

## White Paper

# The Impact of NLI on Connected Consumer Goods

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### Synopsis

The technologies required to create a realistic and usable, Natural Language user experience have matured to a point where they can be applied to any device, not just typically “online” ones. Domestic appliances, video games (not just the consoles), TVs and Sat Navs can all be equipped with NLI capabilities which take any existing “intelligence” and enhance it to exciting new levels of interaction and personality.

This paper reviews the art of the possible with NLI and reveals how tomorrow’s technology can be achieved today. [READ ON...](#)

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# Virtual Assistant

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the power of NLI will put these devices a leap beyond its competition

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### Introduction

It's not just TVs that consumers will soon be able to chat with. The sophisticated chain of events that Natural Language Interaction (NLI) enables is transforming the way all manufacturers of household goods are looking at the future. Many consumer devices are already connected – our games consoles, mobile phones, computers and more already rely on user input to function, whether by specific written, verbal, touch or gestural commands. And some systems, like in-car Sat Navs, and household appliances, are next on the list – allowing the user to engage and interact with them as a multi-functional device, not just a single function, passive tool.

Adding the power of NLI to the mix will immediately put each of these devices a leap beyond its competition, as users realize they can simply tell the device what they want to do, in the way they would tell a friend or colleague. No need to issue precise commands just to access a limited range of functionality, no need to put on a mechanical voice to make it understand you, and no need to put up with what the device has been programmed with – with NLI it uses intelligence and reasoning to think, act and react like a human would.

This is the culmination of a product development path which has led consistently to the door of user enablement and usability. Till recently, the multiple technologies needed to realize this goal were not sophisticated enough to work at a consumer-acceptable level. That is no longer the case and accurate, relevant and intelligent speech-enablement services can be implemented on any connected device now.

NLI enables people to interact with any connected device using the power of everyday speech and language. NLI can interpret the meaning and context of queries and has the intelligence to learn, reason, understand, and then apply this knowledge to respond and react appropriately. It has the ability to answer questions as well as ask its own, and can retrieve information stored within a device or access third party resources – effortlessly and efficiently.

Much more than just voice activation, NLI enables consumer devices and appliances to deliver a realistic, two-way experience that adds tangible and lasting value to the consumer.

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### A TV That Can Answer You Back

Whilst TVs capable of responding to voice commands are already being showcased, they don't offer a true interactive experience. In fact they are little more than a glorified verbal channel changer, in a similar way to the hands-free dialing that has been available on mobile phones for many years – it can only do one unthinking task and only if you say exactly the right phrase, in the right tone. NLI would enable the viewer to talk much more naturally to the TV, and with vast amounts of channels available to the average user, make finding their favorite programs easier too. Intelligent speech-enablement also removes the need for special tools, handsets or remotes – all of which are needed once you move past the headline features on currently available products.

Saying “What’s on tonight?” for example would bring up the on-screen TV guide, but ask “is The Big Bang Theory on at the moment?”, and your TV would understand that you want to watch that specific program now and would either find an episode, or offer the next available start time.

But even this doesn't take full advantage of the intelligence that NLI can offer, nor does it make use of the internet connectivity available on modern TVs. Start to link in third party sites such as IMDB or Wikipedia, and the TV can answer all kinds of questions such as “who’s in the cast?”, “how old is Tom Cruise?” or “what’s that movie that has the girl from Friends in it?”.

This type of intelligent parsing of natural language input is far beyond the capabilities of the first generation of smart devices currently on sale; and opens up the device to be a household ‘hub’ of information and interactivity, not just a quirky gimmick.

In addition, NLI will make it easier for consumers to respond to adverts – perhaps by opening up a webpage or sending off for samples direct from the TV interface. This direct, real-time interaction will revolutionize how advertising is measured and deployed. Who knows, maybe even advertising will become intelligent too!

NLI differentiates itself from a voice command-only TV by providing an interactive experience that enables the viewer to make full use of the convergence between home entertainment and modern computing.



This would deliver a different, more personalized experience to each player

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### Making Video Games Even More Interactive

Whilst graphics and storylines have come a long way, dialog in gaming hasn't changed much in recent history<sup>1</sup>, but NLI has the power to transform this environment. For example, it could be used to allow players to converse with non-playing characters (NPC) in a totally natural way. Intelligent virtual assistants already in use in other industries can keep sales processes on track, and this ability can easily be transferred to gaming by ensuring the player is involved and into the gaming experience at a much deeper level than currently possible.

This would open up conversations, delivering a different, more personalized experience to each player whilst enabling the game developer to ensure the game keeps to the original objectives. It would also be possible to alter the path the player takes depending on the conversation, making branching storylines more natural – and this doesn't have to be just based on words.

NLI is more than speech recognition, it takes into consideration a wide range of emotions based on the context of words and how they are delivered, and delivers a much richer gaming experience where the characters are imbued with individual personalities and awareness.

<sup>1</sup>[http://gamasutra.com/view/news/34144/Future\\_of\\_Games\\_Generating\\_Natural\\_Language\\_For\\_Game\\_Dialogue.php](http://gamasutra.com/view/news/34144/Future_of_Games_Generating_Natural_Language_For_Game_Dialogue.php)

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### Home Appliances That Speak Your Language

Domestic appliance manufacturers are also looking at how NLI can add value to their product ranges, which are often purchased on a commodity, lowest-cost basis. Adding a feature which significantly enhances its usefulness to the end user can only boost sales and desirability, turning them into a more aspirational item, rather than an emergency buy.

