

Natural Language is a hot button topic for many enterprises right now, driven by high profile consumer technology companies providing a taster of what's possible.

READ ON...

Natural language is the interface of choice for intelligent interaction between humans and the technology they use, own and wear. People want to use everyday phrases, terminology and expressions to control apps, online services, devices, cars, mobiles, wearables and the Internet of Things (IoT). And they expect intelligent responses.

In the past, technology controlled the user. Every time the technology updated, the user had to relearn. But what if technology could understand users, not the other way around? A person could simply tell the technology what he or she wants to achieve - in their own words, using their chosen language and terminology. The manual would be torn up. One of the main constraints of technology lifted.

It would be technology that thinks!

In the beginning...

From simple beginnings, natural language applications like digital employees have grown to become the gateway to customer contact centers, the number one sales employee, the executive PA and the business analyst. They are no longer a 'nice to have', but an essential part of communicating with customers.

But this is only the start of the natural language revolution. By 2020, natural language will be as critical to a business as its website is today. It will control every aspect of man and machine interaction, from artificially intelligent personal assistants to speech-enabling the IoT.

The underlying technology that enterprises choose to develop, deploy and analyze their natural language solutions will have a significant impact on how fast they can react in the future. Delivering natural language applications to evolve with a business requires a reliable development and analytics solution that is scalable, multi-lingual and device independent; one that can seamlessly integrate with back end systems and third party applications. But equally important, one that is easy to use.

Until recently, embarking on this type of implementation was a lengthy and complex process, only undertaken by computational linguistic specialists and technical experts. The end solution was more often than not a hard-baked solution presented to the customer with no easy or quick way to adapt and react to changing requirements. This rigid approach sounded the death knell for many projects in their infancy, as businesses found they'd either ended up with a sub-par product, or called time on the fledgling project before delivery, when they or their project sponsors realized it wasn't going to do what they really needed.

However, times change and the new era of user-accessible and usable natural language solutions is in full swing, opening up the implementation process to allow users to work directly with the solution, and be able to adapt and manage a natural language project as an ongoing 'live' entity. By using an end-to-end platform that addresses the full cycle of building, deploying and maintaining a natural language solution, control is put back where it should be - in the hands of the business who can nurture and grow it to suit their changing requirements.

“

Natural language applications are no longer a 'nice to have', but an essential part of communicating with customers.

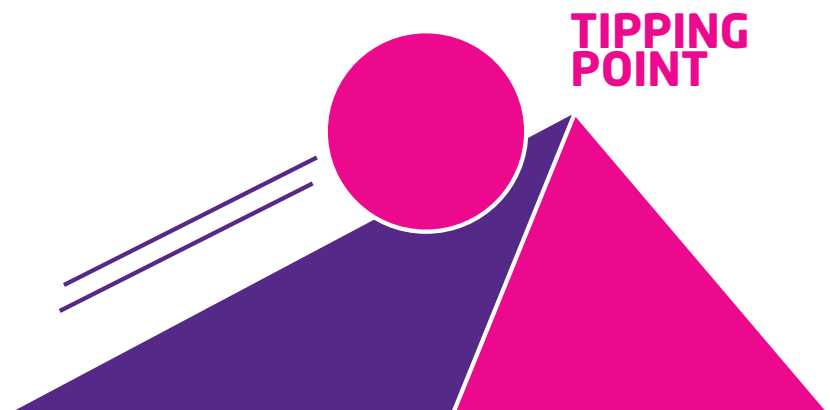
The Natural Language Opportunity

The Immediate Mobile Opportunity

Consumer appetite for mobile shows no sign of slowing down. Every research study published shows increasing demand for the ability to transact, contact and react online and at any time, on the device of the user's choosing. This appetite is a huge opportunity for the enterprise in terms of opening up new revenue streams and gaining a larger per-customer share of spend. But it does require a rethink about how to deliver the smooth, effortless and fast interaction that mobile users expect – simple layering a mobile app over existing channels won't cut it.

