

Speech Technology in Car Navigation - Luxury Add-On or Indispensable Must-Have?

We asked Paolo Coppo, Loquendo Vice President of Marketing and Business Development, a few questions about Loquendo's position in the market and about one of its best-selling products – the Loquendo TTS Automotive Solution.

Can you give a brief outline of Loquendo and the technology it provides?

“Loquendo is a global speech technology provider and our product portfolio embraces the full range of speech technologies - text-to-speech, speech recognition, speaker verification, voice platforms and embedded solutions for a huge number and wide variety of applications.

“These technologies are available for desktop PCs, telephony servers, smartphones and navigation devices - with the footprint to suit, whatever the requirements of the application.

“Our long experience in the speech industry has allowed us to develop an entirely in-house technology. As a result, all Loquendo technologies benefit from sharing the same core engine across the full product line and for all languages.”

Where are Loquendo's greatest strengths in the markets?

“We have, and always have had, a very strong presence in the telco applications sector, which as a market is already mature and has seen high take-up of speech technologies. In Southern Europe we are absolute market leaders in this sector, and we are very strong in Latin America and the rest of Western Europe.

“A far younger market, but one that is expanding and diversifying rapidly, is the embedded and automotive sector. Loquendo is the world leader in terms of its market share of PNDs with embedded text to speech. This has swiftly become a mass consumer market and both deployments and unit sales are very high – and the fact that consumers now see the Loquendo brand name on many best selling devices, such as the TomTom GO 910, GO x20 series and the recently released TomTom ONE XL-S, has given us a very high profile with end consumers along with high visibility in the consumer electronics market.

“One of our most successful strategies has been to create our highly popular Loquendo TTS Automotive Solution - currently one of our top sellers and set for a still brighter future as the navigation markets continue to expand.

“Loquendo is also seeing extensive take-up in the assistive, visually-impaired and healthcare sectors. It is vital that barriers to accessibility to technology are reduced for the differently able and the elderly. Speech technology has a fundamental role to play in this sector, although it is still early days and awareness of the potential is sometimes lacking.”

There's been quite a buzz about your Automotive Solution. Can you tell me a little bit about it?



"The Loquendo TTS Automotive Solution was developed after extensive market research. The result is an easy to integrate, multilingual, natural sounding solution that has become a landmark in the telematics market and one of Loquendo's best-selling products, found on millions of dashboards around the world.

"A key feature of Loquendo's Automotive Solution is the integration of pre-recorded prompts with text to speech technology. The navigation industry had previously rejected TTS as not up to the job, because quality was poor and because it lacked naturalness. All this changed, however, with the development of Loquendo's emotional TTS – a first for the speech market, it has a high level of expressiveness and naturalness which is unparalleled in the industry.

"The use of text to speech with pre-recorded prompts, therefore, gives our clients the best of both worlds – a database of pre-recorded phrases for giving directions and so on, with our emotional TTS giving additional flexibility for the reading out of traffic announcements, names and addresses, personal messages and mail, even e-books, the list is endless.

Can you explain the advantage of enabling car navigators with speech technology?

"A trend of great significance for the speech industry is that navigation devices and smartphones now come with an exciting, yet sometimes bewildering, array of applications and features, and that increasingly these devices can be linked up with one another. It is clear that this trend is set to continue apace.

"The value of speech technologies in this sector is thus immediately evident, because - and this is the key point - people have now understood that the only truly safe and realistic solution for operating and switching between all these devices is to use the voice. With a speech interface you have unlimited mobility – users are free to get the most out of their on-board devices, but also, and more importantly, they are free to concentrate on driving the vehicle safely.

"It's no wonder, therefore, that speech interfaces are quickly becoming indispensable must-haves, rather than the luxury add-ons they once were, and that consequently demand from the market is very high.

What singles out the Loquendo solution from its competitors?

"The Loquendo solution has many advantages – it is reliable, expressive, and flexible. Its use of text to speech is essential for the reading out of street names and road signs – it would be impossible for a recorded system to correctly read every place or street name in any language, but a text to speech solution can do just that, making use of the many thousands of phonetic transcriptions available with TeleAtlas and NAVTEQ maps. Because Loquendo TTS supports the X-SAMPA phonetic alphabet and the TeleAtlas and NAVTEQ SAMPA variants, the Loquendo Automotive Solution is able to read out any name, address or road sign with the correct pronunciation.

"Furthermore, as the Loquendo Automotive Solution is multilingual, supporting over 20 languages, it has no problem with foreign names and addresses. Since all Loquendo voices can pronounce any foreign word correctly, our American voice Susan, for example, has no problem pronouncing *Plaça de Catalunya* or *Les Champs Elysees*, while still retaining her native accent. This is useful for when travelling abroad, but also for reading foreign street names at home. Again, no pre-recorded solution could manage this.

"The Loquendo solution also has the advantage of footprint flexibility, allowing you to choose from a wide range of compression bit rates, database sizes and sampling rates - from 8 up to 44 kHz. Whatever your system's size or constraints, we can deliver the footprint to suit your needs.

“As I was saying earlier, we are now able to link up more and more gadgets to our in-car navigators – phones, MP3 players, and so on – and an efficient and expressive speech interface is vital if we are to be able to drive safely while still getting the most out of all these devices. It’s no use having your text messages or emails read out for you if the system can’t interpret the many abbreviations and acronyms that we all use to communicate with these days. The Loquendo solution can do this with ease, but it can also read out the message in a style appropriate to its contents – that is to say, in an informal, expressive and entertaining way, rather than in the cold, robotic style of the past.

“Yet such an informal style may be inappropriate for giving directions or reading out traffic news, for example, or for reading out the track list on your MP3 player. Each context requires a different approach, and so navigation systems must be able to differentiate between the various possible scenarios they may be presented with, depending on the user, the journey and the device.

“Flexibility, expressiveness and differentiation are going to become ever more important as the number of gadgets we can link-up increases, and as the variety of sources of infotainment increases. Loquendo speech technologies are excellently placed to meet all these requirements and to adapt to the up-and-coming trends.

“The latest innovation we have introduced into our solution is the ability to adapt to the frequency response characteristics of different speakers and audio chains. A fully programmable graphic equalizer and a dynamic range control can radically improve the audio quality and intelligibility of our voices, given a specific device and usage context. This feature has been successfully tested in the field by Dortmund firefighters in Germany, in the context of the “SHARE” research project.”



“Thanks to the Automotive Solution, Loquendo TTS has been awarded the "Best Innovation in Text to Speech" prize at AVIOS-SpeechTEK West 2007, in San Francisco, for the third year in a row. The AVIOS-SpeechTEK Awards are presented to companies for their innovations in technology, and are chosen by a committee appointed by board members of the American Voice Input/Output Society (AVIOS). We are particularly proud of this clear recognition of Loquendo’s position at the leading edge of speech-synthesis technology.”

Of course, so far I’ve only talked about text to speech technology, but the obvious next step will be the integration of speech recognition technology, as well as TTS, as a standard feature on navigation devices, not only for simple command and control tasks but also for entering addresses. This will further increase safety, by allowing the driver to keep eyes on the road and hands on the wheel. The point is that speech recognition technology is now mature enough for use in car navigation, and Loquendo is ready to catch this wave... but I’ll talk with you about this next time.