A formalism is a tool to assist thinking. The formalism for information exploration provides:

• A systematic integration of querying and visualization.

• A foundation for analyzing information exploration environments.

• A controlled set of required capabilities against which an implementation can be organized.

• Concepts for designing new interfaces for querying and visualizing.

• Opportunities for extending existing visual query interfaces.

The transformation models are able to be extended unlimitedly in both the horizontal and vertical directions.

All entities in the query/visualization environment are tables:

• Data to be visualized, as relations,

• Visualized data, as a table of visual attributes,

• Visualization mappings, as tables, and

• Queries, as truth-tables.

A query is defined as a multi-dimensional item set, which can be visualized, as illustrated in Figure 2 and 3.

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A visual information exploration environment supports querying, selecting a part of the data for special attention, and for visualizing, seeing a visual presentation of the data. Research into visual query interfaces has two goals, making query creation easier, and better integrating the visualization interface with the query one.

This poster describes a formalism for information exploration, which equally captures querying and visualizing.

The core of the formalism is in Figure 1, which resembles those that appear in category theory. The important operations of information exploration are mappings: querying maps data items to Boolean values; visualizing maps data items to graphical icons.

Query results are visualized to reveal the relationship between data items and query fragments.

Recursive Models

The formalism defines applying tables to tables:

• querying a query,

• visualizing a visualization,

• querying a visualization, and so on.

Figure 7 not only shows the result of visualizing a visualization, but also gives a visualization for the mapping itself.

Figure 8 presents querying on queries by specifying query terms on the query space, which allows reducing the complexity of query formulation and help users understand complex queries.

Benefits of the Formalism

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