But even within the wider mobile revolution, change is happening. The breakneck speed at which wearables and other screen-free devices have caught the consumer's attention means even recently implemented mobile apps are struggling to stay relevant, being reliant on a single screen to navigate and display information. Multi-tasking, information-hungry users demand more than a cut down offering of the enterprise website.

Smartphone usage:



The Tipping Point for Artificially Intelligent Natural Language Interfaces

Artificially intelligent natural language is at a tipping point. Driven by widespread adoption of tools including personal assistants on smartphones, consumers expect technology not just to hear them, but to understand them and react intelligently too.

While speech is a distinctive feature of these apps, it is how well they understand the complex sentences people use in day to day speech and, more importantly, how accurately they respond, that is important to their effectiveness.

Features such as machine learning and implicit personalization enable enterprises to use artificial intelligence to understand more about an individual's likes and preferences purely through their natural language interaction with the device. This deep understanding is only achieved through real-time interpretation of the data, combined with the ability to access specific information related to an individual from other data sources. These might include a CRM system or a third party app.

By pulling together disparate information, enterprises are able to open up new marketing possibilities and revenue opportunities. Furthermore, natural language-based analytical capabilities will enable organizations to unlock the knowledge from these millions of conversations, delivering immediate access to an unrivalled depth of understanding into the voice of their customer alongside key business intelligence.

This further reduces the burden on the user – no more having to learn how to use the technology and laboriously teaching it about themselves. These capabilities are here today and in use to some degree. Wider use could be made but privacy is a concern, although in practice many users are willing to allow personal data to be used, for a perceived value in return.

The Current Marketplace

In the last eighteen months the major technology goliaths have refined their natural language intellectual property assets, boosted them through acquisitions and even separated their business structure to take advantage of the new market opportunity.

Trailblazing companies like Amazon have already branched out to create their own devices ready to listen, and sell, whatever the customer wants to purchase. Others are moving into new revenue areas such as home automation or in-car communications.

However, global technology analysts Gartner predict that through to 2018, there will be no dominant IoT ecosystem platform. Enterprises will need to construct IoT solutions from multiple providers or use a holistic platform to ease the burden of developing complex solutions.

But developing a consistent, cross-channel way of interfacing with technology that can deliver artificially intelligent styled understanding requires a deeper interaction than the majority of natural language technologies can deliver today. This where the Teneo Platform can help.



The smart machine

era will be the most disruptive in the history of IT



Overall natural language market is forecasted to grow to

\$13.4 billion

by 2020.

(CAGR: 18.4% 2015 - 2020)



By 2020, 40%

of mobile interactions will be using personal assistants and other types of smart agents, acting autonomously on the user's behalf



The market for intelligent virtual assistants to reach US

\$5.1 billion

by 2022

The Teneo Platform

Teneo enables enterprises to rapidly build a diverse range of intelligent natural language applications across multiple languages, channels and platforms; speech-enabling consumer electronics across IoT, home automation, wearables, mobiles, games and applications; and developing intelligent digital employees to automate self-service and online sales support.

One example of how Teneo can deliver more than traditional solutions is in the field of second-generation intelligent virtual assistants used to support automated customer services and proactive online sales. Alone, this market for intelligent virtual assistants is expected to reach US \$5.1 billion by 2022. Additionally, as devices become smaller, wearables more commonplace and the IoT really takes off, natural language interfaces will dominate the landscape.

Furthermore, Teneo's ability to capture, analyze and interpret large volumes of unstructured conversational data delivers 'voice of the customer' understanding, actionable insight and implicit personalization, an exciting opportunity for new data-driven revenue streams.

How Enterprises Use Teneo

Most organizations start their natural language journey with a requirement to solve a specific problem. In the past this would typically be to deploy a digital employee to answer online customer queries, resolve issues, find information, process transactions, cross-sell complementary products and services.

