



Delivering  
*Intelligent Business Solutions*  
To **World-Class Retailers**



## **Kneobase Search Engine Implementation White Paper**

**February 2007**

## FOLLOW-UP

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## 1. INTRODUCTION

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Search engines have been proliferating with the booming of the Internet such that, nowadays, they have become a basic and worldwide reference tool.

Anyone with enough sense to surf the web may gain access to information - on any topic - which would have made the envy of researchers only a few decades ago. With websites like Google, Yahoo ..., people have the opportunity to get hold of desired information with virtually no training on web-surfing. Unfortunately, that is not the case with enterprise business applications; and the standard scenario here is that one needs a minimum required amount of training and orientation.

Enter Soft Solutions and all this is about to take a turn for the better: We have introduced a Google-like search engine in the Version 6 generation of Soft Solutions applications, which allows users to easily navigate business solutions, and which endows our applications with an intuitive and natural-driven feel.

'Keep it natural', is the slogan Soft Solutions adopted through its new V6 architecture for delivering complete solutions to retail associations through:

- The Retail Collaboration Suite (ibs RFX, ibs DATASYNC, ibs RSX)
- The Retail Master Data Management (ibs REFERENTIAL)
- The Retail Business Suite (ibs DEALS, ibs ASSORTMENT, ibs SPACE PLANNING, ibs PRICING, ibs PROMOTIONS, ibs PRICE EXECUTION, ibs CATEGORY)
- The Retail Operations Suite
- The Retail Execution Suite (ibs SYSTEM, ibs WORKFLOW, ibs REPORTING, ibs INTEGRATION, ibs MULTI LANGUAGE)

Visit: [www.ibs-softsolutions.com](http://www.ibs-softsolutions.com) for more information

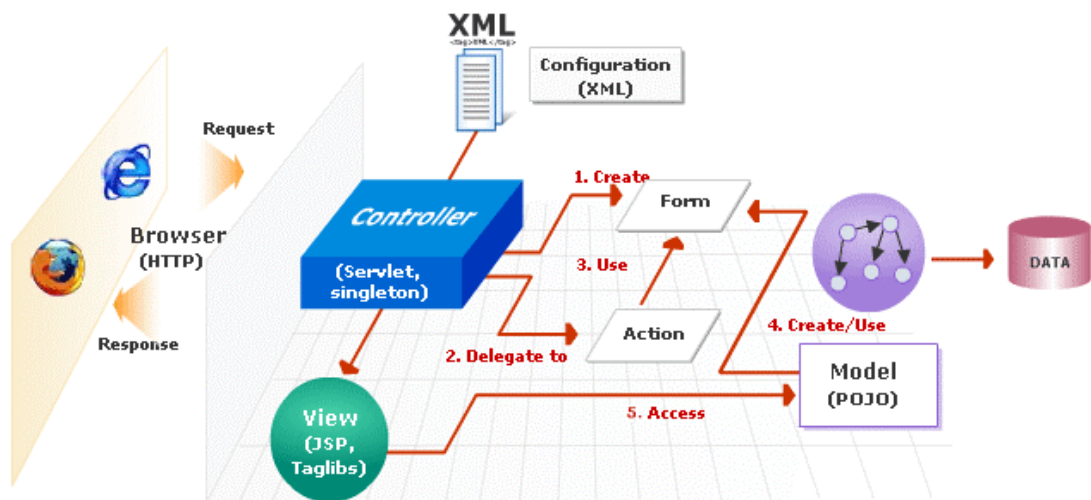
Soft Solutions adopted Kneobase search engine for many reasons that will be described in the document below.

## 2. WHY KNEOBASE?

In this section we will describe the reasons behind adopting Kneobase search engine.

### TECHNOLOGY

Soft Solutions Applications are multi-tier, multi-browser (Microsoft IE, Mozilla Firefox) web applications based on Model View Controller 2 using Struts as a framework. The core of their architecture is Spring; a full-stack Java/J2EE application framework, it delivers significant benefits to our applications and reduces development effort while improving test coverage and quality.

