RP Voice Solution

The RedPrairie Voice Picking Solution

Overview

This guide provides an overview of the RedPrairie voice solution and its capabilities. It also describes the integration requirements for an outside vendor to plug into the RedPrairie Voice Direct system.

In This Guide

General Concepts

How Does it Work?

Assignments for picking or other warehouse processes are generated by the WMS and communicated to the voice vendor using an IP/Port socket based message solution. The voice vendor is responsible for all voice-to-text translation that directs operators to an aisle/section and location from which to pick.
Operators confirm locations by speaking a numeric identifier (called a check digit) into headsets. For additional accuracy, operators may be requested to speak a product verification code, LPN, lot code or other inventory attribute. Certain in-line activities may be requested like count near zero or count back, as well as serial number capture or item weight capture. Upon successful completion of picks the operators are instructed to deposit locations.

Benefits of a RedPrairie Voice Direct Solution

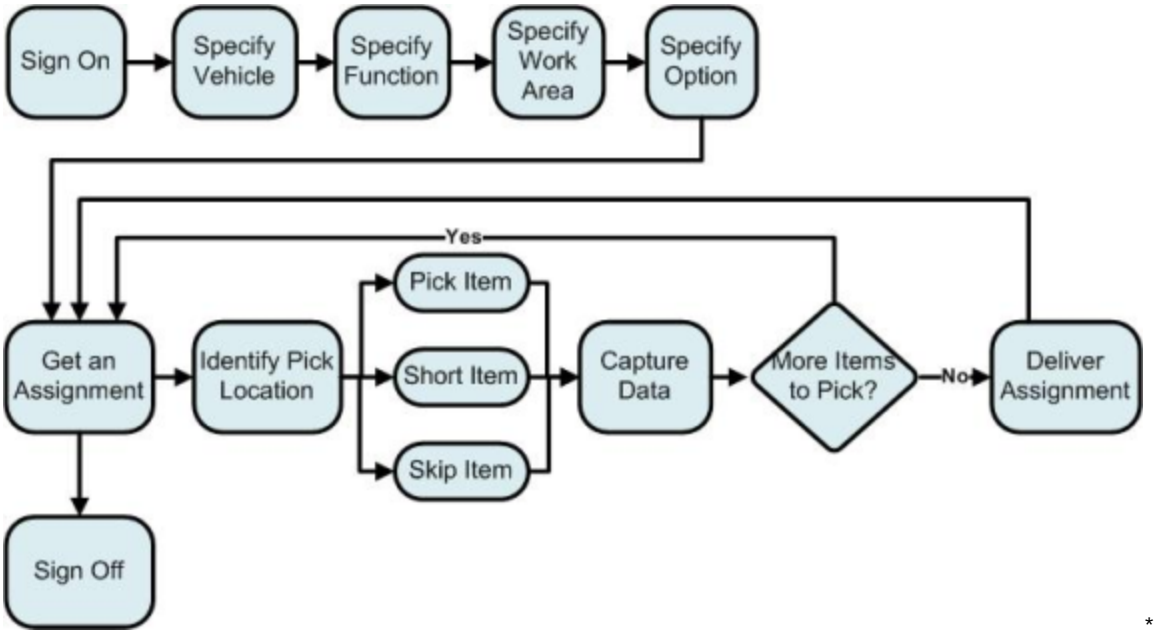
Organizations can realize these benefits:

- **Eliminate paper picking:** Operators no longer have to scan lists and scratch off items with a pen or pencil; they can concentrate on the task at hand. Operators listen and speak as they move through the solution and use their hands and eyes to identify, select, put and pack items.
- **Improve accuracy:** Operators must provide either location check digits or a product verification code to ensure that they are picking the correct product at the correct location. This can greatly decrease the chances of product being selected from the wrong location.
- **Real-time notification of empty locations:** This feature increases the chances that an operator can replenish a location before another operator attempts to pick out of that location.
- **Hands-free, eyes-free operation**: This ability provides ergonomic and safety benefits. The voice headsets are designed so operators can readily hear announcements, alarms and other workplace sounds while listening to the instructions provided in real-time by the WMS.

The Voice Picking Workflow

Description

Picking is the process of picking product from one or more warehouse locations within an assignment. The product is compiled into an order that is usually shipped out of a warehouse. Picking can be configured to support several different types of picking to include case to pallet, each or detail picking, list picking and pallet picking. These types of pick options can be performed in a directed manner or manually. The benefit of directed picking is that you let the WMS decide what the next best pick-task is for the operator.
This image is the typical process flow for the picking process.



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Sign On - Operators are prompted to sign on at the beginning of the process. Operators are assigned a unique operator ID before they can use the system. When operators sign on, the system verifies the spoken password to ensure that it matches the password that corresponds with their operator ID.

Specify Vehicle - The system can be configured to prompt operators for a vehicle type and vehicle ID. This feature can provide valuable data about vehicle usage. In addition to tracking vehicle usage, the system can be configured to direct operators through one or more vehicle safety checks, where each check is determined by the WMS.