However, during this time the computing landscape has changed. Low cost semi-conductors that are constantly decreasing in size have enabled manufacturers to add computing capability to almost anything. At the same time the exponential take up of 4G mobile broadband has meant that users now spend nearly twice as long online with their smartphones than with their personal computers or laptops.

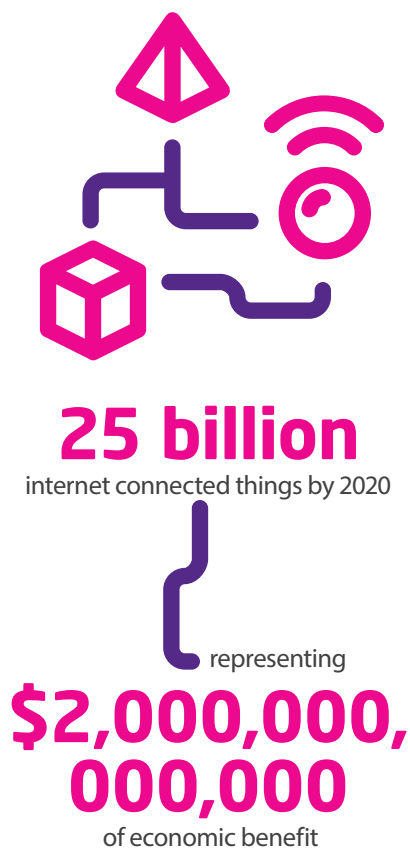
In order to engage with these audiences, enterprises are expanding their natural language interfaces to communicate with customers on a range of devices, apps and services. It is now not uncommon for an enterprise's first experience in developing a natural language application to be developed on a mobile, not a website.

But natural language is also impacting on other areas of an organization's businesses. Digital employees can help improve productivity by allowing users to carry out a multitude of tasks simply by asking this 'virtual PA'. Deep integration with back-end systems and an understanding of the organization, along with a close working relationship with real-life colleagues, can transform the internal workings of an enterprise.

Who should be using it?

- Connected consumer device manufacturers requiring intelligent, speech-enabled user interfaces and applications.
- Enterprise organizations seeking to improve their online and mobile customer experience and develop new revenue channels.
- OEM partners looking to differentiate their technologies by embedding natural language capabilities into their offerings.
- Systems Integrators developing sophisticated natural language-based projects for clients.
- App Developers wishing to differentiate themselves by offering their clients mobile apps that take advantage of the benefits of natural language.

Teneo



Market Drivers to Consider

Solving the Customer Disconnect

Many consumers have abandoned the traditional High Street wherever possible, preferring to use online channels for shopping, banking, information gathering and social interaction. This created a chasm between customer and corporation. But as businesses rushed to catch up, they forgot to look ahead. Most enterprises saw no further than creating mobile versions of their offering, missing the emergence of natural speech, gesture and other related technologies that the large consumer technology companies begin using as market differentiators. What started as a gimmick turned into mainstream communication preferences.

Data-Driven Communication

Another aspect that is driving the use of natural language for enterprises is to encourage users to deliver more data on which to build their businesses. For consumers however, it is the desire to interact with technology and companies in their own time, using a device of their choice.

Since consumers are the driving force behind the uptake of technologies that will benefit from natural language, it is primarily these technologies that should be considered as the main influencers.

The Device War

Mobile will be the main battleground where companies will win, serve and retain their customers, according to technology analyst firm Forrester. It estimates that there are nearly 30 billion mobile moments (where a consumer picks up their phone) every day. Delivering a personalized, relevant, fast experience enabled through natural language will differentiate those businesses which recognize the demand and produce a solution that engages and delivers on the consumer's terms.

IoT

Gartner predicts that there will be 25 billion internet connected things by 2020, representing nearly US\$2 trillion of economic benefit. This is clearly a huge opportunity waiting to be tapped by those enterprises who understand the way that consumers are directing the market.