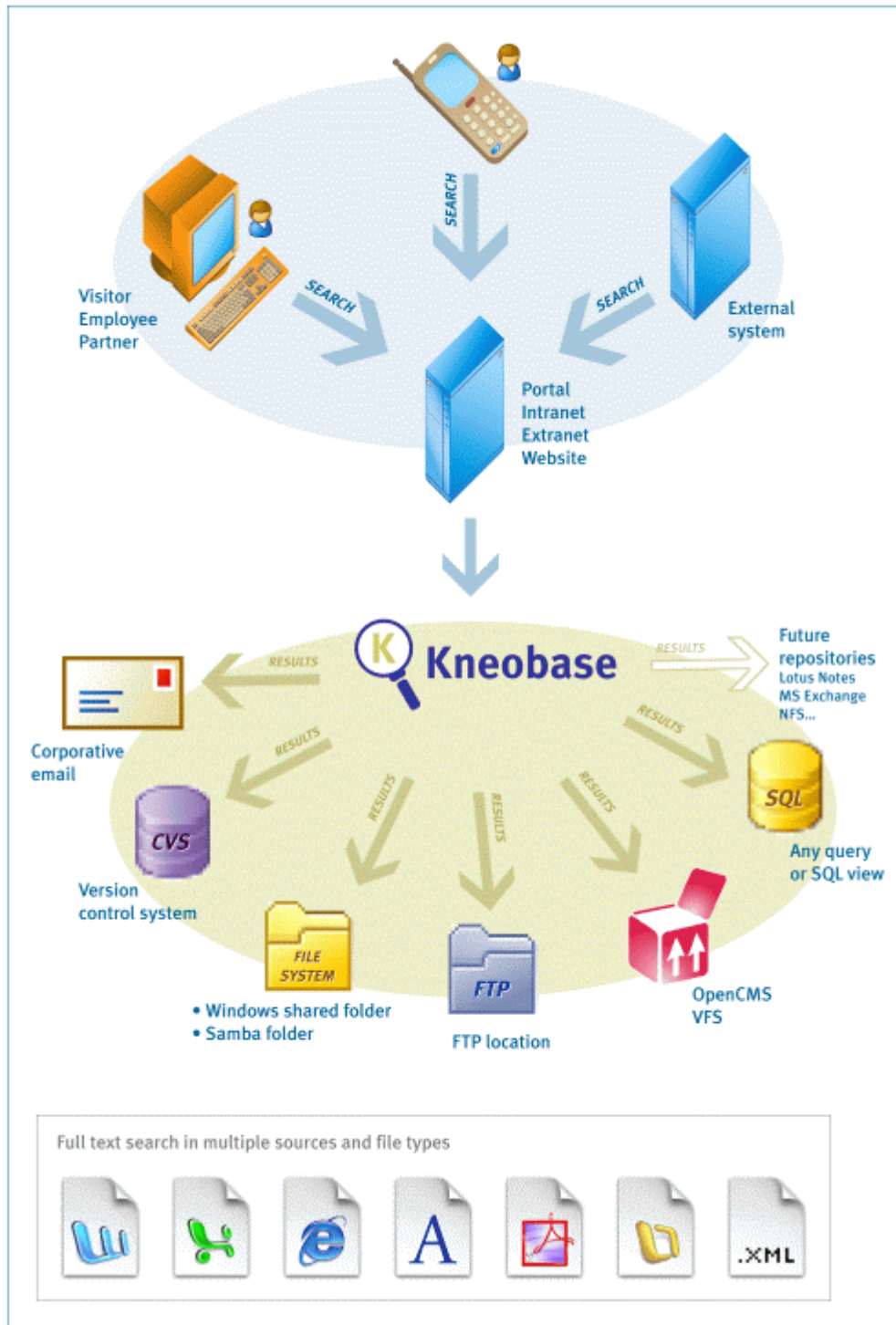


Kneobase search engine is based on Spring Framework, which is similar in implementation to our architecture, allowing an easy and homogeneous implementation into our suite.

Kneobase search engine can also be deployed under any JSP container, is compatible with JDBC driver and, thus, compliant with our technology.

