



Dragon Drive™

Connected Apps and
Services Platform

An Overview





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Introduction

Recently, Nuance acquired Tweddle Connect, an end-to-end service delivery platform for the connected car. This whitepaper addresses the current core capabilities of this platform, as it is deployed and proven in the market.

The combination of Tweddle Connect with Dragon Drive, Nuance’s hybrid embedded-connected voice platform, provides automakers a single, turn-key solution that offers voice, natural language understanding, dialog management, expressive text-to-speech, in-car connectivity, apps, content, and dynamic application user authentication – all integrated as one holistic offering. Going forward, Tweddle Connect will continue as Dragon Drive.

Company Background

Nuance is a leading provider of voice and language solutions for businesses and consumers around the world. Its technologies, applications and services make the user experience more compelling by transforming the way people interact with information. Every day, millions of users and thousands of businesses experience Nuance’s proven applications and professional services.

The availability of high-powered, cloud-connected portable devices has made the delivery of conversational applications possible. Advancements in natural language understanding research have transformed voice-enabled applications from simple command and control to intelligent applications that can understand the intent of the user’s request, and even answer complex questions.

Nuance drives innovation with over 1,200 voice and language scientists. We see natural communication being the key for intelligent interactions and excellent user experience. Nuance voice and natural language solutions are built on top of the richest and most powerful voice in natural language framework available. This technology framework combines all the powerful elements that are required to create meaningful, natural conversations. Interpreting a broad range of human input—including voice, text, video, and voice biometrics—we can use sophisticated techniques to derive the user’s meaning or desired outcome. Our reasoning capability has the



ability to create natural conversational turns, combine information and evidence to make decisions, and even answer complex questions.

The best way to measure our commitment is through the success of our customers. Our cloud-based systems are now processing over 5 billion mobile transactions annually. Nuance technology is now deployed on over 6 billion mobile handsets and there are over 90 million Nuance powered cars on the market today.

By providing access to our advanced voice capabilities to a broad developer community, we've quickly grown our developer community to over 10,000 partners. These partners are constantly developing and bringing to market a broad set of innovative consumer, commercial, and medical applications powered by Nuance.

Nuance Automotive Business

The Nuance Automotive business delivers automotive-grade speech solutions enabling drivers all over the world to access information and services and providing the safest, smartest and most natural user experience.

Since over a decade Nuance Automotive is committed to drive innovation and meet the automotive industries highest quality requirements. In 1996 Nuance equipped the first car ever with speech input enabling voice dialing. Since then many more industry first followed: 1st line fitted voice destination entry in 2005, 1st one-shot voice destination entry and multi-lingual music search in 2008 and the first in-car message dictation in 2012, just to name a few. Our success is driven by our experience, innovation power and commitment to quality.

Shipping in more than 20 million cars in 2012, Nuance's voice, text-to-speech and natural language understanding solutions power over 90 million vehicles worldwide, including the world's leading brands such as Audi, BMW, Chrysler, Fiat, Ford, General Motors, Hyundai, Mercedes, Toyota, Volkswagen and others.

In hundreds of customer projects we've proven our commitment to quality and our passion for innovation. In order to offer our project partners the best possible support we have constantly expanded our local sites, building up automotive engineering centers in Burlington (US), Seattle (US), Sunnyvale (US), Montreal (Canada), Ulm (Germany), Aachen (Germany), Ghent (Belgium), Zurich (Switzerland), Turin (Italy), Shanghai (China), Beijing (China), Seoul (South Korea), and Tokyo (Japan).

Today's automotive industry is more global than ever. Broad language and regional support is of utmost importance for our automotive customers. Our Automotive portfolio supports all major languages in North America, Europe, Asia and Middle East. Our speech recognition technologies support 30 languages and our text-to-speech portfolio over 40 languages and more than 70 voices.

Tweddle Connect

The newly acquired Tweddle Connect is now part of the Nuance Automotive Business and provides automakers with a fully-integrated, supported, secure platform that enables best-in-class infotainment and vehicle-connected services. The team has proven success integrating automotive-grade quality, highly relevant end user content into mobile environments- linking handset and head unit-- enabling over-the-air updates for drivers, front-end integration for OEMs and dealers, and comprehensive back-end support and reporting. The solutions are built around key tenets such as ease of customer use, OEM developer native UI control, and a familiar safe and secure personalized experience—enabling OEMs to form lasting connections with their customers, and



