

New Voice Interpretation Techniques Leverage
Existing Mobile Services Infrastructures and Improve
on Traditional Server Based Systems.

*A Voice-Insight and Oracle White Paper
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EXECUTIVE OVERVIEW

Specialized voice recognition systems for “hands and eyes free” order selection in high volume distribution center environments have proven their value in terms of streamlined material handling processes, error reduction, speed of execution and ease of use. However, a new approach is needed to economically bring the benefits of voice to lower volume, more heterogeneous application environments and to leverage from existing mobile application infrastructures.

The task management method, traditionally employed in today’s “voice picking” applications, uses a central warehouse management system (WMS) that generates work units, or tasks, which are served up to a central voice server for completion. The end user devices are dedicated, specially tasked “voice terminal” devices that are typically separate from any existing enterprise mobile infrastructure. The cost and complexity of deploying such specialized, proprietary devices and custom server (middleware) solutions is often justified in a single, high volume process like order picking at large retail and distribution centers where a repetitive task cycle is simple and exceptions are rare. However, a more flexible and economic voice solution is now available for use in heterogeneous mobile environments.

A Hybrid Approach to Voice: By leveraging the emulator as a voice interpreter on a mobile device we now have the possibility of improving both the performance and the flexibility of voice solutions at a lower overall cost. This approach leverages gains in speech recognition and interpretation (using speaker independent recognition and complete text to speech processing techniques) to expand system capability and reduce deployment complexity for building out efficient, flexible and economical solutions.

The combination of Oracle mobile enterprise applications with voice interface technology from Voice-Insight reflects this approach, and promises to magnify the benefits of voice (productivity, accuracy, and labor management) in traditional, high volume, centralized order selection situations and extend them to a variety of other mobile logistics and service environments.

The traditional approach to voice implementations relies on specialized voice application servers and dedicated end user voice terminals. This is a relatively complex and expensive method suitable for only the high transaction volume environments.

THE VOICE SOLUTION FOR MOBILE APPLICATIONS

Firstly every respectable applications provider – be they in the Warehouse Management, Manufacturing Execution, or Field Services area - has a mobile client product. The mobile product has an equivalent task inquiry, dispatch and completion workflow which merely uses the mobile handheld terminal as a universal interface to the task framework of the WMS or other application. By layering the voice solution on top of the mobile application, deployment is made simpler, maintenance cheaper, while customizations made to update and synchronize tasks and work units from the would-be voice server to the WMS become unnecessary, having been abstracted by the mobile application. This significantly reduces the costs of adoption and increases the potential ROI.

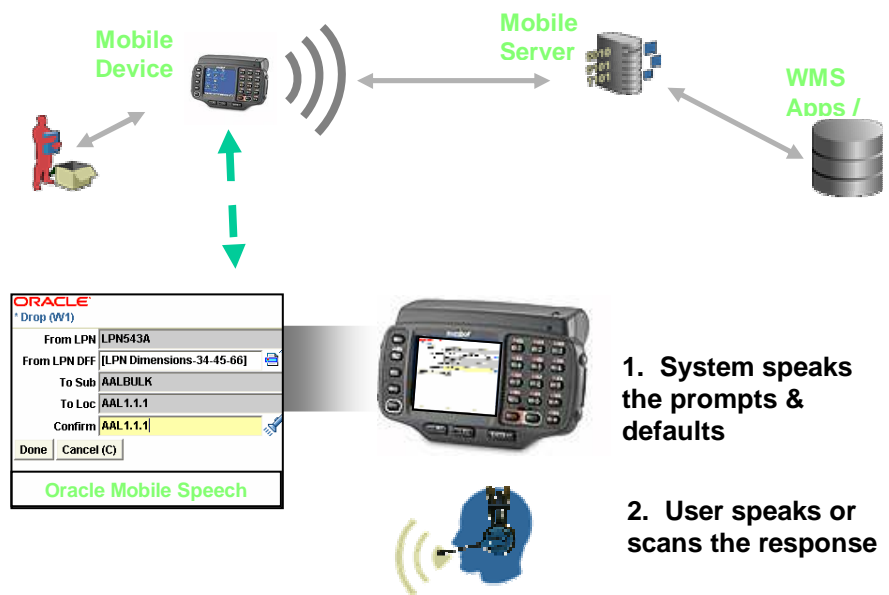
By using the existing mobile infrastructure, additional hardware expenditure is avoided and retraining, upgrades and maintenance are confined to existing units & infrastructure.