### RDBMS SEARCH FEATURE

The major advantage of Kneobase search engine is the ability to index and search database tables by mapping through spring container XML files, giving us the ability to map our database from an external system.



The mapping to the database system is implemented through spring, which gives Kneobase a greater advantage over other search engines.

View section 3.1.1 for further details.

## **OTHER FEATURES**

Kneobase has other features that are of great interest to Soft Solutions:

- Multi language and automatic language detection
- Ability to search multiple data sources simultaneously
- Access to sources like documents, FTP, CVS.
- API with XML SOAP service allowing Kneobase to communicate through web services with Soft Solutions enterprise service bus.
- Open source: The ability to modify, customize and enhance the code to fit our needs.

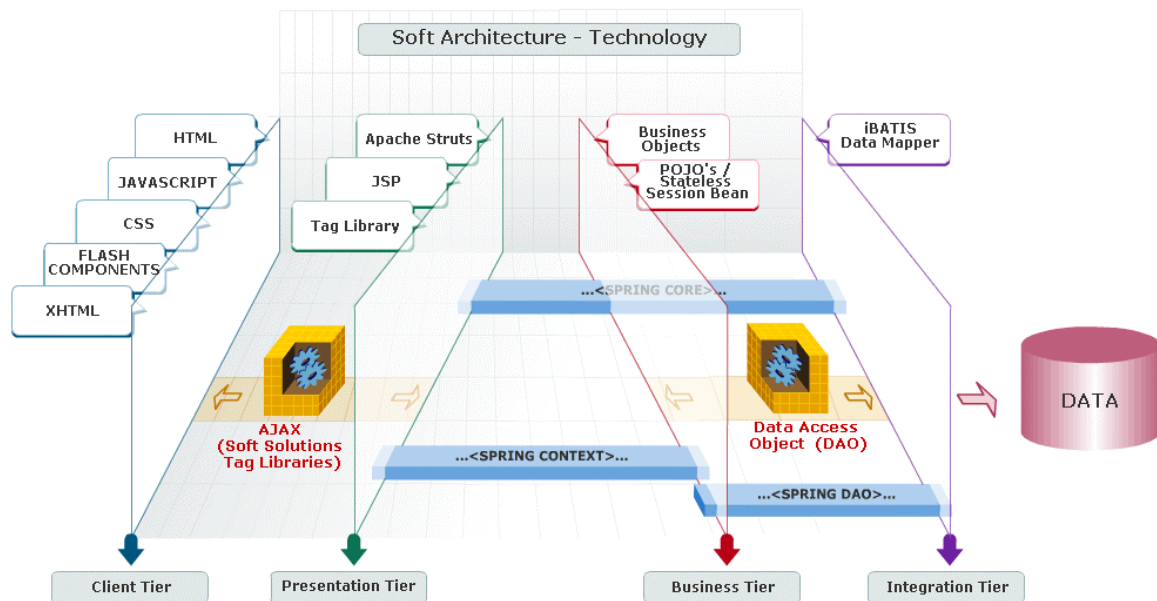
### 3. USE CASE

#### TECHNICAL IMPLEMENTATION

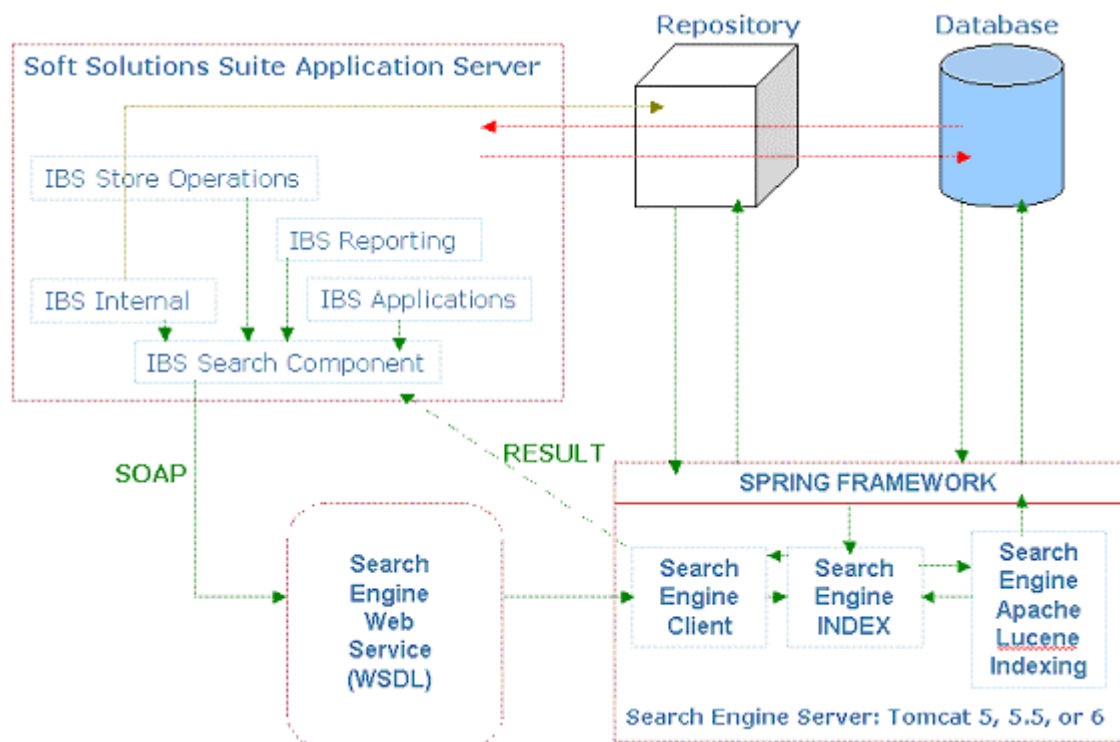
##### ARCHITECTURE

Soft Solutions communicates with Kneobase search engine using the XML SOAP API web service; therefore Kneobase could run on a different application server than the one for the suite.

The image below shows the Soft Solutions architecture:



The graph below describes the communication between our applications and the search engine.



## 4. PERFORMANCE TEST CASE RESULTS

### SEARCH RESULTS

The search engine performance results are good, we have tested indexing different tables in the database, containing a summation of 3 million records, and the search results were satisfactory: less than 1 sec.

Further testing will be conducted in this matter, especially simulating multiple-user search.

### INDEXING RESULTS

From the continuous test on the performance of the indexing of Kneobase, we have concluded that parallel indexing of resources is consuming much more time than simultaneous indexing; therefore the tables to be indexed should be sent to the indexing engine in a queue.

