

Semantic Assistants for Web Portals

- [Semantic Assistants](#)
- [Semantic Computing](#)
- [NLP](#)

Introduction

A data portal is a web-based software application, which provides a central entry point to an large number of different data sources. These mostly heterogeneous information are aggregated and presented to users based on their assigned roles. Ideally, an intelligent portal must be able to offer content to users, taking into account contextual information beyond a user's roles and permissions. In addition, convenient access to a wealth of information causes portals to quickly grow in size. With no standardized way of further processing the portals' content, their usability suffers considerably from the information overload issue.

As a new extension to our [Semantic Assistants](#) framework, the integration of Semantic Assistants for [Liferay](#) allows portals to automatically process textual content using state-of-the-art techniques from the Natural Language Processing (NLP) domain [1]. The SA-Liferay integration aims at bringing NLP power to this popular portal system and its users in a seamless, user-friendly manner, realized as a ready-to-deploy custom *portlet*. With this new integration, we envision a new generation of web portals that can provide context-sensitive support through semantic analysis services, in particular based on NLP, allowing AI "assistants" support portal users with their tasks at hand.

The screenshot shows two browser windows. The left window, titled "Semantic Assistants", displays a server URL and a list of available assistants. The right window, titled "SASampleContent", shows the results of a search for "Stephen Hawking".

Server:

Available Assistants:

- Contact Finder
- JavadocLiner
- Information Extractor
- OMM Impacts
- ReportedSpeechFinder
- English Durr Indexer
- OrganismTagger
- IR Information Extractor
- OMM Mutations
- Person and Location Extractor

Identifies and locates persons and locations in a document

Runtime Parameters

No runtime parameters.

Stephen Hawking

Content	Type	Start	End	Features
Stephen Hawking	Person	0	35	gender: male
Hawking	Person	416	423	
Isaac Newton	Person	692	704	gender: male
Professor Hawking	Person	714	731	gender: male
Stephen Hawking	Person	887	902	gender: male
Cambridge	Location	240	249	locType: city
Cambridge	Location	508	517	locType: city
Cambridge	Location	663	672	locType: city

Stephen Hawking is the former Lucasian Professor of Mathematics at the University of Cambridge and author of A Brief History of Time which was an international bestseller. Now Director of Research at the Centre for Theoretical Cosmology at Cambridge, his other books for the general reader include A Briefer History of Time, the essay collection Black Holes and Baby Universe and The Universe in a Nutshell. In 1963, Hawking contracted motor neurone disease and was given two years to live. Yet he went on to Cambridge to become a brilliant researcher and Professorial Fellow at Gonville and Caius College. Since 1979 he has held the post of Lucasian Professor at Cambridge, the chair held by Isaac Newton in 1663. Professor Hawking has over a dozen honorary degrees and was awarded the CBE in 1982. He is a fellow of the Royal Society and a Member of the US National Academy of Science. Stephen Hawking is regarded as one of the most brilliant theoretical physicists since Einstein.

Semantic Assistants Integration in Liferay Portal

Natural Language Processing in Web Portals: Use Cases



Semantic Assistants Portlet in Liferay

Portals' mostly heterogeneous information are aggregated from various sources and presented to users based on their assigned roles. Ideally, an *intelligent* portal must be able to offer content to users, taking into account contextual information beyond their roles and permissions. Below we iterate over some example scenarios on how NLP capabilities can aid users in the context of portals:

Named Entity Recognition

When dealing with large volume of textual documents or reading lengthy pages, a portal's intelligent assistants can help users by automatically finding named entities, such as persons, locations or organization names in a given text, helping them to quickly grasp the topics of the document at hand, without thoroughly reading the page.

