Introduction of Intelligent Broker between User and Search Engine for Patent Retrieval from Internet

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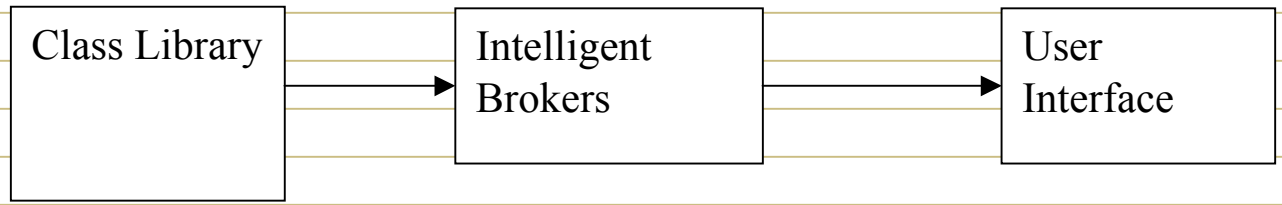
Issues Related to Searching Internet

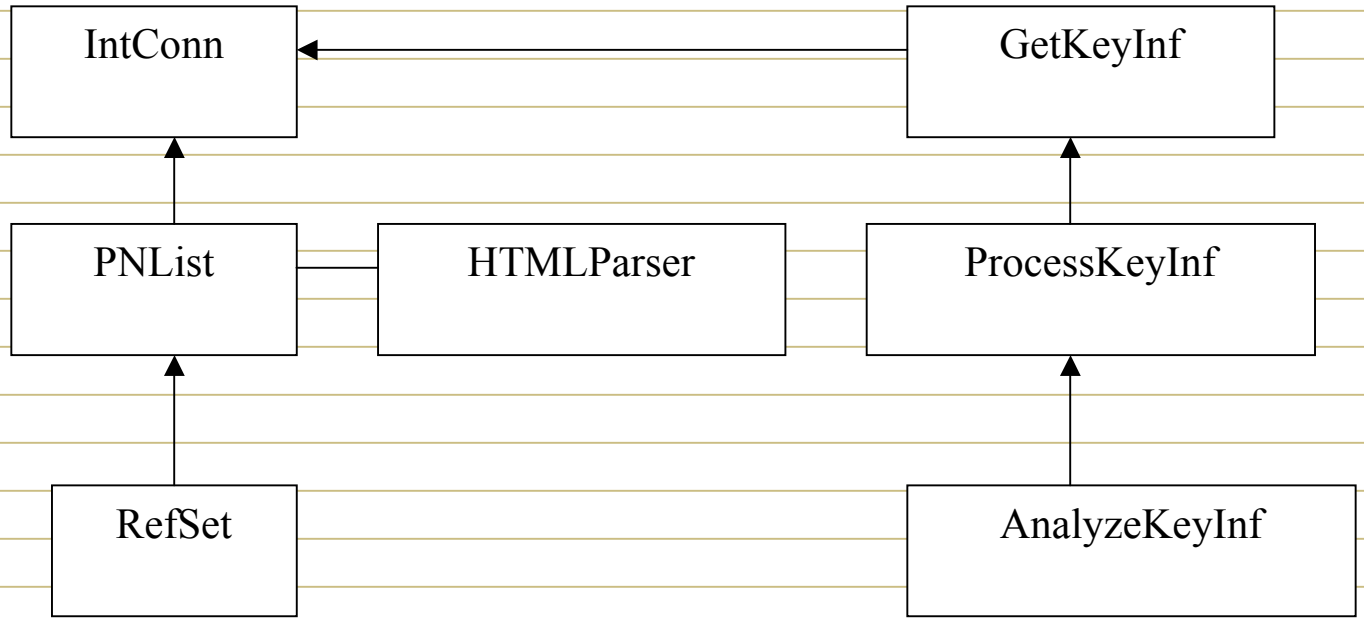
- keyword search
  - –context, synonym, different format of a word
- analysis leading to grouping and categorization
- programming repeating search path
- customizing presentation of search result