More research and investigation are being done to manipulate and test the multi-threading concept.

#### Parallel indexing Results

Tables # records#	1	10	50
10	< 5s	< 5s	20 s
50	~ 5s	< 7s	1 min
100	~ 5s	17 s	2 min
500	~ 7s	50 s	too slow
1000	7s + 12s	2:44 min	not tested
10000	1:15 + 1:30	more than 2 hrs to index 7000	not tested

#### Queue Indexing Results

Initial Nb of records	Time needed
1000	2 sec
10000	0 sec
10000	5 sec
10000	20 sec
100000	< 5 sec
100000	< 5 sec
100000	6 sec
100000	~ 1 min
100000	~ 11 min
500000	< 5 sec
500000	< 5 sec
500000	30 sec
500000	~ 5 min
500000	~ 55 min

From the above results we may conclude the following:

- The indexing does not affect the search capabilities in terms of performance and availability; therefore the administrator may run the search live without affecting user performance.
- Parallel indexing is not fast; queued indexing is much more efficient.
- Some tables cannot be indexed or updated live; they should be done at night or offline.
- When we delete records, updating the index is not possible (should be enhanced or corrected).
- Overall performance of the search engine was satisfactory and fits Soft Solutions requirements.

## 5. SUGGESTIONS FOR FUTURE UPDATES

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Soft Solutions has modified some features in the Kneobase code, which are:

- Fixing the update index while inserting or modifying records in a table
- Reading BLOB types with Oracle
- Unique configuration file for the database connection

On the other hand, we would suggest the following in the upcoming versions:

- Including database semantics
- Fixing the delete issue, possibility of updating the index when a record is deleted from a table

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