Moreover, by designing for flexibility, mobile application user interfaces are customizable for both workflow and data represented through mobile personalization, often simplifying the interface by the intuitive ability to directly jump to relevant screens and input fields or retrieve data using natural voice commands.

This kind of voice interface platform also allows for the symbiotic existence of multiple Auto-ID processes. It allows multi-modal operation where voice is used along with scanning or data entry, especially when there is variability in processes. Additional adoption of RFID or RTLS as data inputs into operations can also be flexibly configured.

Layering the voice interpreter on top of the mobile application eliminates middleware and allows voice based user interfaces to be deployed over existing mobile services infrastructures.

Advanced voice interfaces leverage multimodal, multipurpose mobile devices. They complement and/or integrate auto-ID methods like scanning or RFID for maximum process flexibility and efficiency.



THE VOICE SOLUTION FOR TRADITIONAL TASK BASED PROCESSES

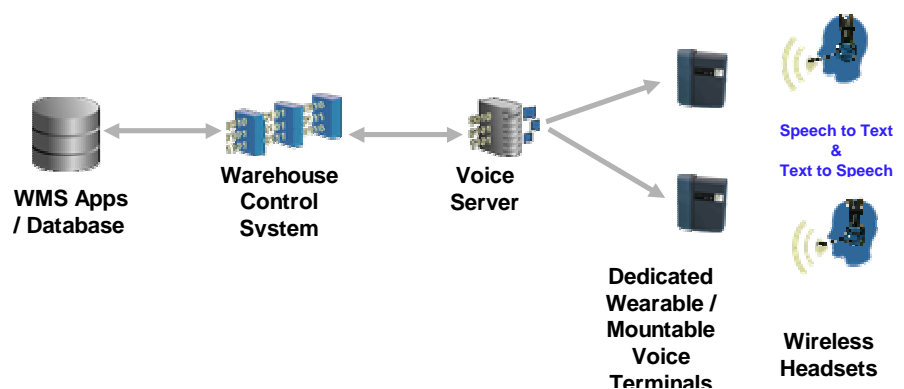
In the event that there is a need for adopting standardized processes and work units to a voice enabled workflow, the task based solution offers an efficient and scalable solution. This is a proven approach for high volume operations where task streamlining and total hands free operations are required. This solution involves cuing and synchronizing completed tasks with a centralized voice task management server. This approach has the added capability of real-time messaging to individuals for alerting and managing errors.

The same, natural language interpretation, speaker independent recognition and full text-to-speech synthesis approach used in the mobile client solution also leads to more flexibility in high volume task based processes in terms of vocabulary, worker dialogs (esp. exceptions handling), training and help levels. The dialogs can be adjusted any time by the user organization using standard database or XML approaches.

This opens the possibility to apply voice to work flows with richer vocabulary and dialog requirements than the typical order picking scenario. These include work routines in returns processing/sorting, QA, inventory, or OSHA vehicle inspections (of forklifts, etc.). Operators can access records by saying product or customer name, address and capture qualitative as well as quantitative information. For example, one can say in a returns center “12 pack of Stella Artois, 16 ounce, one broken, two missing” to log the returned item as received.

With the right tool set, the voice interface deployment benefits from an open programming environment, compatible with COM, .net regimes as well as JAVA, XML and other web oriented approaches. On the server side, any communications protocol (MSMQ, MQ series...) can be used to support both synchronous and asynchronous communications.

The latest speech synthesis and interpretation approaches also expand communications, device, and process options in server based deployments.



A HYBRID APPROACH INCREASES THE REACH OF VOICE

By adopting and supporting both approaches Voice-Insight and Oracle now offer customers the option to deploy dedicated mobile voice-terminal (traditional, high volume solution) or, generic mobile terminal based (voice emulator based, low-volume solution) solutions throughout their operations. This allows for a selective operation, location and category specific solutions and not just a limited, expensive, “one size fits all” solution. In certain industries and operations where the need is not strictly for streamlining but rather environmental (e.g freezer and cold storage), security and safety constraints (e.g. pharmaceuticals handling) or just the convenience of hands free application usability, Oracle Mobility and Voice solutions with Voice-Insight fit all these needs.

Voice is no longer just a high volume, “one size fits all” affair: new approaches offer the economy, flexibility, and performance for almost any mobile application situation.

