

**Tech Focus**

# Teneo Technical Architecture

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**Synopsis**

A detailed look at the applications and technologies which make up the Teneo platform. [READ ON...](#)

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# Teneo Technical Architecture

The Teneo technical architecture combines three main applications:

## Teneo Interaction Engine

The core platform that manages conversations with users, creating responses from its own content base as well as receiving and sending data from and to external systems.

## Teneo Insight

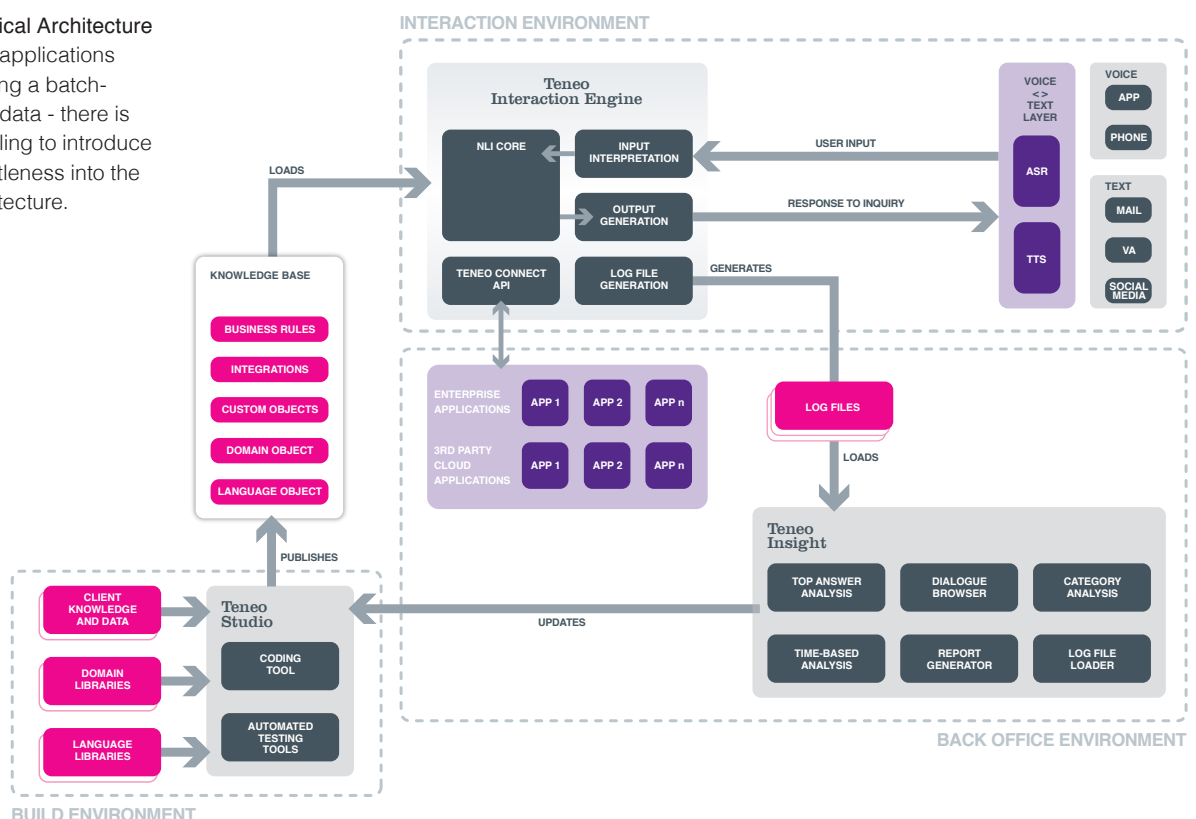
A business intelligence and reporting application, allowing both the business user and the knowledge engineer to understand online conversations, and identify improvements and additions to the content base.

## Teneo Studio

A desktop application used by both the trained business user and the knowledge engineer to create, maintain and publish the content base which drives the Teneo Interaction Engine.

### The Teneo Technical Architecture

Each of the three applications are integrated using a batch-based transfer of data - there is no real-time coupling to introduce complexity or brittleness into the deployment architecture.



## Teneo Studio

Teneo Studio is used to create and maintain the content base for the Teneo Interaction Engine. This content base is then used to hold online, intelligent and human-like conversations with users.

Teneo Studio currently is a desktop application, but will have a web-client in the near future. Data created and stored during the development of the content base is maintained in a proprietary data format, and can be stored either on the file system or on a central back-end server as “.solution” files. This flexibility has many benefits including simplified deployment for the application, when appropriate removal of dependencies on external application versions, thereby simplifying upgrades and maintenance, no additional runtime license fee with no additional database servers, and no additional database drivers required on the client.