Cognitive Computing

Even as IBM Watson uses its massive computing power to make huge leaps in complex areas like healthcare and renewable technologies, it's important to remember that its main strength is as a back-end processing super-brain; and therefore only applicable in a limited number of circumstances. These are quite aside from the very real need for intelligent, highly customizable natural language interfaces that can interact with real consumers in the real world.

The Benefits of Natural Language

Derive Actionable Insight

People reveal significant amounts of information during a conversation, such as why they are searching for something, particular features of interest, or even the reason they are hesitant to purchase.

Now enterprises can analyze these natural language conversations in near real time, providing actionable insight that can transform the bottom line.

Think of a traditional focus group, multiply it by a million and you get some idea of the insight into customer behavior that this type of technology can provide. It can be used not just to study trends, but to react immediately and personalize the interaction.

This information can be further enhanced by using the intelligence of the NLI to ask users specific questions if the opportunity arises during a conversation, giving the organization insightful, actionable data direct from their own customers.

Optimize Internal Resource

Natural language-powered solutions allow organizations to route conversations intelligently, based on a number of factors, such as the topic of a conversation or whether or not a contact center is open, and can pass on the relevant specifics of a conversation. In addition, because they work with a variety of input methods, the small screen real-estate on mobile and wearables doesn't present a challenge. All this ensures that a consistent and accurate response is given to the customer.

Countering the Customer Disconnect

Businesses moved from the high street to the internet because that was what their customers demanded, but the honeymoon period where the web increased operational efficiencies for businesses and was more convenient for the customer is over. Today most businesses are disconnected from their customers. Their only interaction has been reduced to little more than ticks in boxes and a confirmation click. Aside from a few demographics, they have no idea who they are, why they bought a particular product, or what they are likely to purchase in the future.

Improving the Customer Relationship

In order to increase customer satisfaction, organizations need to develop an omnichannel service, one that delivers consistent results regardless of where the customer joins or finishes the conversation.

Rarely is a question asked in isolation, there is always a deeper reason for wanting to know an answer. For instance a user might ask what terminal their flight leaves from, because they need to book the relevant parking. In order to react intelligently to the user, natural language applications enable other factors such as context, memory, intelligent understanding, previous experience, and personalized knowledge of the user to be taken into consideration. This allows the enterprise to not only give their customer the answer to the obvious question, but also to offer to solve the unspoken one too.

Deliver Individualized Service to Everyone

Providing great customer service doesn't just stop at being able to converse intelligently. Personalization is a key ingredient in a natural language solution. Knowing a user's dislikes and likes is crucial to delivering proactive engagement by pre-empting, and in some cases predicting, the information a customer wants before they even realize it themselves.

All this adds up to a customer service that increases customer loyalty, but still takes advantage of technology to deliver lower costs, alongside improved efficiencies. This can then be taken further by deploying end to end analytics using natural language to help discover and improve interactions in the future.

Vital Market Differentiation

An effective natural language capability allows enterprises to differentiate themselves from their competitors, by enabling their customers to interact with them over multiple communication channels but still receive the same personalized experience.

The Natural Language Opportunity

Natural language

implementations are no longer confined to a corporate website. They need to be deployed on the myriad of devices, platforms and channels that the user chooses, as well as being able to scale and adapt; all while delivering results in any language and co-operating with back end systems. Most importantly it needs to be fast and easy to use and maintain.



Development Considerations

OS and device agnosticism

Tying in to a specific manufacturer or operating system will severely limit development choices in the future, as well as ring-fencing users into a specific environment. To meet today's rapidly changing trends and the demands of users who might simultaneously use different Microsoft and Apple devices, for example, any natural language application needs to be able to persist across different environments, channels and devices.

