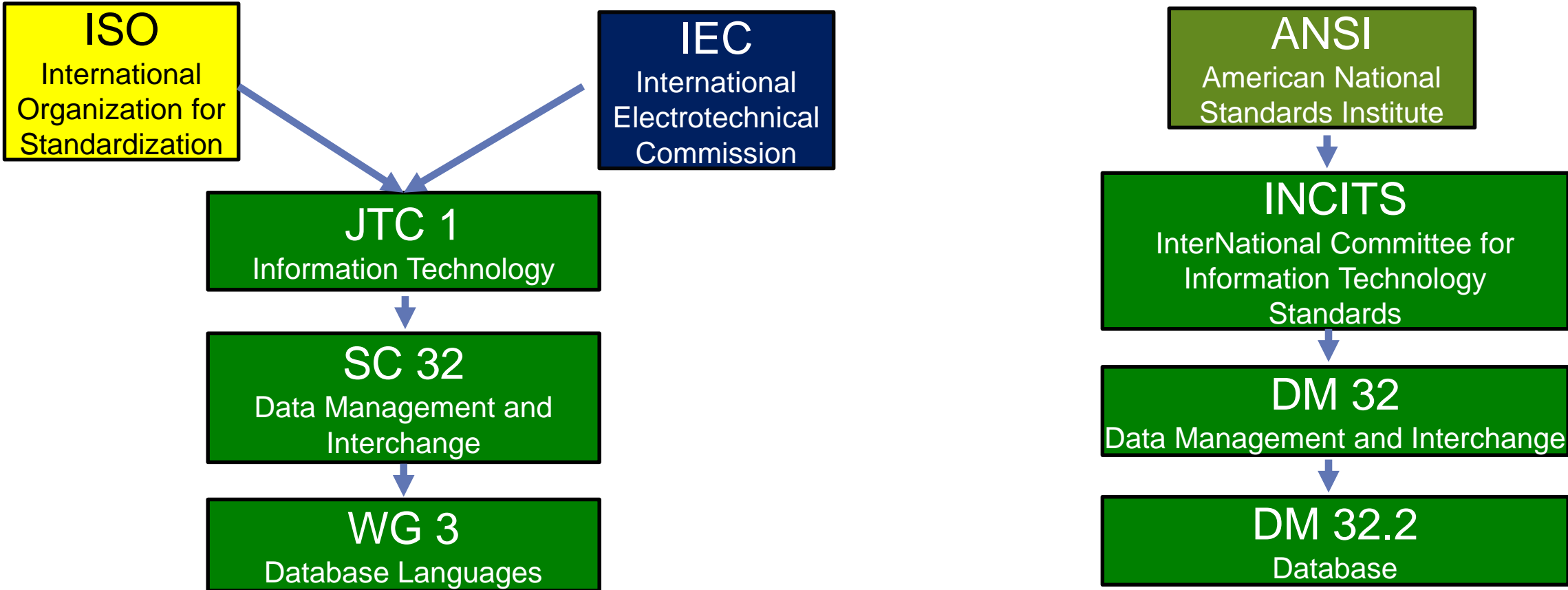
ISO/IEC JTC1 Standardization Process



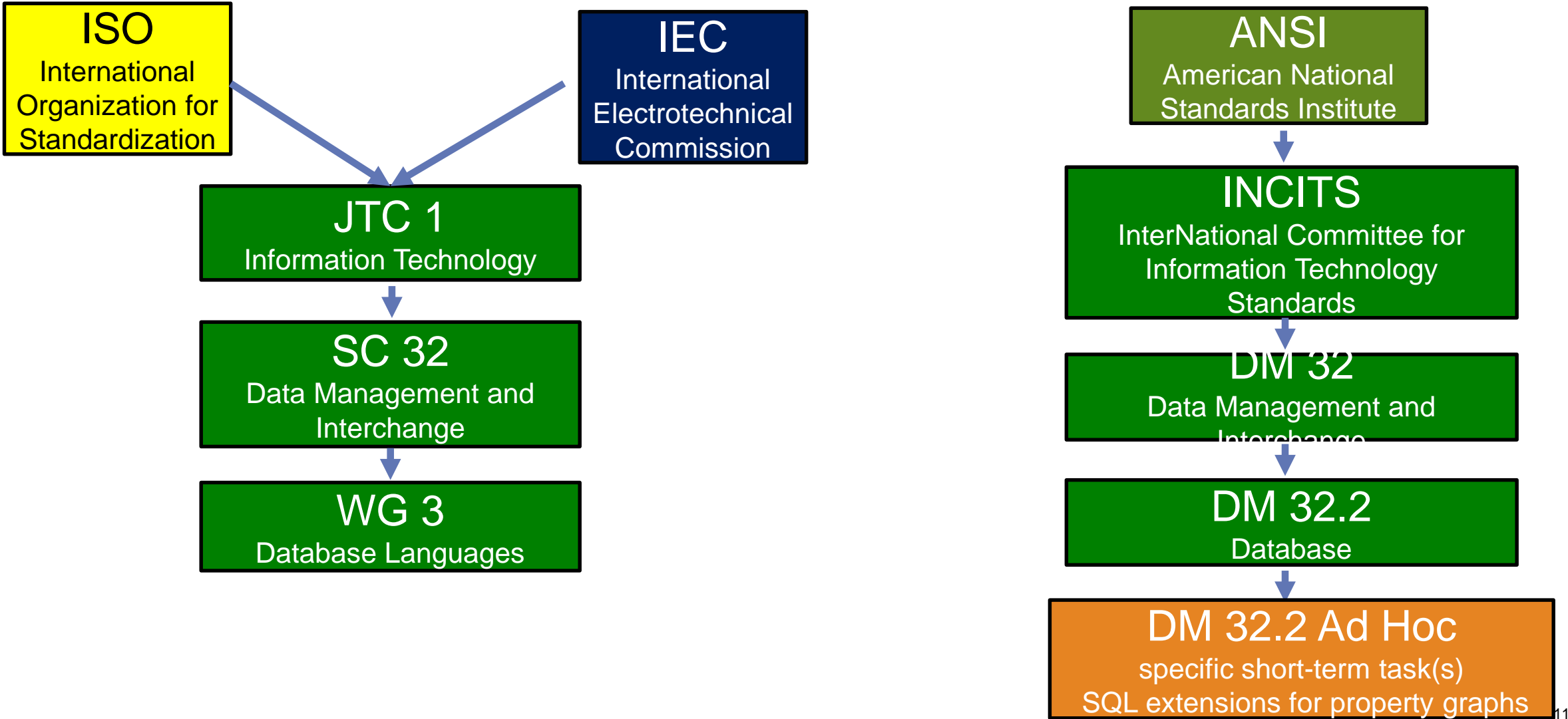