Introduction of Intelligent Broker Architecture

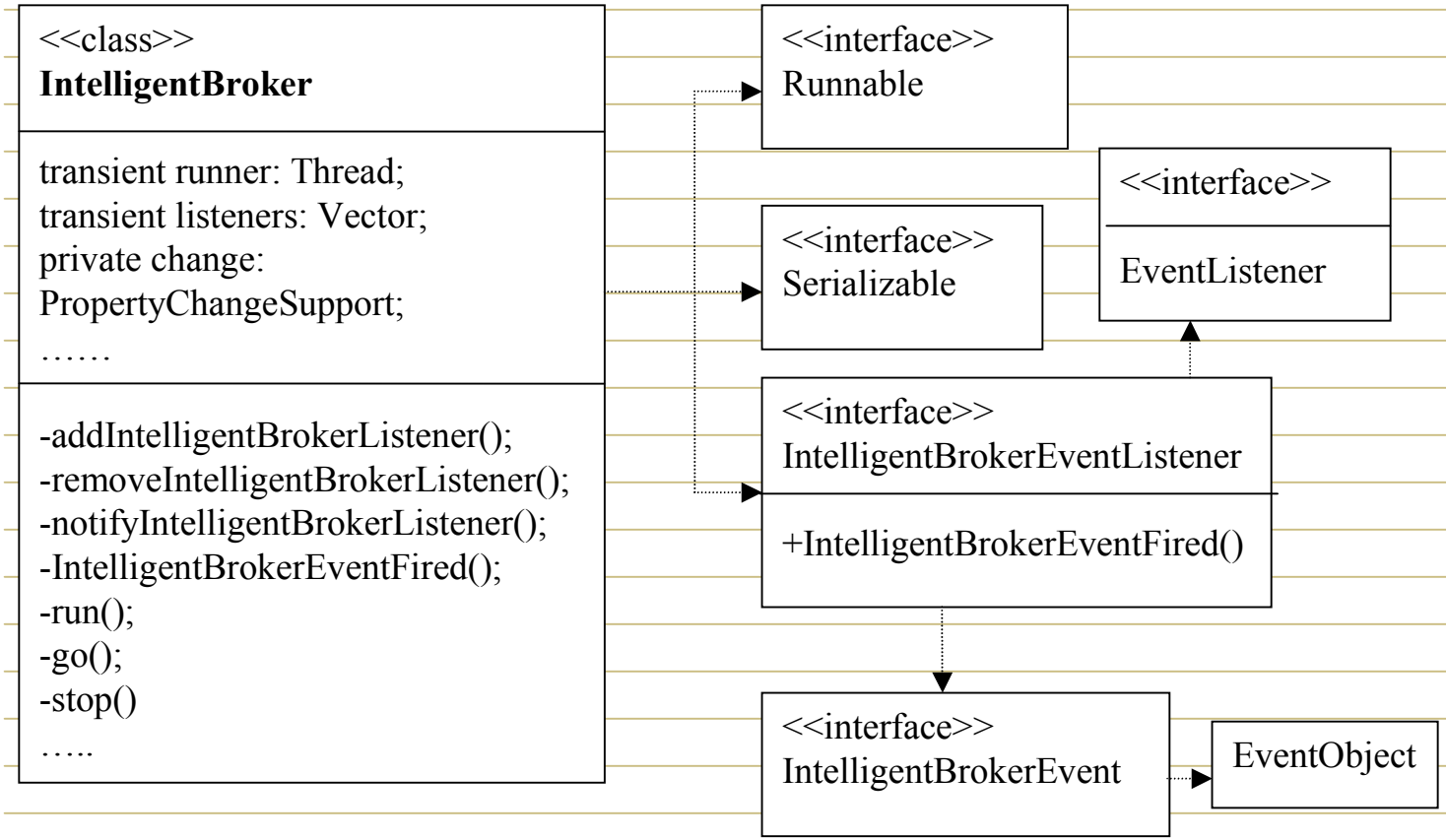


Model-View-Controller Model

Class Library



