DeepInsight

Team:	DeepInsight
Platform Targeted:	Microsoft Office, Universal Windows Platform
Tool Used:	JavaScript, Office APIs, Bing Web Search APIs, JSON, Python, Azure Web App service, LUIS, Cognitive Services APIs.
Demo:	DeepInsight (Alpha 1)

DeepInsight will provide relevant contents available over the web to the user within office document window for ease of reference, analysis, and citation. Our tool "DeepInsight" has 4 major components as shown in the figure - 1.

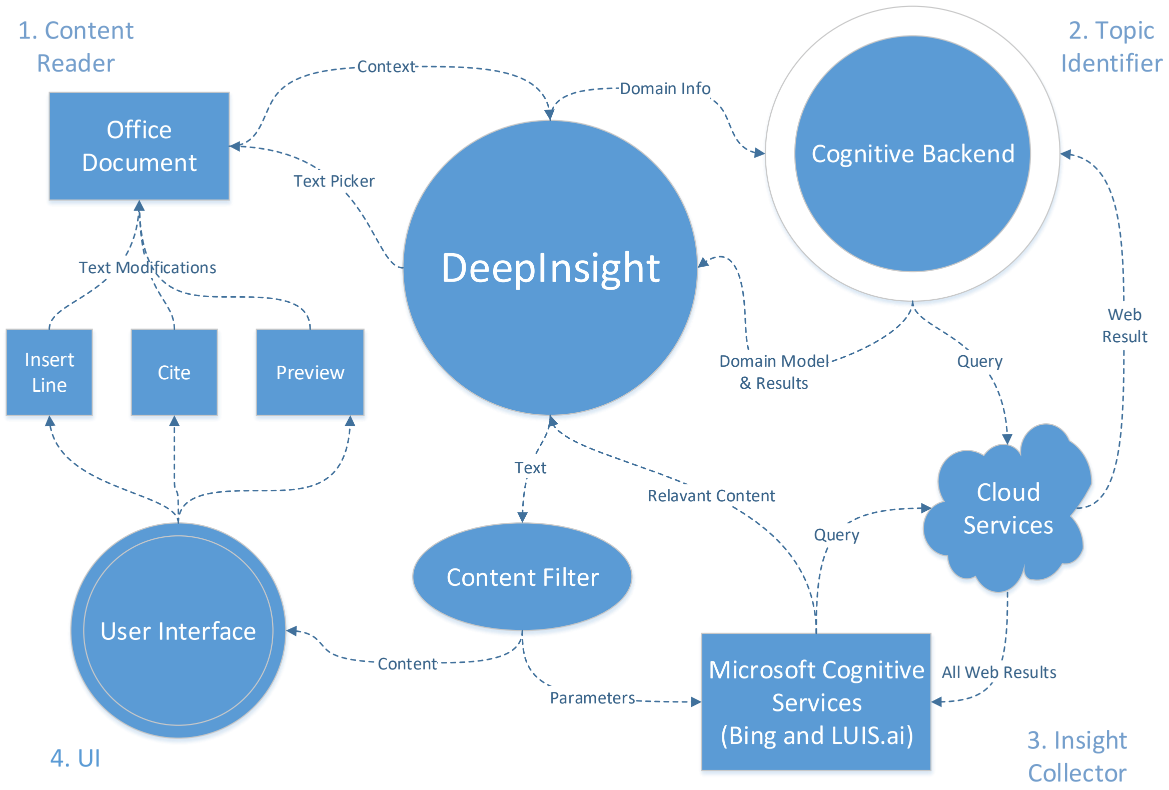


Figure-1: DeepInsight has 4 major components**. 1) Content Reader** uses Office APIs to read office documents. **2) Topic Identifier** uses machine learning libraries and trained models to identify the topic. **3) Insight Collector** uses bing web search apis to fetch relevant content from the world wide web. **4) User Interface** displays the various options to the users to enhance the documents in real time.