Mobile Enterprise Deployments - *Voice Enabled Oracle Mobile Client.*

Operations with a relatively small number of user transactions (e.g. order selection, inventory move, goods receiving), multiple functions and perhaps only a handful of users call for a simple deployment resulting in lower overall costs.

- a. Commands and data fields on the mobile client application are automatically voice enabled.
- b. Customers leverage their existing mobility infrastructure – multimodal devices and centralized applications
- c. Any mobile client application can be voice enabled in this manner including receiving, QA, inventory, equipment inspections, work orders, etc., all using the same mobile terminal hardware

High Transaction Volume Deployments – *Optimized Voice Processes*

For high transactional volume environments with highly standardized task cycles (e.g. order picking) a more tailored approach is appropriate.

- a. Task driven work flows are optimized via voice dialogs
- b. Synchronous processing with the WMS (for shipping, receiving, inventory, etc.) can be used
- c. Integrated voice and scanning can further streamline tasks and improve accuracy
- d. Natural language directed exceptions handling procedures save time and supervisory effort

LEVERAGING OTHER TECHNOLOGIES WITH VOICE

The hybrid approach to voice deployments described here take advantage of the latest mobile devices and data capture technologies available including wireless headsets, cordless scanners and RFID readers, emerging rugged XP terminals, and more. The resulting system configuration flexibility further expands the deployment possibilities and facilitates process optimization in traditional settings.

Standards based hardware and software compatibility increase configuration options, like using wireless scanners and headsets with the mobile device mounted on the fork lift...

- Multimodal configurations
 - Advanced speaker independent voice technology is now available on industry standard, voice ready handheld, wrist or waist worn RF scanners
 - The voice interface can integrate the use of barcode scanning wands tethered to vehicles, mounted terminals and PC's
 - Cordless scanner, RFID reader, printer, options further improve voice integration of processes in returns processing, asset management, field service and the like.
- Wireless headsets increase reliability and voice terminal deployment flexibility.
 - The terminal can be mounted on fork lifts, fixed at the end of isles, or worn on the person. Powering the voice terminal from the forklift eliminates costly system & battery handling and administration, battery replacement and charger accessories.
 - A common failure point in traditional voice systems, the headset wire, is eliminated.
 - Users can move within a fixed radius of the terminal (20 to 90 feet depending on the class of device) with increased agility (no terminal/harness to wear).
 - The latest terminals support simultaneous use of wireless headsets and cordless scanners, printers, and other BlueTooth compatible devices.
- XP based mobile terminals
 - A new generation of rugged, low cost XP terminals makes client device and application management easier.

CONCLUSION

Traditional voice recognition solutions based on central voice application servers and specialized voice terminals are generally suited for the only high transaction volume, simple voice-dialog operations of order selection processes in large product distribution centers. However, recent advances in voice technology enable a new, hybrid approach that extends the inherent benefits of voice to a wide range of operations.

Voice application interfaces can now be installed without middleware over existing mobile services infrastructures using a mobile voice client layered on top of the mobile application, a scheme suitable for small warehouses, manufacturing, field service, etc.

High volume deployments, where cost and process optimization drive ROI, benefit from the flexibility of speaker independent voice interpretation techniques combined with the latest wireless devices (cordless scanners, wireless headsets, multimodal terminals and peripherals) and easy dialog programming by the end user organization.

ABOUT VOICE-INSIGHT

Warehouse managers need to constantly improve throughput speeds, minimize shipment errors and manage a changing work-force of diverse abilities and linguistic backgrounds.

Voice-Insight delivers voice enabled logistics solutions of unparalleled flexibility and performance in mobile environments where users require intuitive, hands and eyes free interaction with applications. Its products are used by corporations and consumers around the world in warehousing, asset inspections, navigation and infotainment, geographic information systems, and consumer entertainment. Voice Insight is headquartered in Brussels, Belgium with offices in the USA, Germany and Netherlands and has a development partners and distributor network serving these and many other geographies.

ABOUT ORACLE

Oracle E-Business Suite enables companies to efficiently manage customer processes, manufacture products, ship orders, collect payments, and more – all from applications that are built on unified information architectures. This information architecture provides a single definition of you customers, suppliers, employees, and products -- important aspects of your business. Whether you implement one module or the entire Suite, Oracle E-Business Suite enables you to share unified information across the enterprise so you can make smarter decisions with better information.



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