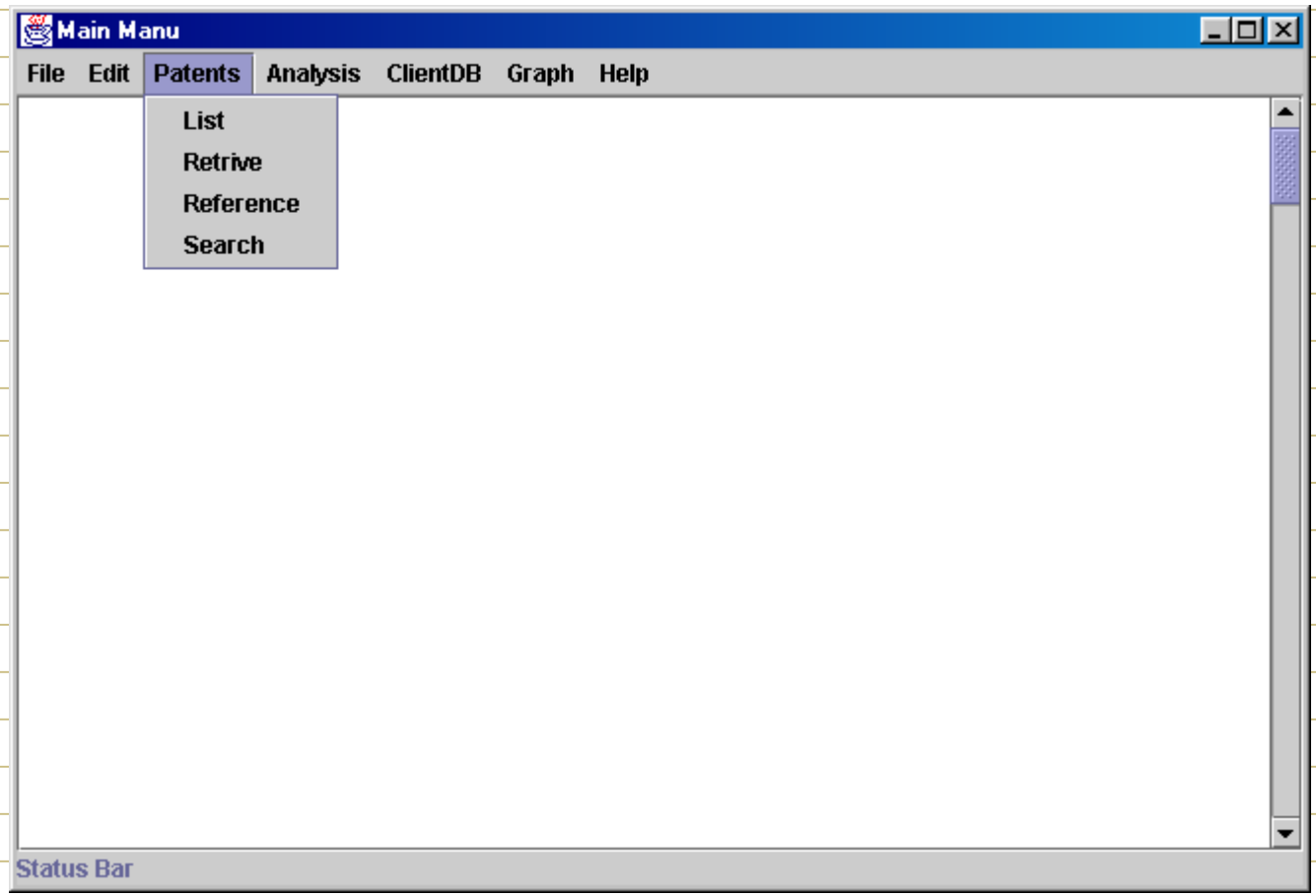
Intelligent Broker



Characteristics of Intelligent Broker

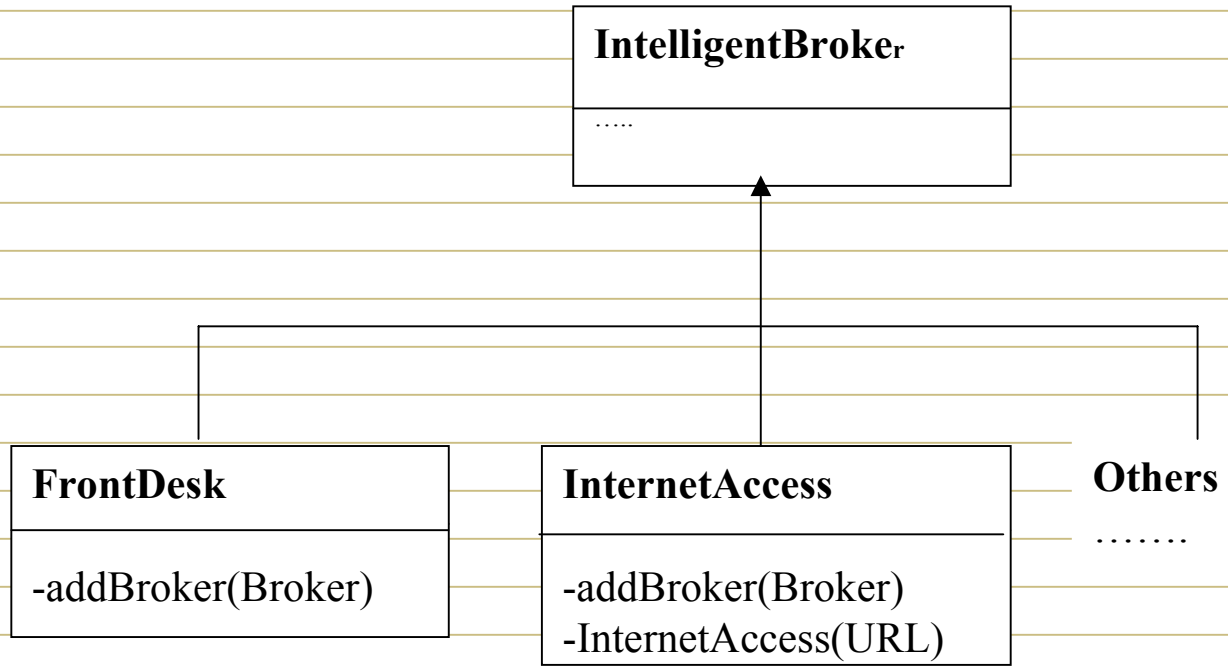
- JavaBeans Compliance
  - name convention
  - serializable
  - delegation event model
  - PropertyChangeSupport
- Thread and synchronized