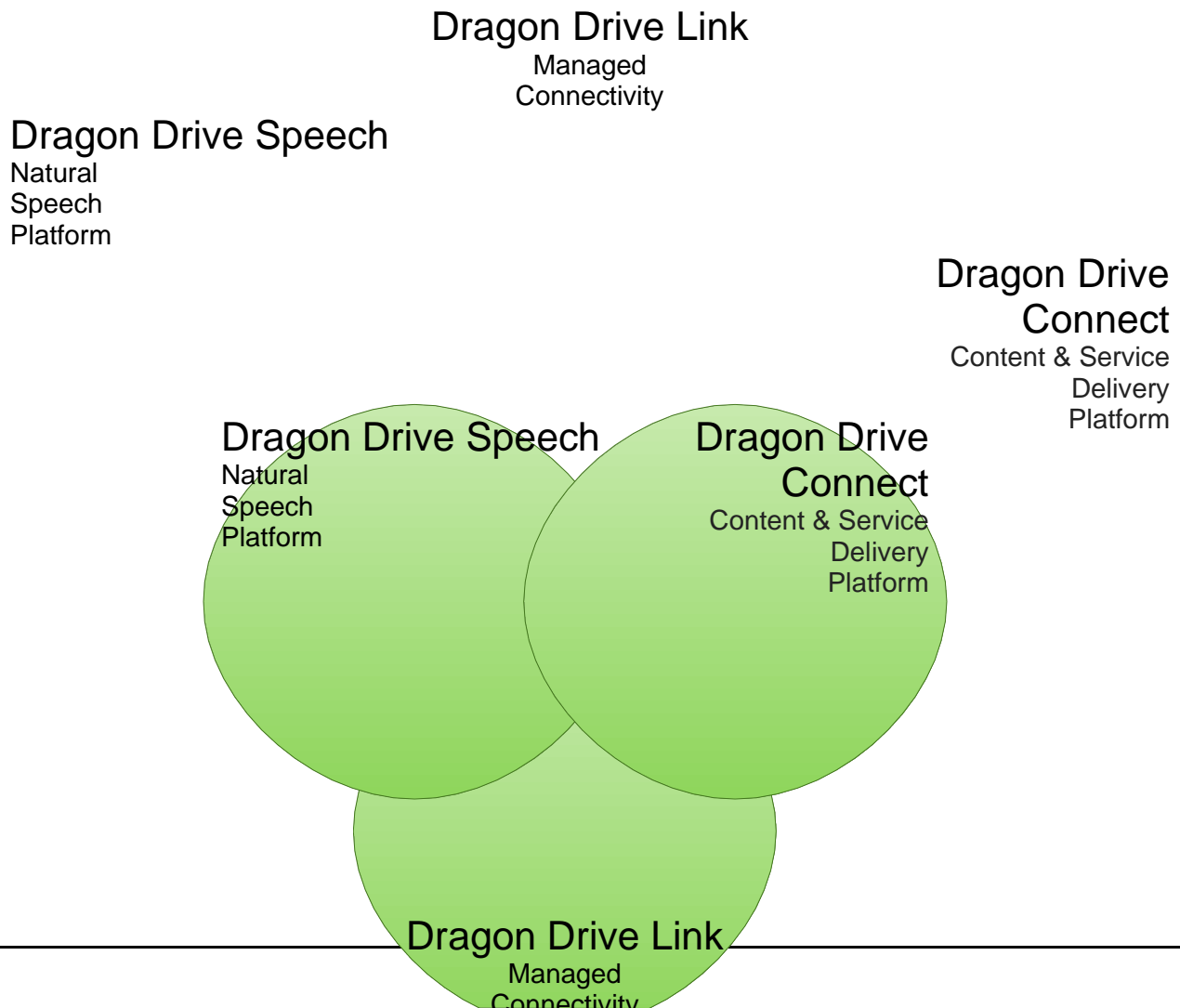
positively impacting owner loyalty and customer retention.

Dragon Drive Platform Capabilities

Nuance’s Dragon Drive voice solution supports a range of functionality like voice dialing, message dictation, navigation, local business search, music search, climate control and more.

Tweddle Connect was developed by Tweddle Group, a leading automotive supplier in the development, management, and delivery of technical information and owner communications, and connected owner solutions for automotive OEMs. It is the award winning platform behind a number of connected car apps and service offerings, like Toyota Entune and Lexus Enform.

The combination of Nuance’s Dragon Drive and Tweddle Connect bridges the current gap between voice, on-board applications, and connected third-party applications and content. See attached spreadsheet for more platform details.