RFID technology already offers the potential for the first generation of “smart fridges”, where goods can be scanned in as an inventory, yet this is a one-way technology, still reliant on human intervention to be of actual use. NLI could be used to make it interactive – for example, acting as a ‘live’ shopping list when you use up the last of the milk, which in turn seamlessly integrates with your mobile phone’s shopping list app for when you are standing in the supermarket.

Similarly, if you added “cheese” to the list, NLI will understand that you intend to purchase cheese, and can remind you if you already have a block of it at the back of the fridge. Or you might specify “Parmesan” and NLI will know this is still cheese, but different to “Cheddar” and not need to warn you of the potential “repeat purchase”.

NLI can also integrate with other services, so for example, entire ingredients lists for specific recipes could be added to the list with one click; or it could sync with supermarket home shopping portals, highlighting special offers or even access aggregator sites to display where the items are available at the lowest price. NLI could even group your shopping list into the same departments you’ll find when you walk round the shop in person – no time wasted zigzagging back and forth because the list is disorganized.

# Virtual Assistant

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You: How much time before my next meeting?

“

**Virtual assistant:**  
(checks calendar for meeting time and compares with current time)  
2hrs 20mins

“

You: OK – how long will it take to get there?

“

**Virtual assistant:**  
(remembers meeting time from previous answer, finds location from GPS and consults Google maps and local traffic reports)  
With current traffic it will take  
1hr 30mins

“

You: Great time for lunch

“

**Virtual assistant:**  
(like all great assistants, it's always one step ahead of you and is already consulting the local online restaurant guide using the route it worked out from the previous answer)  
I've found three restaurants on the way – La Tasca, Chez Philippe and The Red Lion – would you like me to book a table?

“

You: No but send a text to Fred to meet me at the second one.

“

**Virtual Assistant:**  
(locates Fred in contacts and sends a text with all the relevant information about their lunch meeting. It then directs you to the second restaurant.)  
Done.

## Not Hands-free, but Eyes-free

Google recently obtained license plates for its first self-driven vehicle<sup>2</sup>; and Volvo has just carried out tests of a self-drive convoy of vehicles<sup>3</sup>. These developments are hailed as offering potentially significant gains in productivity and use of time - ultimately, with driverless engineering, commuters could work on the way to the office, or even have the car do the school run for them! With NLI on board, the car then becomes a cross between an intelligent virtual assistant and Knight Rider's KITT!

Furthermore, a recent Juniper Research report<sup>4</sup> suggests that very soon, most cars will be built to integrate with smartphone technology. This ability will range from the relatively trivial (for example allowing live streaming music from the web), to the more serious (enabling the use of telematics to pinpoint vehicles in case of emergency). The key point is that this functionality will be built into the smartphone, rather than the vehicle itself, making it portable and available in any marque or spec, bringing the technology to everyone, not just those who can afford luxury cars.

Other potential enhancements for motorists could be the introduction of speech-enabled Sat Nav systems, where drivers can request directions to “home” or “the office”; or get directions for point to point locations. Taking this further, the Sat Navs themselves could be integrated with traffic management services, which could proactively alert the user to traffic problems on their journey and offer to re-route them. This proactive assistance removes the stress of being stuck in long queues, or of the driver trying to guess an alternative route whilst still focusing on driving, possibly on unfamiliar roads or even overseas where traffic announcements and road signage will be in a different language.

<sup>2</sup>[http://www.theregister.co.uk/2012/05/08/nevada\\_license\\_google\\_car/](http://www.theregister.co.uk/2012/05/08/nevada_license_google_car/)

<sup>3</sup><http://www.bbc.co.uk/news/technology-18248841>

<sup>4</sup><http://www.forbes.com/sites/matthewdepaula/2012/05/19/in-four-years-most-cars-will-work-with-smart-phones/>

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### About Natural Language Interaction

Natural Language Interaction enables consumers to interact with technology simply by using their own words.

It delivers the intelligence that enables online and mobile virtual assistants, mobile apps, software programs and even smart-devices and appliances - to think, reason and converse in a natural, humanlike manner.

Natural Language Interaction interprets the meaning and context of queries and has the intelligence to learn, reason, understand, and then apply this knowledge to real life interactions. It has the ability to answer questions, retrieve information or access resources, perform e-commerce transactions and much more - effortlessly, efficiently and very cost-effectively.

NLI revolutionizes how consumers interact with devices and appliances providing an intuitive, natural way to communicate with technology.

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## About Artificial Solutions

Artificial Solutions is the leading specialist in Natural Language Interaction (NLI). The company's patented technology enables people to hold two-way meaningful conversations with applications and services running on computers, mobile technology and other electronic devices in a humanlike, intelligent manner.

Typically deployed as web-based Virtual Assistants for customer service and sales, and as embedded speech-enabled applications for mobile computing, Artificial Solutions enables organizations to increase customer satisfaction and direct revenues, whilst reducing costs. Platform and device independent, Artificial Solutions' NLI technology is available in 21 languages and includes powerful analytics that deliver valuable insight into customers' needs and behavior.

With development centers in Barcelona, Hamburg, London and Stockholm and offices across Europe, Asia-Pacific and South America, Artificial Solutions' technology is deployed by hundreds of public and private sector organizations and used by millions of people every year. For more information, visit [www.artificial-solutions.com](http://www.artificial-solutions.com)

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