Scalability

Any solution must be scalable. Implementing a quick win that only comes as a 'closed box' solution without the ability to easily scale and grow is a fundamental error to make, as it means the loss of the opportunity to take advantage of tomorrow's opportunity for the sake of an instant fix today.

Capture and analyze the data

Delivering a better user experience and providing critical trend data on which to build the business requires the ability to capture, interpret and act on the previously inaccessible and impenetrable wealth of natural language information that comes with every interaction of every customer through every channel.

Integration with existing systems

To maximize the opportunities that natural language offers it is important that the development platform enables easy integration into legacy systems such as CRM or Finance, alongside third party systems or other apps.

Ease of Use

In order to avoid lengthy development timescales, escalating costs and highly complex computational linguistics, it is equally important that the platform itself is intelligent and automated, and can be used by business users as an everyday tool.

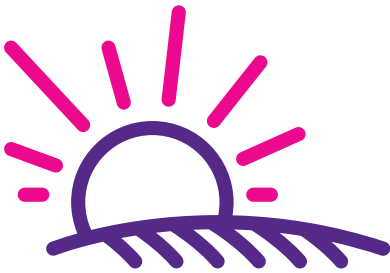
Multilingual capability

A key consideration must be whether it can maximize global use while minimizing duplication of effort to reach that global audience. Being able to create content that is known to be accurate and approved, then immediately re-use, update and maintain it in multiple languages instantly is one part of this – the other being the ability to manage local variances and show real adaptability to local nuances.

App development and data ownership

So far, none of the major technology vendors have shown any sign of opening up their APIs to allow businesses to develop their own applications. Instead enterprises are stuck with whatever pre-installed personal assistants the giants have created for them, regardless of suitability or future requirements.

Allied to the problem caused by being forced to use proprietary solutions is the issue of data ownership. There is little point in being able to see the data if you can't do anything with it. The risk maybe that despite all that investment, the business has no more information than it did when it had nothing but a point and click website. Maybe less. This alone should raise many warning flags.



Tomorrow's World...

By 2020, natural language will be as critical to a business as its website is today, with everyday speech being the norm as the interface. Users will no longer need to tell technology what they like or dislike, the technology will have learned intuitively. Search will deliver results based on a user's personal preferences, external factors and third party partners. No more million-result searches, just answers. Whole networks of connected virtual assistants will deliver a seamless experience for the user, whatever they need, ask for or want to do. A patented intelligent framework already exists to deliver this. Effortlessly accessed using intelligent routing based on implicit personalization, this ecosystem 'snaps' together to create larger applications.

As the future unfolds, it is clear that the controlling factor to interaction between humans and technology will be natural language. It will be instrumental for customers to find and interact with organizations and it will be critical for enterprises to capture data to develop their business.

Enterprises that sit on the sidelines now, will be left in the cold in just five years.



Artificial Solutions has customers and offices around the world.
Visit www.artificial-solutions.com/offices to find your nearest office.

Alternatively, you can find us on social media:



www.linkedin.com/company/artificial-solutions



www.twitter.com/ArtiSol



www.youtube.com/artificialsolution



www.facebook.com/artificialsolutions

About Artificial Solutions

Artificial Solutions® is the leading specialist in Natural Language Interaction (NLI). The company's patented technology enables people to converse with applications and services running on computers, mobiles, wearables and other electronic devices in a humanlike, intelligent manner.

Called Teneo, it is the first complete platform to enable enterprises to rapidly develop and analyze natural language applications that embrace artificial intelligence through the use of machine learning and implicit personalization.

Teneo allows business users and developers to collaborate on creating sophisticated natural language applications in record time that run on any operating system, in 35 languages, without the need for specialist linguistic skills. Teneo also unlocks the knowledge held in immense volumes of natural language conversations, delivering unprecedented levels of big data insight and true 'voice of your customer' understanding.

Artificial Solutions' technology is deployed by hundreds of public and private sector organizations and used by millions of people. For more information visit www.artificial-solutions.com