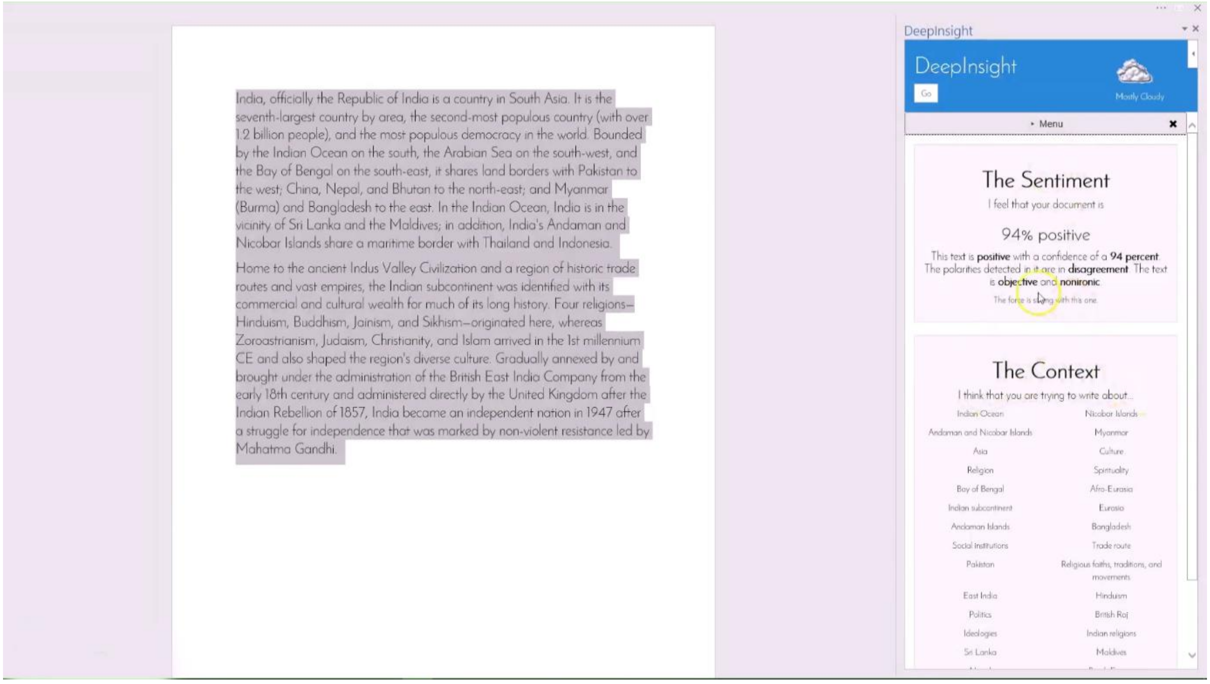
1. **Content Reader**: Read the content of the office document with the help of Office APIs

2. **Topic Identifier**: It identifies the domain or topic from the content with the help of backend server executing machine learning model trained on the corpus. The accuracy of our tool depends on this component. DeepInsight uses REST APIs for the communication with the backend server.

3. **Insight Collector**: Once topic is identified, DeepInsight fetches the relevant content available over the web with the help of Bing Search APIs. Fetched content is then sorted based on the different parameters such as relevance, date etc.
4. **User Interface**: GUI component of the DeepInsight tool displays the content in the same window as office document in a pop-up sidebar. It also allows user to -
    a. Check out the preview of the relevant content
    b. Insert the reference or citation in the document
    c. Insert the hyperlink of the content in the document

Sample

Below is a sample of how our app currently looks in office.



India, officially the Republic of India is a country in South Asia. It is the seventh-largest country by area, the second-most populous country (with over 1.2 billion people), and the most populous democracy in the world. Bounded by the Indian Ocean on the south, the Arabian Sea on the south-west, and the Bay of Bengal on the south-east, it shares land borders with Pakistan to the west; China, Nepal, and Bhutan to the north-east; and Myanmar (Burma) and Bangladesh to the east. In the Indian Ocean, India is in the vicinity of Sri Lanka and the Maldives; in addition, India's Andaman and Nicobar Islands share a maritime border with Thailand and Indonesia.

Home to the ancient Indus Valley Civilization and a region of historic trade routes and vast empires, the Indian subcontinent was identified with its commercial and cultural wealth for much of its long history. Four religions—Hinduism, Buddhism, Jainism, and Sikhism—originated here, whereas Zoroastrianism, Judaism, Christianity, and Islam arrived in the 1st millennium CE and also shaped the region's diverse culture. Gradually annexed by and brought under the administration of the British East India Company from the early 18th century and administered directly by the United Kingdom after the Indian Rebellion of 1857, India became an independent nation in 1947 after a struggle for independence that was marked by non-violent resistance led by Mahatma Gandhi.

The Sentiment

I feel that your document is

94% positive

This text is **positive** with a confidence of a **94 percent**. The polarities detected in it are in **disagreement**. The text is **objective** and **nonironic**.

The force is strong with this one.

The Context

I think that you are trying to write about...