An important and valuable component of the Teneo Studio applications are the bundled Language and Domain Libraries.

### Language Libraries

The Language Libraries provide support for building Teneo Virtual Assistant applications in 21 languages out of the box with language objects.

### Domain Libraries

Domain libraries provide support for business domain-specific content in fields such as finance, travel, healthcare, insurance and other sectors.

## Content Base

When the content base is ready to be published to the Teneo Interaction Engine, it is first exported into an XML-based file format. This is then deployed to the server hosting the Teneo Interaction Engine using a suitable mechanism - FTP is commonly used, and deployment can also be automated. Once again, this deployment mechanism has been purposely kept simple. Server-to-server database replication is avoided, as this would change the nature of the required connectivity between the Developer and Engine platforms, as well as introduce complexity around incremental data update, distributed transactions and other issues.

It is important to understand that the Content Base is supplemented and supported by existing data in the client's own systems, which can then be added to the response constructed by the Teneo Interaction Engine and displayed to the user. For example, answers can be supplemented using pricing or stock availability from ecommerce systems, customer data from CRM applications, and so on. Equally, information gathered from the user in the course of dialogs can be used to update external systems, or can be used to trigger external processes.



**Teneo Interaction Engine is the world's most robust natural language interaction (NLI) engine.**

### Teneo Interaction Engine

The Teneo Interaction Engine is a Java 6 SE application built on the Spring application framework and running in any suitable servlet container.

The core of the application consists of two main subsystems, the language processor and the dialog interface. Together these subsystems are responsible for receiving input from the user via the appropriate channel, understanding this input, querying the Engine Data in order to determine the most appropriate response, and then returning this response to the user via the channel.

The Teneo Interaction Engine is supported by various components for data parsing and loading, logging, and external application integration. The parsing component reads the Teneo Interaction Engine data which has been deployed by Teneo Studio, parsing it and storing it in a memory-based representation. This representation is optimized for run-time access during the process of executing dialogs with the user. As with Teneo Studio, there is no dependency on a database platform which would increase complexity and cost and add no value to the application. The logging component maintains logs of all dialogs with the user to support offline analysis using the Teneo Insight application.

When responding to a user dialog, the Teneo Interaction Engine can draw part of its response from external data sources or applications. For example, Teneo Interaction Engine might query

product pricing or stock levels at retail stores from an e-commerce system, or request the user's address from a CRM system, in order to provide the fullest response. It can also use data gathered from the user dialog to update external applications, such as a change of address or communication preferences in a CRM system, or creating an appointment with an advisor in a diary system. The exchange of data can use XML, CSV or any other preferred format, and can be communicated over common interfaces such as JDBC, HTTPS and web services. Teneo Interaction Engine can also trigger external processes depending on user input during the dialog, such as starting a loan application process.

### Teneo Insight

Teneo Insight is a web-based application allowing authorized users to read and analyze the dialog logs that are generated by the Teneo Interaction Engine. It is a powerful business intelligence tool allowing the client to continually improve their customer's experience.

The application comprises four main components:

#### Import Server

The Import Server module consists of scripts that copy dialog transcript files from the Teneo Interaction Engine environment to the Logroot server. The logroot server can be Network Attachment Storage, shared disc space or even a server within the network from which either ETL and data warehouse module or and Import scripts can perform read/save operations.

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Teneo Insight provides valuable insight into your customers' needs and behavior.

### ETL and Datawarehouse

The Extract-Transform-Load (ETL) module is a java application that reads unprocessed dialog transcripts and, once processed, stores them the Datawarehouse. The Datawarehouse stores the processes data retrieved from the dialog transcripts in facts and dimension tables. The datawarehouse runs on MySQL Server 5.5.x.