Connected Driver Solutions:

One of the greatest challenges facing the automotive industry is how to provide vehicle owners with the connectivity they want in the safest possible way. Consumers are accustomed to being continuously connected to the web via their mobile phones, computers, and tablets. Given the amount of time spent commuting, the industry is pushed to develop better connectivity solutions that maximize user experience while minimizing driver distraction.

Dragon Drive provides a flexible and extensible voice-enabled cloud-based service that can serve existing and future connected services strategies as well as support the mobility initiatives of marketing, service and customer relationship management. Dragon Drive's end-to-end modular capabilities enable OEMs to select which solutions best fit their unique implementation. Dragon Drive offers:

- Multiple ways to connect to web services according to OEM specific needs
- Over-the-air update capabilities for smartphones and head units
- Native application user experience across multiple devices
- Back-end platform support including user authentication, e-commerce, content connectivity and data normalization, and latency mitigation
- Factory and dealer integration to enable better sales and service
- OEM branding across handset, head unit, web portal and call center
- Financial integration enables reconciliation of licensing and 3rd party service costs
- Comprehensive Service and Usage Reporting

Dragon Drive offers fully-integrated service management and communication solutions for vehicle owners seeking a safe, single-source content, applications, service, and information provider. Nuance manages all aspects of the supply chain in order to deliver services and effectively communicate with vehicle owners as well as sales, service, support and training associates.

HMI Design and Consulting



Unlike other devices through which content is consumed, the ability to provide complementary mobile and in-vehicle experience for interactive commerce, infotainment and driver centric services requires thoughtful insight into driver and passenger behaviors to ensure that the digital experience is delivered safely. Nuance's Human Machine Interaction (HMI) Design group analyzes designs, evaluates and produces interactive OEM recommendations to support mobile and in-vehicle applications. The team of engineers, graphic designers and human factors specialists work with ecosystem partners to craft software environments with applied driver distraction guidelines while maintaining maximum usability.

Business Intelligence

The Dragon Drive platform monitors customer usage, production environment, disaster recovery, and server load balancing on an ongoing basis. Its tracking and data warehousing capabilities provide OEMs with monthly reporting and the potential for deeper analytics from various sources in the future. Reporting capabilities include the ability to track account activation and status, dealer account status, dealer applications usage, service usage of unique vehicle owners and requests to the proprietary transformation engine. A major benefit to automakers is factory and dealer integration, providing more detailed reports on active users, and faster, more personalized service to end users.



Current Dragon Drive Programs

Toyota Entune™ and Lexus Enform™

Toyota's Entune™ platform is a technology eco-system that delivers vehicle-owner centric features and services to the Toyota owner via the web, mobile device and in-vehicle systems.

Entune™ is built to be content-, hardware-, software- and feature-agnostic, enabling Toyota to keep pace with advances in web and mobile technologies, and changes in consumer demands.



Nuance, DENSO, and Harman Becker combined efforts as Tier 1 suppliers to collaboratively integrate this connected services solution for Toyota. Dragon Drive acts as a service broker for key partners and service providers such as Bing™, iHeart Radio, INRIX® traffic, Movietickets.com, OpenTable, and Pandora®.

Nuance's Dragon Drive provides the content management, user management, mobile technology and Bluetooth integration services for Entune™, specifically:

- HMI design & flow for mobile apps
- Mobile application development and maintenance
- HMI design & flow for HU apps
- Content and service supplier management
- Hosting and data transformation management
- Communication protocols between handset and head unit
- Authentication and provisioning of content apps
- API transformation and maintenance to support automotive life-cycle
- Feature aggregation and database management
- Database integration with TMS business systems
- User profile maintenance
- Customer service portal
- Administration portal and reporting
- Tier 2 call center support

Dragon Drive also powers Lexus Enform™ through its relationship with Toyota.

Electric Vehicle (EV)/ Plug-in Vehicle (PHV) Program

Nuance develops and integrates EV-specific apps for Toyota's Plug-in Hybrid and Electric Vehicles. The EV services launched as part of Entune™ 1.5 in the Prius PHV, and will be included in the Rav4 EV launch. Applications include charge management, vehicle locator, charge station locator, eco dashboard, and remote climate activation.



Other Key Customers

The world's leading automotive manufacturers partner with Nuance to benefit from the unparalleled usability, functionality and performance of our solutions portfolio. Our network of partners utilizes Nuance's core technologies to drive business value and differentiate their offerings with the power of speech.



