

## TENEO LANGUAGES

- CREATE HIGH-QUALITY MULTILINGUAL CONVERSATIONAL APPLICATIONS AT SCALE, IN LESS TIME, AND WITH LESS EFFORT, THAN EVER BEFORE.
- MAXIMIZE ROI WITH FASTER DEVELOPMENT TIMES AND THE REUSE OF EXISTING ASSETS.



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### DEVELOP ONCE. DEPLOY IN MANY LANGUAGES.



Teneo Languages allow organizations to create high-quality multilingual applications in less time, and with less effort, than ever before.

Teneo Languages are the powerhouse of Teneo's linguistic capabilities. Under continuous development for over a decade, these natural language understanding (NLU) building blocks are crucial in enabling enterprises to quickly build conversational applications that can truly comprehend what the user is saying, in over 40 different languages.

### KNOWLEDGE IS POWER

But is not simply about understanding different languages; Teneo Languages can also cover knowledge specific to companies, industries or use cases, allowing for even further personalization of the solutions. Furthermore, our innovative 'Master/Local' deployment approach enables organizations to expand their conversational AI applications across other languages, simply by ticking a box.

Thanks to the way Teneo Languages is designed, enterprises can build a master version in one language, and simply localize in any other, meaning they can reuse about 80% of the original build - with no need to start from scratch. For example, the specific language structures and models for a Swedish bank can be easily ported to operations in America, Russia or Japan.

### MAXIMIZING THE MULTILINGUAL ADVANTAGE

In today's global economy, the more native languages an enterprise can communicate with its customers in, the better. Teneo provides resources for understanding and easy working with languages, and our in-depth understanding and rich resources for each one means highly complex conversational solutions can be developed quickly and at scale.

Every component and function of Teneo can be used in any of our languages. This makes Teneo perfect for enterprises looking to deliver high-quality conversational applications across global operations, while maximizing ROI with faster development times and the reuse of existing assets.



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## HOW DOES IT WORK?

Teneo Languages allow enterprises to teach new conversational applications all the possible language permutations in a matter of moments. Our Teneo NLU Ontology and Semantic Network map the very structure of language itself, removing one of the most costly and time-consuming parts of building conversational AI applications – teaching a machine to understand human language. The user simply enters a few representative queries, and Teneo Languages will enable the application to learn all the different ways a user might ask the same exact question.



Because Teneo is available in over 40 languages, you can deliver geo-specific conversational AI applications with the feel of a consistent global brand. Teneo Languages enable the application to ‘think’ in your native tongue, while delivering the same linguistic sophistication across every other language required. Our technology allows enterprises to share the core knowledge across all deployments whilst retaining the ability to adapt local implementations for different business processes.

## BUILDING LANGUAGES IN TENEO

Being able to develop your next CAI solution in multiple languages is already an advantage but making the process easier and faster is a game changer. Teneo’s exclusive syntax language enables non-linguist developers to fast-track several steps in a typical build process. This unique and powerful modeling language automatically applies language conditions, such as understanding when the word “book” is used as a noun or verb in a sentence, recognizing sentiment or providing a safety net to further ensure a humanlike conversational experience in the final product.

Developers can also use our conversational modules, which deliver pre-built solutions with back-end integration for common dialogues such as live chat handover or booking a meeting room. These support the wide range of existing pre-built conversational knowledge that enables a chatbot to have a personality, continue the conversation even when the user has gone silent, maintain a personality that aligns with the enterprise’s brand values and keep the momentum going even when the user goes off topic. Just tick a box and they are readily available in your solution.



## UNDER THE HOOD...

### Input Processors

Teneo understands each language's alphabets and characters, understands what a word and a sentence are in each of those languages, can normalize and pre-process text (e.g. tolerate misspellings and abbreviations, perform morphological analysis) in those languages. We call this **Input Processing**. Other people call it Natural Language Processing (NLP).

An Input Processor pre-processes inputs for Teneo Engine in order to perform different processes on it such as normalize it, tokenize it or do POS tagging, Named Entity Recognition or Morphological Analysis etc. Each language that the Teneo Platform supports has a chain of carefully selected Input Processors that know precisely how to process that particular language.

In addition to input processing, Teneo also offers higher level language resources, like lexicons and basic (commonly occurring) dialogue capabilities. We call these Lexical Resources and Dialogue Resources, respectively. Other people call them NLU and Conversational Interaction, respectively.

"an input processor is needed in order to pre-process user input and prepare it for its use by the solution. The input processing involves splitting text into sentences and words"

### Lexical Resources

Teneo's Lexical Resources are essentially off-the-shelf building blocks to be used for modeling conversational solutions in Teneo Studio. They come as components of the Teneo platform and are structured and designed to facilitate understanding of a specific language. They cover the common language conditions and phrases that Teneo applications will most likely need. Teneo's Lexical Resources provide an extensive collection of language objects with a comprehensive amount of wordforms and synonyms, which ensure a high natural language coverage. Moreover, using language objects in input matching conditions enhance their clarity and consistency and facilitates maintenance and later enhancements.

Whilst they cover general language vocabulary and common phrases, Teneo Studio provides the possibility to create additional lexical resources to adapt or to extend existing resources as per project needs. Project-created lexical resources can be re-used in other projects, different conversational applications or at later project stages within the same domain. And it is not only possible to create new language objects, but it is also possible customize language objects coming from a Lexical Resource.