Indian Ocean
Nicobar Islands
Andaman and Nicobar Islands
Myanmar
Asia
Culture
Religion
Spirituality
Bay of Bengal
Afro-Eurasia
Indian subcontinent
Eurasia
Andaman Islands
Bangladesh
Social institutions
Trade route
Pakistan
Religious faiths, traditions, and movements
East India
Hinduism
Politics
British Raj
Ideologies
Indian religions
Sri Lanka
Maldives

Figure – 2: shows the DeepInsight in working. The leftmost side bar pop up displays the relevant web links. Hovering the mouse over these links shows the various options to display such as Preview, Reference and Insert Link. The figure also shows the output of Preview function in 2nd left sidebar. Similarly insert link option will simply insert the hyperlink in the document and reference option add the citation number with reference at the bottom of the document.

Key features of our design approach:

1. **Modularity:** Using REST APIs for communication among different component with JSON objects brings the modularity in our design and make the components independent of each other.

    1. We can easily replace the backend with more complex, advanced and domain-specific models to further improve the accuracy in Topic Identifier component without modifying the Insight Collector or any other component.

    2. The REST architecture allows us to consume the same api and target multiple platforms. We are currently aiming at building an Office plugin as well as a UWP app. If time permits we will also build a chat bot using the newly announced bot framework.

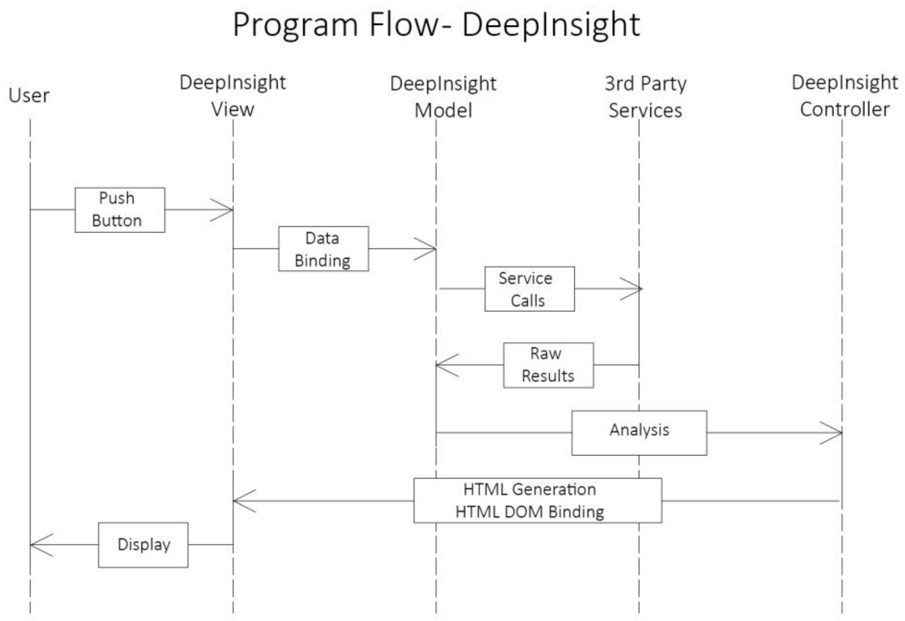
2. **Multimedia Content Support:** User Interface module also allows the user to insert hypermedia content such as images, graphs, charts, audios, videos etc. into the office document.

3. **User Friendliness:** The User Interface component will be simple to use and intuitive. The user can enable or disable DeepInsight easily. The user has no need to switch among multiple windows as relevant content from their favourite search engines are available to them in a ready to use manner. It increases user's efficiency to enhance the document and save the user's time.

DeepInsight empowers office users by providing relevant content from the web in real time. A user can use it to improve the content of the document. A novice user can also use this tool to get word suggestions to increase the language proficiency of the document.

Architecture of DeepInisght

The following image projects the overall structure of the DeepInsight. Data flow from layer to layer is independent of the functioning of other modules. Other modules are pluggable and the code is reusable



We follow modular design principles and each module can be replaced easily. Our DeepInsight tool can be easily integrated with other interfaces.

We need to write required glue code to interact with DeepInsight. Replace the DeepInsight View layer with the interface of choice to build a new application.

Solution is built keeping the extensibility in the mind. We have also changed the architecture of our tool DeepInsight from client-server to micro service based modular architecture. We can add further more services along with proposed one.

Personalization

We have not yet focused on personalization within the DeepInsight tool. But we can leverage the existing personalization features of Bing and other data sources by embedding O-Auth 2.0 (Azure AD) in the DeepInsight tool.

Demo Video

Please visit the following link for a demo of the current build of DeepInsight.

Youtube