### QlikView Module

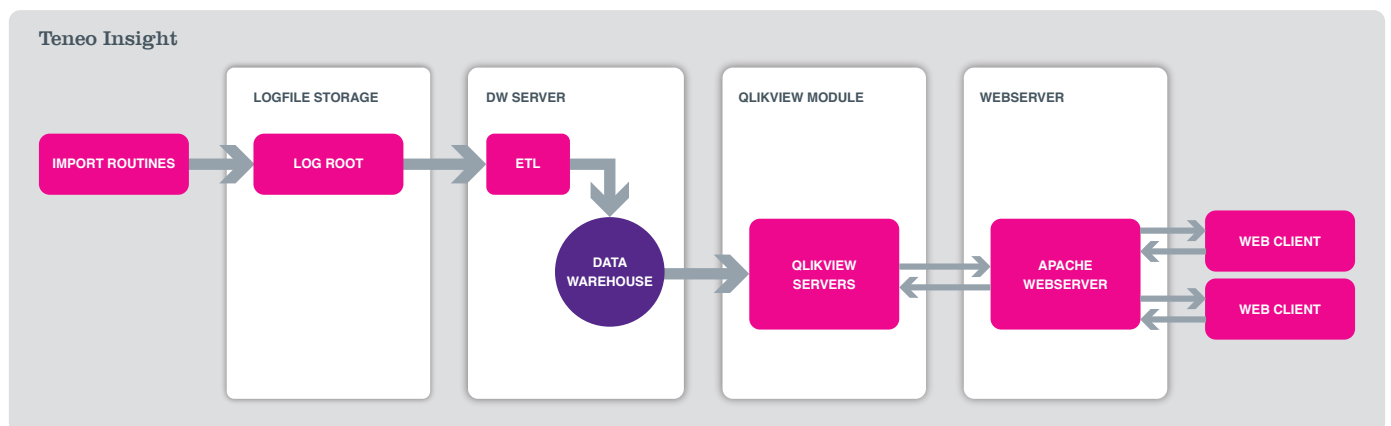
The QlikView module is an OEM component from the BI vendor QlikTech. The module consists of several clustered servers running on Windows Server x64, and uses load balanced set-up. Due to the in-memory data analysis, in which large datasets are loaded from the datawarehouse to the QlikView module, servers with high RAM are used to provide a highly responsive system.

### Web Interface

The web client can be accessed with credentials from any modern internet browser. The webclient uses AJAX technology, or alternatively an Internet Explorer ActiveX plugin can be used.

The application has access to all historical dialogs in its data set, and provides advanced reporting functions to generate a broad range of reports, graphs and views. Standard reports include numbers of visitors, numbers of dialogs, number of questions, number of forwarded queries - per hour, day, week, month, year, time of usage, time and length of dialogs, top lists, and statistics by category and sub-categories. Custom reports can be specially developed as part of the implementation.

Teneo Insight



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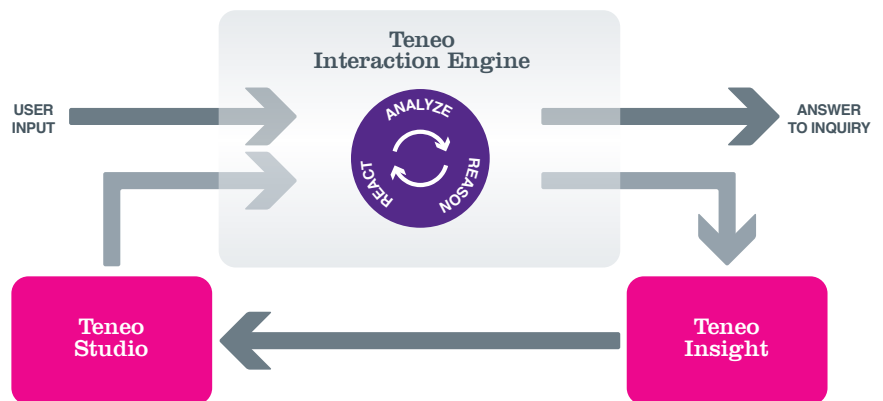
Insights are used to further improve the customer experience.

### The Teneo Lifecycle

The Teneo application suite should be considered in the context of a lifecycle of continuous improvement in customer service. Deploying a virtual assistant to improve the customer experience is not the end of the process. The nature of the interactions between your customers and Teneo Interaction Engine must be analyzed in order to gain insights into not only the questions and issues being raised by your customers, but to assess the quality of the responses generated by the assistant. These insights are then used to refine the content used to build the Teneo Interaction Engine data and so further improve the customer experience.

This diagram represents the Teneo application suite in the context of this continuous improvement, from the initial definition of the solution through building the engine data, your customer's interaction with the Teneo Interaction Engine, and your measurement of the quality of the customer's experience leading to refinement of the solution.

NLI Lifecycle





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## About Artificial Solutions

Artificial Solutions develops and implements software-as-a-service based virtual assistants that allow intelligent conversations between people and computers to be held in 21 different languages across multiple channels including the web, mobile (smart phone), SMS, email, social networks and live-chat. Utilizing its natural language interaction technology, Artificial Solutions helps organizations improve customer experience and reduce the cost of online queries. With its development centre in Stockholm, its employees represent 30 nationalities in offices in Sweden, Spain, UK, Italy, France, Slovenia, Germany, Denmark, Japan and the Netherlands. For more information, visit [www.artificial-solutions.com](http://www.artificial-solutions.com)

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