User Interface



Application

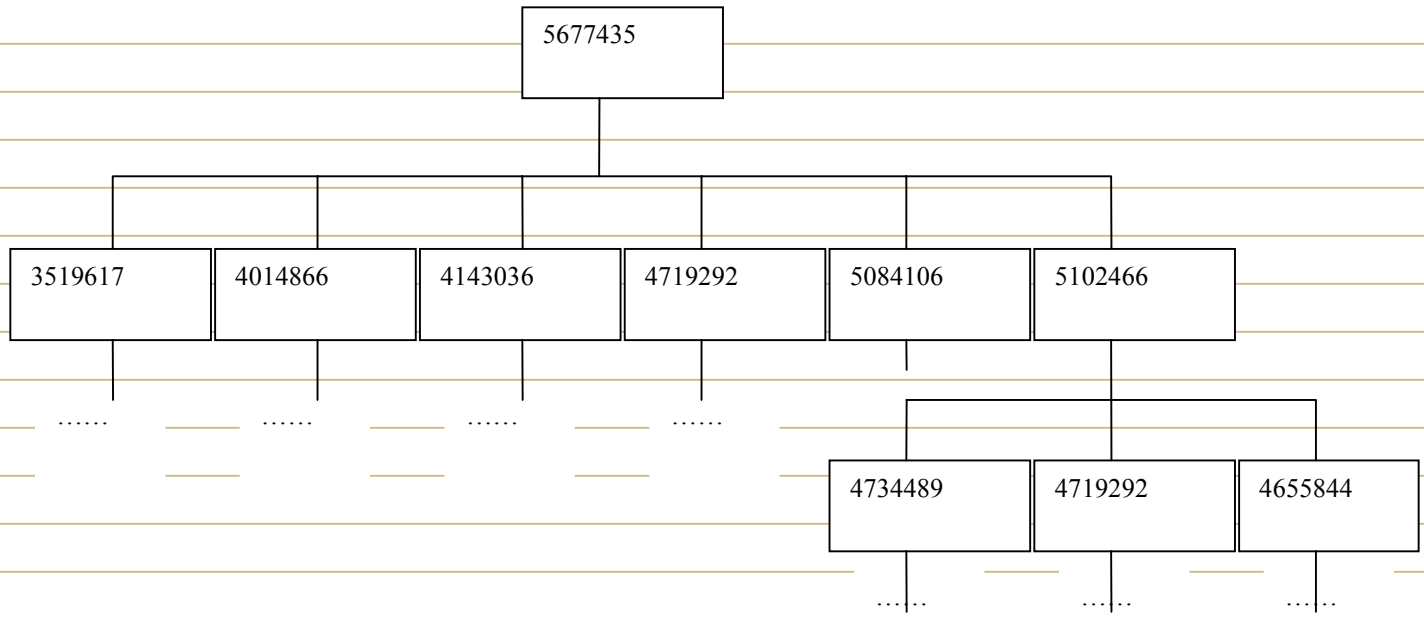
- Patent Search



AI Strategies

- Reference Search
- Keyword Search
- Analysis

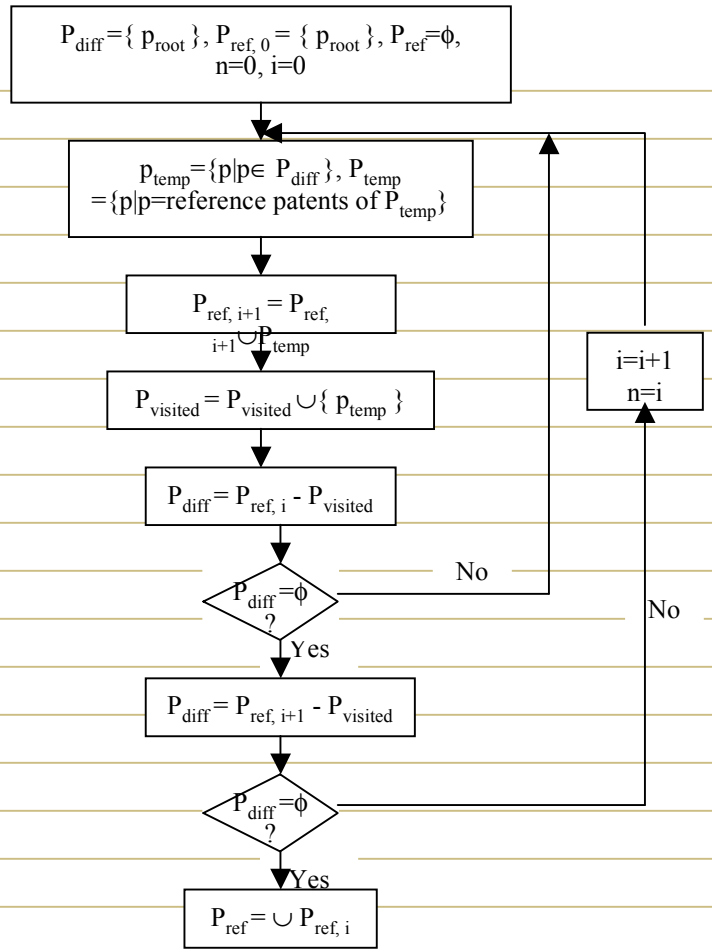
Reference Relationship



A Tree of Patent References of patent 5677435

It requires a special search algorithm.

