

Lightweight End-User Programming with Wikis

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Abstract

Wikis are online collaboration tools to share information amongst users. Today's wiki engines typically lack features to integrate structured data from backend databases. We have created a solution for integrating wiki technology with SAP structured data. Our solution will help provide a lightweight end-user programming environment for users to access complex structured data.

Categories and Subject Descriptors D.2.6 [Programming Environments]: Integrated Environments

General Terms Design.

Keywords Wikis, End-User Programming

1. Introduction

Most wiki [1] engine software that exists today has been designed for sharing information with other users either in a public or private domain. We are interested in integrating traditional prose-based wiki contents with structured data to enable users to collaborate around such structured data. Our long-term vision is to give wiki users the option to do lightweight end-user programming within the wiki. Such enhanced wikis are also known as application wikis.

2. Accessing Structured Data

The aim of the Wiki Business Object project is to allow users to write business queries from within a wiki. The results of the queries are structured data which are then displayed inside a wiki page.

The queries operate on structured data. A sales order is an example of structured data. A sales order is an order received by a business from a customer and contains a buyer party, seller party, and the items for sale.

Figure 1 shows the basic architecture of the software. Users view the MediaWiki [2] instance in their web browser. Users edit a wiki page through the edit mode and can then write business queries which are encapsulated inside XML like tags, e.g. `<bql>query string </bql>`.

When the MediaWiki engine parses the tags the PHP extension is called. The extension then takes the business query string as an argument and calls a Java SOAP web service executing on an Apache Tomcat [3] instance. The web service creates a Java Business Object Query and then calls the execute method on the Business Object Query engine inside of the SAP *Business By Design* system.

If the query is valid, a list of Java data objects is returned. If the query fails, an error message is returned. The web service then parses the data objects and creates structured JavaScript Object Notation (JSON) [4] objects. The JSON objects are then returned to the MediaWiki instance which is responsible for parsing and rendering the JSON objects into HTML.

Figure 2 shows creating a business query which gets all the Sales Orders items. Figure 3 shows the results of the query displayed as a table in wiki markup.

3. End-User Programming with Wikis

Querying and writing back structured data is the first step to bringing such structured data into a wiki page. The query itself and consequently the result of the query come with metadata that lets the wiki engine interpret the structured data. The depth of that metadata depends on the wiki engine and the data sources. In the minimal case, we can expect schema information, that is, the type of a data object and the names and types of its attributes.

The metadata can then be used to access the queried data object. We intend to implement a simple dot-notation based access method to reference attributes of business objects (e.g. `SalesOrder.BuyerParty`). With a basic object model in place, we intend to extend the Mediawiki wiki engine with lightweight end-user programming capabilities: Not only to reference data but to perform simple processing on it, like adding up columns in a table or combining multiple attributes of data objects for display to the user.

This kind of simple processing could enable a user to have spreadsheet like capabilities, or even associate dynamic information into online wiki documentation. The goal, again, is to allow users to write their wiki pages that perform lightweight computations of interest to the user.

We consider the combination of the robust and easy-to-use wiki editing and tinkering paradigm to be a promising step in empowering end-users with simple programming capabilities.

4. Conclusion

We have described a general solution for extending MediaWiki to integrate it with SAP business applications in order to create a lightweight end-user programming environment. The results thus far look promising to create a more advanced solution.

In the future we want to extend the edit mode inside MediaWiki by creating a query constructor which will aid a user to create business queries rather than having to remember the exact business query syntax and the underlying complex structured data model. Since MediaWiki is the most widely used wiki engine we decided to use it for this project, however we would also like to consider other application wikis like XWiki [5].

References

- [1] Bo Leuf and Ward Cunningham. The Wiki Way: Quick Collaboration on the Web. Addison Wesley, 2001.
- [2] MediaWiki <http://www.mediawiki.org>

- [3] Apache Tomcat <http://tomcat.apache.org>
- [4] JavaScript Object Notation <http://json.org>
- [5] Xwiki <http://www.xwiki.org>

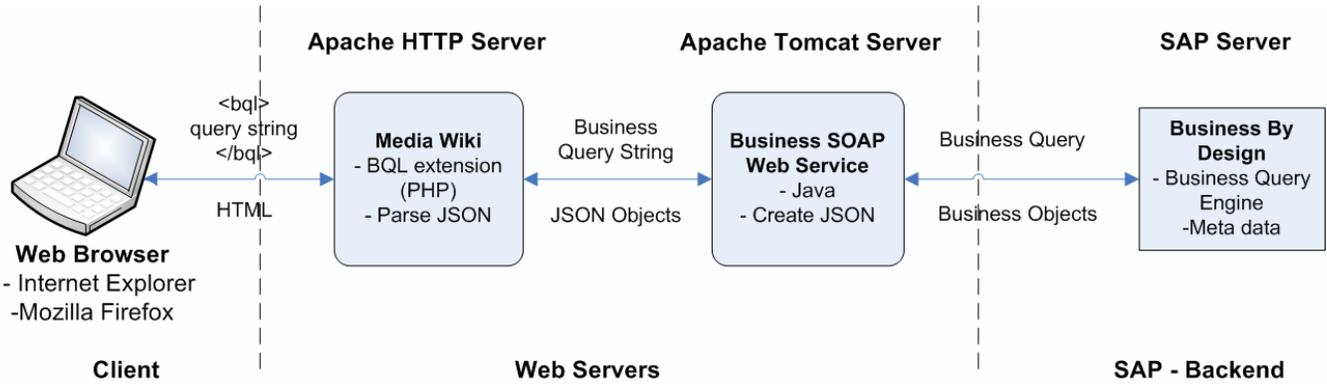


Figure 1. SAP Wiki Business Object Architecture.