Audi

Audi's MultiMedia Interface (MMI) systems have long featured Nuance's innovative speech technology to optimize driver connectivity and minimize visual and manual distractions behind the wheel. Recent advancements in natural language understanding have allowed drivers to enjoy a more conversational dialogue with their Audi's navigation and entertainment systems through an easy-to-use interface for one-shot destination entry, music search and voice dialing. Now, Audi drivers can enjoy a hands-free messaging experience with Nuance's Dragon Drive Messaging by simply using their voice to dictate and send text messages as well as hear incoming text or e-mail messages.

BMW

Nuance's voice technologies have long been available as part of BMW's infotainment systems supporting a range of capabilities, from simple voice dialing to innovative one-shot destination and music search entry. Now, with Dragon Drive messaging, a new BMW ConnectedDrive feature, drivers can speak, listen, edit and respond to text messages and emails – keeping their hands on the wheel and eyes on the road. To learn more about Dragon Drive Messaging for BMW, visit www.nuance.com/bmw.

Ford

Ford's SYNC® in-car communication and infotainment system has been powered by Nuance technology since it was first released in 2007, allowing drivers to make hands-free telephone calls, control music and perform other functions with the use of voice commands. SYNC functionality has since been optimized with Nuance's new voice recognition capabilities that can accurately interpret the intent of spoken commands. By interpreting or understanding the user's request, SYNC can execute the command or respond by coaching the user down the correct



command pathway. Over 5 million Ford vehicles have been equipped with Ford SYNC between 2007 and 2012. Consumer acceptance and usage of voice control in the car continues to increase, with more than 85 percent of SYNC owners now using voice control while driving, up from 70 percent in previous internal research.

Strategic Partners

Nuance understands the importance and value of maintaining foundational relationships with eco-system partners to achieve the objectives of its customers. The team works with automakers, suppliers, and partners to deliver the features and services defined collaboratively. Nuance has established contractual business relationships with major location-based service, infotainment, and driving-centric service providers.



Nuance enables these content providers to extend their service reach into vehicles, with minimal effort or auto industry experience. Unlike other suppliers, Nuance manages the entire integration process, including design, support to automakers and head unit manufacturers-- provisioning, updates, and back-end support.

Key advantages of working with Nuance include:

- Expanded reach to new and existing customers' in-vehicle environment with minimal investment.
- Abstraction from automaker product lifecycles.
- Platform flexibility that supports all standard protocols and programming languages.
- Strong global organization with local R&D and professional services support.



Nuance is a trusted partner of the world's leading head unit manufacturers, head unit software and embedded operating system (OS) providers, systems integrators, and deal management system vendors to provide these partners and automakers with seamless, customized solutions.





The Future Connected Car

The future success of the connected car is predicated on the ability to seamlessly integrate connected services and voice technology, minimizing driver distraction and increasing vehicle owner productivity and enjoyment. The combination of Nuance's Dragon Drive and Tweddle Connect bridges the current gap between voice, on-board applications, and connected third-party applications and content.

Dragon Drive will deliver "best of breed" services with superior voice technology that leverages embedded, connected, and natural language voice recognition. With the addition of features such as voice dialing, message dictation, hybrid voice-enabled navigation, improved local business and music search to the platform, Dragon Drive can enable its customers to be ranked amongst the most successful in-vehicle connected service systems in the world.

Nuance believes the HMI of the future is not only connected, but also multimodal, intelligent, and deeply personalized. Voice, motion, touch, biometrics and handwriting technologies form the backbone of the future car HMI. Automotive services will be deeply personalized and built around the "mobile context" of the driver, i.e. the car takes into account driver's location and driving situation as well as personal preferences and behavior. As many of the tasks drivers perform are travel-related, automotive HMI that is tailored for top performance in off-board and on-navigation, real-time traffic and weather information, vehicle diagnostics, and messaging are of paramount importance. Nuance's connected services platform and superior voice capabilities will put OEM customers at a distinct advantage.

User profiles and data will be shared across cars, mobile devices and consumer electronics. Drivers will expect the same, familiar interface across all devices and vehicles, rendering Nuance well-positioned to deliver the best experience with existing user authentication and management capabilities. As cars are being shared by several (or even many) drivers, fast and reliable driver identification using voice biometrics and an HMI personalized to drivers' preferences will become important.

Lastly, Dragon Drive supports all known connection strategies, providing flexibility of OEM business model. Over-the-air update capabilities enable the ongoing release of new features and user interface improvements, so drivers can continuously upgrade their systems without visiting a dealership.