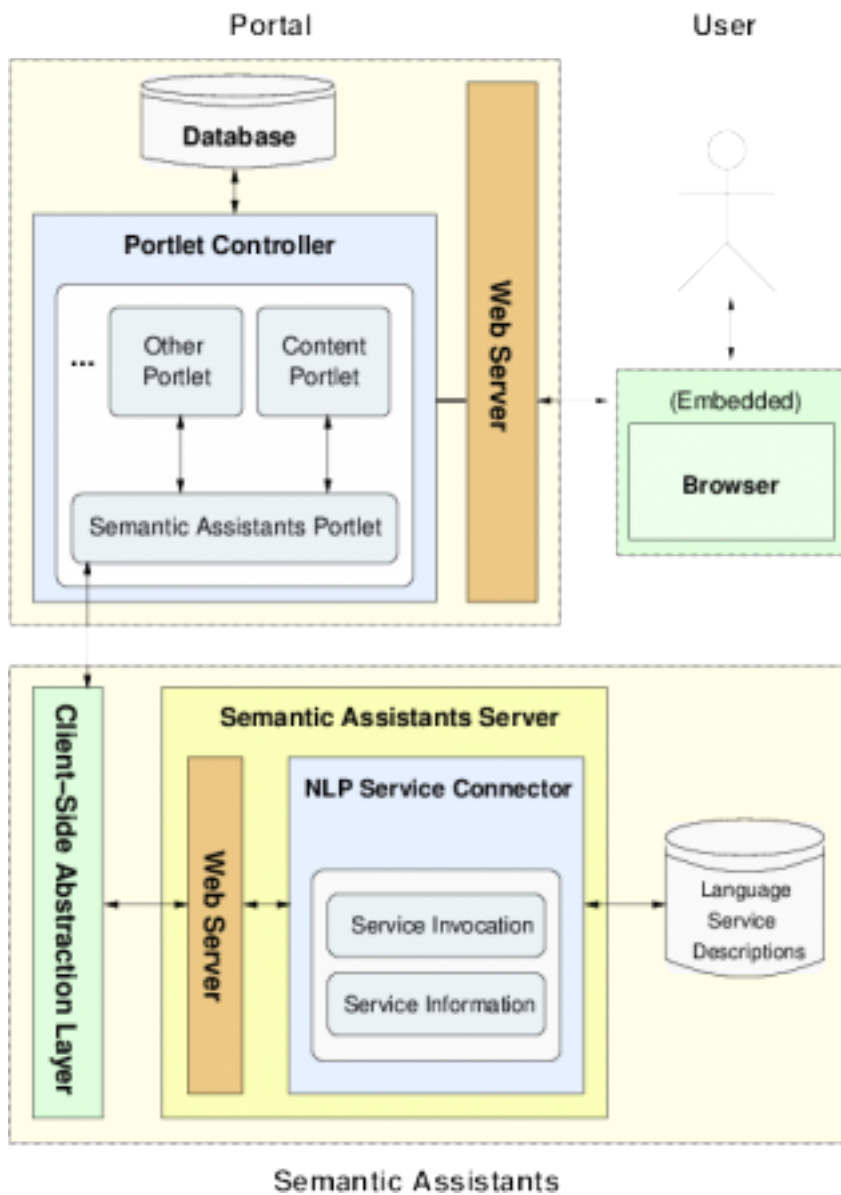
Indexing Portal Content

Ordinarily, an index page exists for large document collections that allows information seekers to find where in the collection a certain term is mentioned, much like the index found at the end of books. Using a combination of NLP techniques, one can automatically index the portal content and use it as a new facet for searching or discovering terms within the portal system.

Automatic Summarization

Another somewhat ambitious use case of NLP within the context of portals is the generation of automatic summaries from one or a collection of selected documents. Automatically generated focused or personalized summaries of portal content can help users find documents of interest in a more efficient way.

Architecture



The Semantic Assistants-Liferay Integration

Architecture

Our novel Semantic Assistants-Liferay integration architecture is designed to allow various portlets to benefit from NLP techniques on their content. The core idea is to enable generic portlets to communicate with the Semantic Assistants portlet, specifically designed to connect to the back-end Semantic Assistants server and provide inquiry and invoking capability of NLP pipelines to portal users.

In this architecture, all available portlets in a page can communicate with the Semantic Assistants portlet by sending content for analysis and receiving the results. To commence an analysis session, users interact with the portal via their web browser, for example, on their desktop computer or from a mobile device. Through this integration, users can select an NLP service to execute on a portlet’s content from a dynamically-generated list of available assistants in the Semantic Assistants server repository. Users can then invoke arbitrary NLP services on a designated text. The content to be analyzed can be set from any content portlet in the webpage by initializing a set of render parameters that the Semantic Assistants portlet is expecting to read. Thereby, user-chosen content is sent to the Semantic Assistants server for NLP pipeline execution. The results of each successful service execution are first received by the Semantic Assistants portlet and then passed on to the portlet that requested the NLP service. The receiving portlet can then read the results from the rendering parameters and translate it to a proper representation, e.g., a table, list or highlighted annotations in the text, as shown in the figure above.

Download & Installation

The Semantic Assistants integration can be added to any Liferay-based web portal through deployment of our Semantic Assistants portlet. You can download the portlet's binary archive from our [public distribution](#). For more information on how to deploy the Semantic Assistants portlet on your portal, please consult our Semantic Assistants [documentation](#).

Acknowledgments

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In the news

The first release is covered in the German news, [Informatiker aus Jena und Kanada entwickeln Open-Source-Software zur Analyse von Texten in Web-Portalen](#).

References

[J. Löffler, F. B. Sateli, B. König-Ries, and R. Witte. "Semantic Content Processing in Web Portals". *4th Canadian Semantic Web Symposium \(CSWS 2013\)*, vol. 1054, Montréal, QC, Canada : CEUR-WS.org, pp. 50–51, 07/2013.](#)



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