Reference Search



Reference Search Algorithm

Constrained Reference Search

- Forward and Backward search control
- Depth control
- Field value constraints
- Counting quotation number

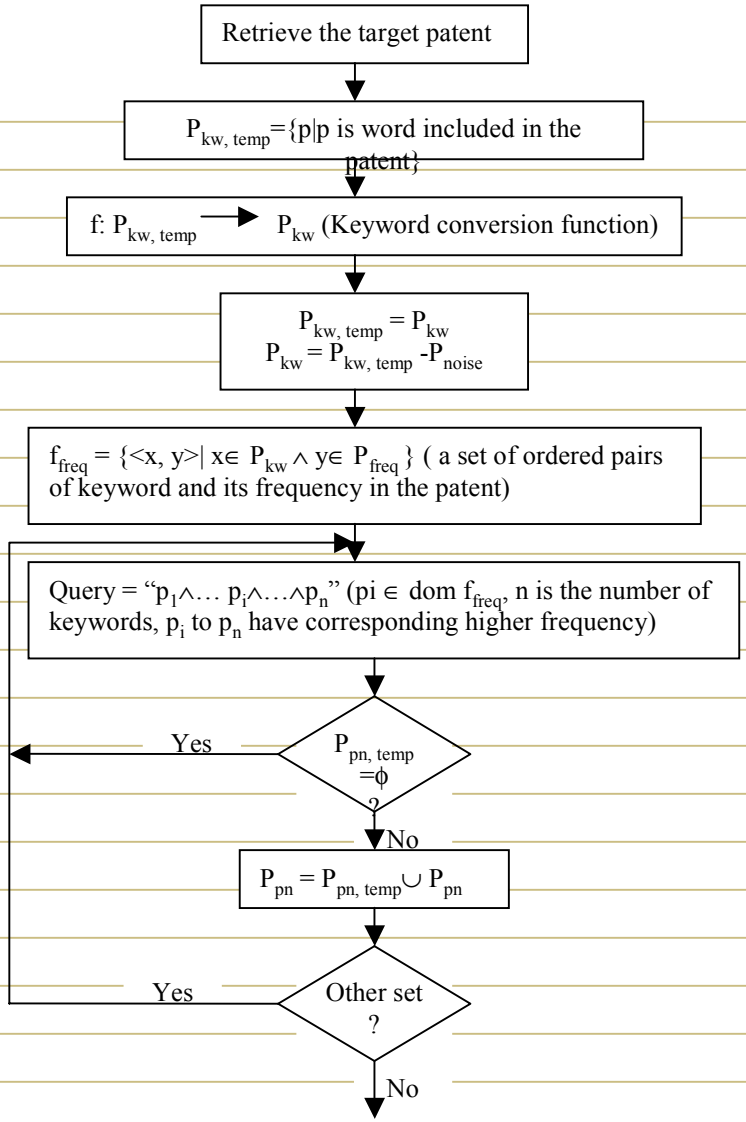
Criteria for Qualified Keyword

- not too highly frequent occurrence (thus article, conjunctive, preposition etc., must be eliminated.)
- high frequency
- within domain knowledge

Features of New Keyword Search

- Keyword originates from the root patent/article.
- Filtering and conversion.
- Build a set of qualified keywords
- Count the frequency of keyword.
- Query is constructed with multiple qualified keywords and operator “and”.
- Multiple queries.

Keyword Search Algorithm



Analysis

- Calculate the matching-rate between the keyword sets from any two patents.
- Find the context of the seed word.
- Matching could take place in section by section.
- Substring-matching for two words is optional.
- Other field-matching.

Conclusion

The intelligent broker architecture, as an add-in layer between user and search engine, performs many tasks neither user nor search engine can do. Such tasks are building a set of qualified keywords, construction of multiple queries with multiple qualified keywords, analysis leading to grouping and categorization, and retrieval of a tree of reference patents.

The JavaBeans-base intelligent broker makes itself a reusable component.

It can be extended to the other information search on Internet.