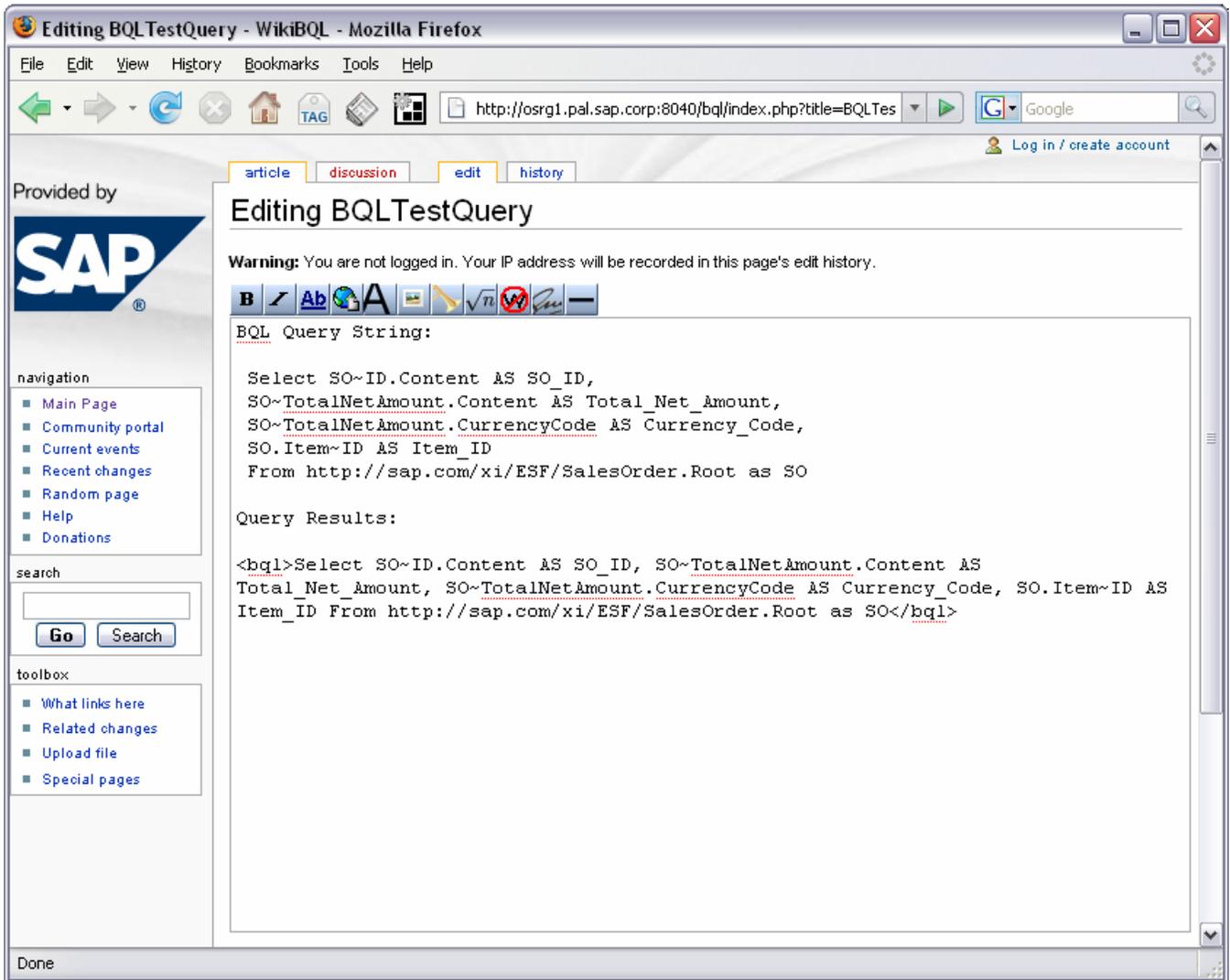


Figure 2. Creating a Business Object query inside Mediawiki.

BQLTestQuery - WikiBQL - Mozilla Firefox

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http://osrg1.pal.sap.corp:8040/bql/index.php/BQLTestQuer

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BQLTestQuery

BQL Query String:

```
Select SO~ID.Content AS SO_ID,
SO~TotalNetAmount.Content AS Total Net Amount,
SO~TotalNetAmount.CurrencyCode AS Currency_Code,
SO.Item~ID AS Item_ID
From http://sap.com/xi/ESF/SalesOrder.Root as SO
```

Query Results:

SO_ID	TOTAL_NET_AMOUNT	CURRENCY_CODE	ITEM_ID
5000000000	115167.07	EUR	1
5000000000	115167.07	EUR	2
5000000000	115167.07	EUR	3
5000000000	115167.07	EUR	4
5000000000	115167.07	EUR	5
5000000000	115167.07	EUR	6
5000000000	115167.07	EUR	7
5000000000	115167.07	EUR	8
5000000000	115167.07	EUR	9
5000000000	115167.07	EUR	10
5000000001	114536.99	EUR	1
5000000001	114536.99	EUR	2
5000000001	114536.99	EUR	3

Done

Figure 3. Displaying the results of a business query