International Standards Hierarchy



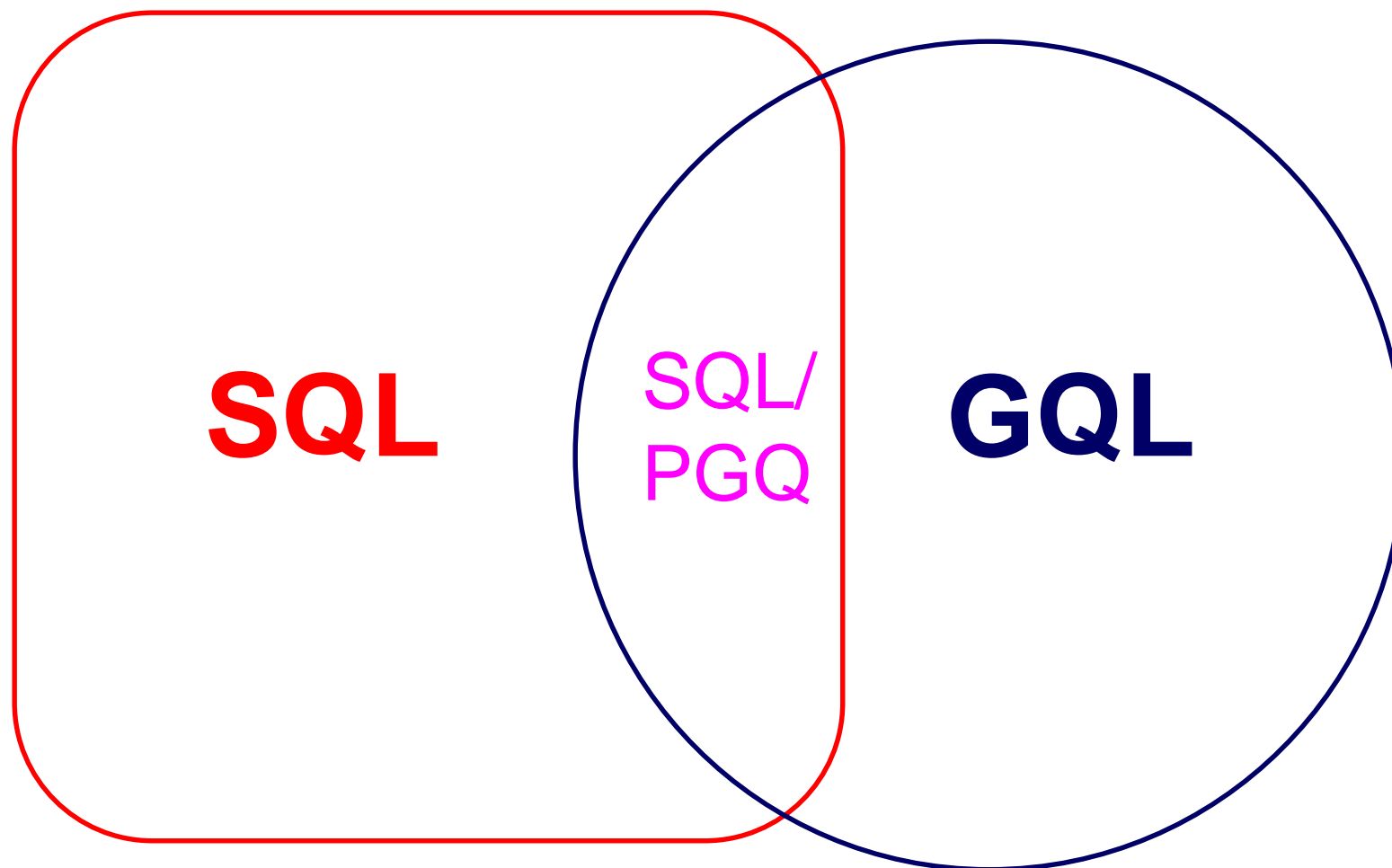
International Standards Hierarchy mirrored in the US