"off-the-shelf building blocks to be used for modeling conversational solutions that cover the common language conditions and phrases that Teneo applications will most likely need"

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## Log Data Analysis

Teneio Lexical Resources are designed not only to be used for dialogue modeling, but they may also be used in log data analysis, where they enable customized information access. The analysis of log data plays a crucial role during development and maintenance of dialogue solutions; it may reveal strengths and weaknesses of the existing solution and give indications of improvements.

Apart from dialogue design, log data analysis may also be used to reveal customer preferences for certain products as well as customer satisfaction statistics.

A simple way to perform log data analysis is provided directly within Teneio Studio with the Teneio Platform featuring Teneio Inquire, and the query language called Teneio Query Language (TQL) which has been developed specifically for this task. TQL can be used in conjunction with language objects from the same or a different solution to customize queries on log data.

## Teneio Dialogue Resources

Dialogue Resources (often referred to as "Smalltalk") are solutions with flow drafts which a project can use as a template when starting the project.

They are more than simply chit-chatting flows, they are the generic dialogue capabilities that a conversational application needs in order to be humanlike, show social skills, personalized behavior and to simulate intelligence and in this way show off our technology, engage the user and make them trust its capabilities.

We know from experience that users do see digital assistants as embodied agents and they expect them to be able to talk outside of their scope (i.e. non-project topics), to be able to follow social rules in dialogues (i.e. being polite, respond to greetings) or cleverly respond to things when testing their capabilities.

By providing generic dialogue capabilities for a language, we help ensure that the solutions built in that language will react appropriately to the social talk utterances we know they will come across in order to:

- Engage users more when talking to it – increasing traffic
- Create social bonds with the digital assistant – returning users
- Convey a sense of intelligence and communicative capabilities – confidence in our technology
- Give credibility – making the users trust our technology to use it to perform important tasks
- Achieve better statistics – giving less non-understanding responses
- Redirect to project-specific topics in a smooth and smart way – improve statistics and traffic!

"a Dialogue Resource is a collection of flow drafts selected to handle the most frequent non-project specific user inputs. It includes social skills, common dialogue behavior by users and some very frequent cross-domain small-talk topics"



## Hybrid Dialogue Resources

Teneo is always at the forefront of multilingual capability development. One of these innovations is our “Hybrid” Dialogue Resources.

Hybrid Dialogue Resources employ three main types of flows: **Syntax**, **Class** and **Hybrid**.

- The **Syntax** flows use linguistic rules exclusively and are particularly useful for identifying specific types of inputs with high precision, for example when the user says Hello, Goodbye, etc.
- The **Class** flows use the Teneo Platform’s native machine learning capabilities that learn how to predict intents based on the training examples provided. Unlike Syntax or Hybrid flows, these flows require no hand-crafted linguistic rules, only a few positive examples.
- The **Hybrid** flows use a combination of Class triggers and Syntax triggers to leverage the best aspects of both machine learning and linguistic rules. These flows allow for the precision of linguistic rules and the flexibility of machine learning.

## WHAT DOES IT MEAN THAT A LANGUAGE IS SUPPORTED?

Many conversational AI solutions claim to be multilingual. But to really evaluate how deep this support goes, you must look past the headlines. Truly conversational AI must be able to handle all types of input – from friendly greetings and chit chat; to specific requests and questions, vague, ambiguous or even competitor-based queries; to completely off topic, out of scope inputs. Repetitive and non-contextual canned safety net replies like “I’m sorry I don’t understand” only frustrate and annoy customers.

With Teneo, support for a language encompasses three main elements:

- How the Teneo Platform can pre-process the user input
- What type of Lexical Resource is available and what it covers
- Whether there are any Dialogue Resources available, and their coverage

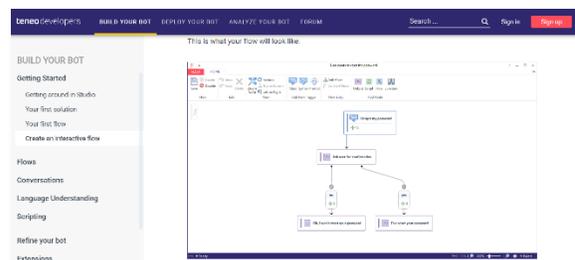
For large enterprises operating across the world, implementing a sophisticated multilingual conversational AI capability will supercharge the customer experience, drive significant usage revenues and strengthen client relationships. In turn, this will enable client enterprises to take control of the conversational AI landscape and deliver greater value through increased customer satisfaction and competitive advantage.

## NEXT STEPS

Sign up to **Teneo Developers** for your free trial and start building truly multilingual solutions straightaway:

[www.developers.artificial-solutions.com](http://www.developers.artificial-solutions.com)

Click [here](#) to watch a video on Teneo Languages



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### ABOUT ARTIFICIAL SOLUTIONS

Artificial Solutions® is the leading specialist in enterprise-strength Conversational AI, a form of Artificial Intelligence that allows people to communicate with applications, websites and devices in everyday, humanlike natural language via voice, text, touch or gesture input.

Designed for the global enterprise, the company's advanced conversational AI platform, Teneo®, allows business users and developers to collaborate on creating sophisticated, highly intelligent applications that run more than 40 languages, multiple platforms and channels in record time. The ability to analyze and make use of the enormous quantities of conversational data is fully integrated within Teneo, delivering unprecedented levels of insight that reveal what customers are truly thinking.

Artificial Solutions' conversational AI technology makes it easy to implement a wide range of natural language applications such as virtual assistants, chatbots, speech-based conversational UIs for smart devices and more. It is already used daily by millions of people across hundreds of private and public-sector deployments worldwide.

For more information visit [www.artificial-solutions.com](http://www.artificial-solutions.com).

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