#ntk19

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Fun with Legal Information in Microsoft SQL Server:
Correlating Offers and Counter-offers

Speaker Introduction

Matija Lah

- Lawyer
- SolidQ CEE, Mentor
- Microsoft MVP (Data Platform), Since 2007
- 16+ years of SQL Server experience
  - Specializing in Legal Information Management and Natural Language Processing
- Current focus areas
  - Database Engine
  - Integration Services
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Agenda

Contractual Law Essentials
(Sale of Goods)

The Offer

Matching Offers and Counter-offers

What‘s Available in SQL Server

Laws and Contracts

Laws

Define the rules imperatively,
erga omnes

Contracts

Define the rules autonomously,
inter partes

Norm (legal rule)

Obligation to either do, not do, or allow something to be done

Contract

Agreement between two (or more) parties to *do*, *not do*, or *allow* something to be done

Typically, *mutual* – one party promises to do* in return for the other party to do*

- E.g.: *sale of goods*
  - The seller agrees to deliver goods to the buyer in return for payment
  - The buyer agrees to pay for the goods in return for receiving (allowing the seller to deliver) them

Sale of Goods

Defined by law of individual countries
(to be used in those countries)

Defined by international conventions
(to be used internationally*)

E.g. United Nations Convention on Contracts for the International Sale of Goods
(CISG, the Vienna Convention)

Both define the principal rules for the sale of goods

The parties of a specific contract can define additional, more specific rules, and must determine the essentials
(which must be set in accordance with law/convention)

What Makes a CISG Sales Contract?

One subject identified as the **seller**

One subject identified as the **buyer**

Goods determined
(Class, Quality, Quantity, and Price*)

Both subjects indicate **intent to be bound** by the contract

Intent must be explicit, except in certain specific situations

Both subjects **agree to use CISG**

All of the above determined **at the same time**

The Offer

First step towards the contract

„One half“ of the contract

The *seller* offers to *deliver goods* of a certain class/quality/quantity at a certain *price* at a certain *time*

The offer is accepted, if the *buyer* offers to *receive* the *specified goods* at the *specified price* at the *specified time*

Once the offer is accepted, the contract is established

Offer to sell must be *correlated* with offer to buy

Unless …

… the law says otherwise.

Determining Entities and Attributes

Distinguish between sellers and buyers
(also: make sure they agree to use CISG)

- Seller and buyer must not be the same person

Goods

- Class, Quality, Quantity, Price
  (measurable properties with appropriate measuring units)

Temporal properties

- Offer validity is a closed, or open-ended interval

Offers and contracts

- An offer can be accepted, if it correlates with one or more counter-offers
- A one-time offer cannot be accepted more than once

Determining Correlation (Logically)

- The offer and the counter-offer are valid at the same time
  - Measuring time in international trade
    - If time is *specified*, ±2 days
    - If time is *not specified*, immediately
    - Immediately = within 8 days
- The set of goods offered by the seller *is equal to* the set demanded by the buyer
  - The same class of goods of the same quality, quantity and price

Determining Correlation (Physically)

Seller or buyer?

- Separate sets of tables

The offer and the counter-offer are valid at the same time

- Temporal predicates for intervals

The set of goods offered by the seller is the set demanded by the buyer

- Relational division

One-time vs. continuous offers

- Contract (the result of correlating exactly two offers) is a separate entity*

Demo

Correlating Offers and Counter-offers

Conclusion (SQL Server Capabilities)

Temporal predicates

- No support for application-controlled temporal data
- Temporal predicates support literal values or variables

Relational division

- No native query construct
- `GROUP BY…HAVING…COUNT()`
- Columnstore indexes
  (https://docs.microsoft.com/en-us/sql/relational-databases/indexes/columnstore-indexes-overview)
  - Batch mode retrieval with segment elimination
  - Aggregate pushdown, and local aggregates

Further Reading

Dejan Sarka
Working With Temporal Data in SQL Server
(https://www.pluralsight.com/courses/working-with-temporal-data-sql-server)

Joe Celko
Divided We Stand: The SQL of Relational Division
(https://www.simple-talk.com/sql/t-sql-programming/divided-we-stand-the-sql-of-relational-division/)

Dwain Camps
High Performance Relational Division in SQL Server
(https://www.simple-talk.com/sql/learn-sql-server/high-performance-relational-division-in-sql-server/)

Niko Neugebauer
Columnstore
(http://www.nikoport.com/columnstore/)

Homework

Implement rules for determining dates used in international trade

Allow quantity to be specified as a range (interval)

Bonus

- Implement more efficient temporal predicates
- Compare different relational division techniques