International Standards Hierarchy mirrored in the US

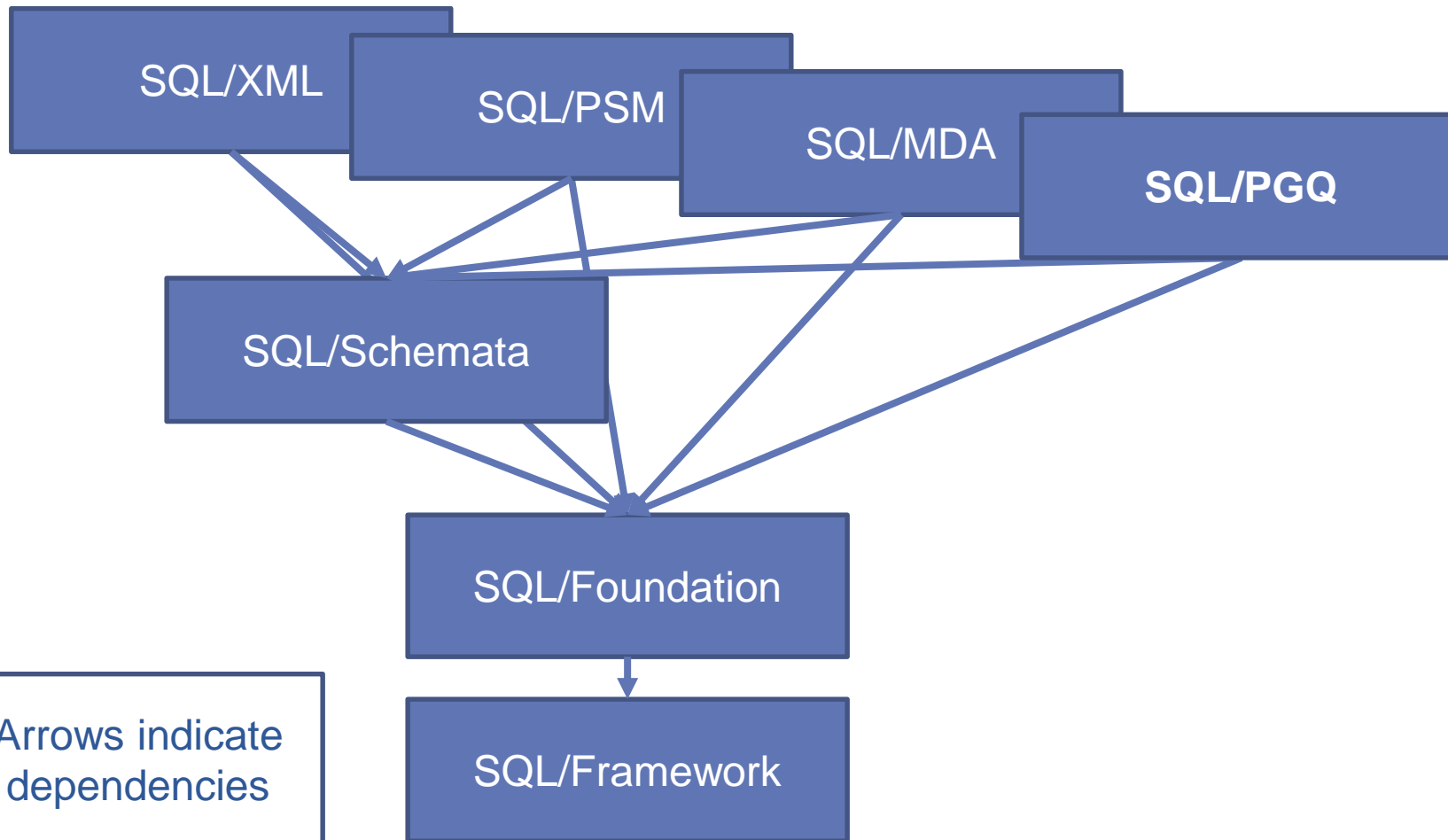


SQL, SQL/PGQ, and GQL

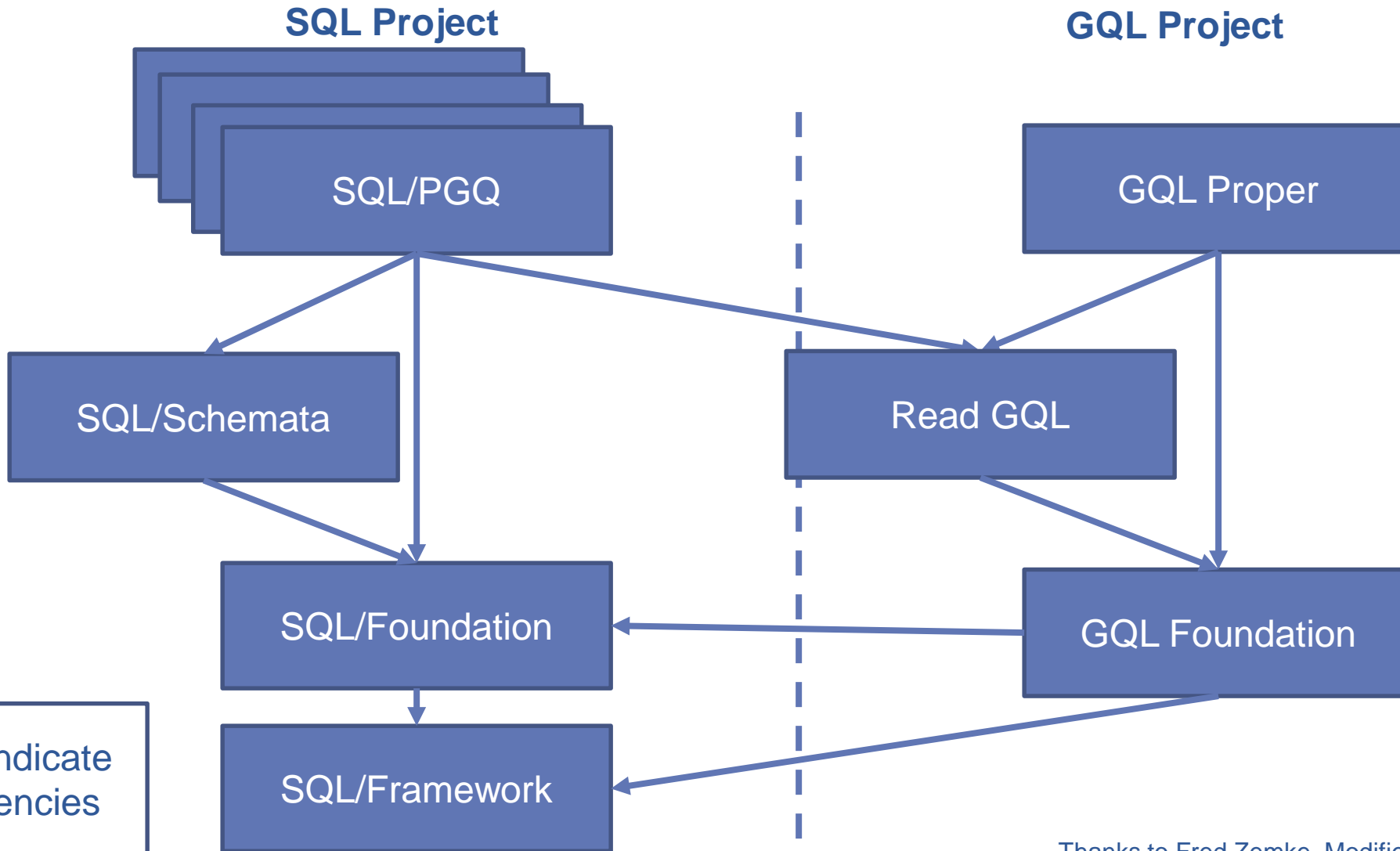


SQL and SQL/PGQ

SQL Project



SQL and GQL Projects



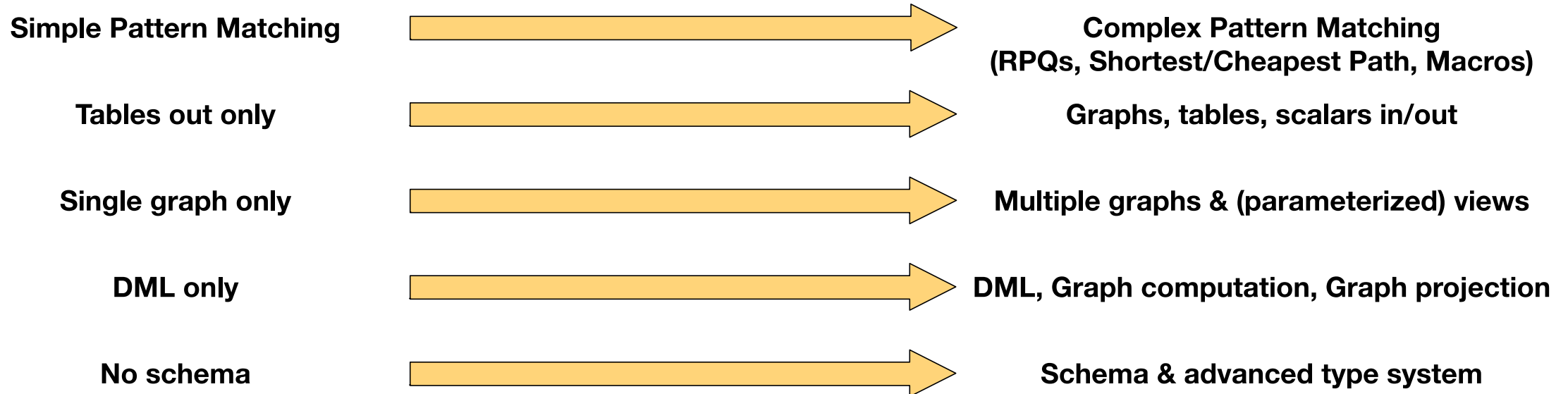
SQL/PGQ Status

- Project Split exists – 9075-16 SQL/PGQ
 - 48 month project (maximum)
 - Timer starts when we have a working draft – June 2019
- Informal Working Draft exists
- Some detailed content exists
- More detailed content needed
- Potential Timeframe?

GQL Status

- New project – Need New Work Item Proposal (NWIP)
 - Submitted by national body (USA) to SC32
 - Probably vote after June 2019 SC32 plenary
 - 48 Month project (maximum)
 - Timer starts when NWIP approved
- Outline of Working Draft exists
- List of potential Content exists
- Potential Timeframe?

From Cypher, PGQL, GSQL, SQL/PGQ to GQL



All aligned with basic data types, infrastructure, and expressions of the SQL database

Support for basic tabular manipulation (projection, sorting, grouping etc)

<http://tiny.cc/gql-scope-and-features>

Summary

- Momentum is building to make this happen

Questions?

```
SELECT * FROM Graph
GRAPH_TABLE (
MATCH(who:AudienceMember)
-[has:Questions]
->(for:Speaker)
COLUMNS who.name AS audience,
          who.question AS question,
          for.name as speaker );
```