Specify Function - The system prompts operators to specify which function they are performing. Examples of functions that can be specified when running picking include case picking, cluster picking, bulk cluster picking, list picking and directed picking.

Specify Work Area - The system prompts operators to specify the area in which they are going to work.

Specify Option - After operators specify where they are working, operators are prompted to specify a picking option. Options define how picking is done in one or more areas of the distribution center. For example, options can include load transfer, cluster picking, bulk cluster picking, conveyor cluster picking, list picking, undirected picking and directed picking.

Get an Assignment - Operators receive one pick in an assignment at a time.

Identify Pick Location -This is the first step to process a pick. The voice system directs operators to a pick location using a series of directions, such as "zone 3, aisle 22, location 33". Operators must provide either location check digits or a product verification code to ensure that they are picking the correct product at the correct location.

Pick/Short/Skip - Operators can pick the entire quantity specified, pick part of the quantity specified (shorting), or skip picking the item. The system assumes the skipped item will be picked before the assignment is completed.

Capture Data - The WMS can flag individual pick items and require that operators capture specific data about the flagged items. Operators may be requested to capture a lot number, serial number, revision code, origin code, supplier number, or a specific item's weight.

More Items to Pick - The WMS sends the next item in the pick list.

Deliver Assignment - After operators either pick or short each item in the pick list, they are directed to deliver the assignment to a particular location. Operators can then indicate that they want to perform another assignment.

Load Assignment - After operators pick each item in the pick list, they are directed to load the assignment onto the truck. Operators can then indicate that they want to perform another assignment.

Sign Off - When operators are finished working for the day, they sign off from the device. This option is typically a sub-step from during the option to pick an assignment; however, operators are allowed to sign off practically any time during the picking process.

Initial Operator Workflow

Description

An operator must navigate through a number of prompts and commands to begin an assignment. The exact workflow a voice operator is subject to depends on configurations made in the Warehouse Management system.

Sign On: Determine Who is Using the Device?

Operators must sign on to a device before they can begin any voice-directed work.
Before any prompts are spoken to operators, the voice device sends a configuration message to the WMS. This message retrieves all site-level configuration parameters that the voice application may need during the course of the process flow execution.
At this point the voice device can send the Break Types data message to return all valid break types that can be specified by an operator during the course of picking. This information is later provided to the RedPrairie Workforce Management system if labor is being tracked.
The voice device then displays a welcome message to the operator, and also sends the sign on information to the WMS to verify the operator's credentials. If the password is valid, the process continues to the next step in the process flow; if the password fails, the operator cannot continue.
If the WMS indicates that the operator must capture a starting location, the operator is prompted for the location ID and check digits for that location. The operator may either speak or scan the location ID.
After operators have successfully signed on to a device and specified a starting location, a list of valid printers is retrieved from the WMS to be used later if in-line printing is to take place.

Specify Vehicle: What Vehicle, If Any, Are Operators Using?

Many operators use forklifts, pallet jacks, or other vehicles while performing warehouse functions.
Before prompting operators, the voice device sends the Valid Vehicle Types message to the WMS to retrieve all the vehicle types that the operator is allowed to use. When the WMS responds, one of these actions occurs:

- If no vehicle types are returned from the WMS, the process flow moves on to the specify function step.
- If one or more vehicle types are returned from the WMS, the voice system prompts the operator for a vehicle type. When the operator responds, the voice system determines whether the operator's spoken response matches a vehicle type returned from the WMS. Operators cannot continue until they specify a valid vehicle type.

Operators can request to hear one or more valid vehicle types by speaking the Description command. See *Informational Commands* later in this guide.
The voice system then determines if it should prompt for a vehicle ID when operators are using the specified vehicle type. This preference is returned in the Valid Vehicle Types message for each vehicle type. Based on this preference, one of these actions occurs:

- If the voice system does not prompt operators for a vehicle ID, then the voice system sends the Send Vehicle ID message to the WMS and moves on to the next step in the process flow. In this scenario, this message is sent solely to inform the WMS which vehicle type was specified by the operator.
- If the voice system prompts operators for a vehicle ID, when the operator responds, the voice system sends the spoken vehicle ID to the WMS in the Send Vehicle ID message.

The WMS response to the Send Vehicle ID message contains any safety checks that should be performed on the vehicle. For each safety check, the voice system asks operators whether the check passes or fails, these are controlled by user-configurable workflows within the WMS. Operators cannot continue until a vehicle passes all safety checks.

Specify Function: What Are Operators Going to Do?

Functions are warehouse processes that are supported by Voice-Directed Work. For example, picking and replenishments are functions that can be directed with voice.
Before prompting an operator, the voice system sends the Valid Functions message to the WMS to retrieve all the functions that the operator is allowed to perform.
The WMS response to the Valid Functions message results in one of the following:

- If no functions are returned from the WMS, the voice system speaks an error message and forces the operator to sign off.
- If one function is returned from the WMS, the voice system states the function description and moves on to the specify region process flow.
- If more than one function is returned from the WMS, the voice system prompts the operator for a function. When the operator responds, the voice system determines whether the operator's spoken response matches a function returned from the WMS.

Operators cannot continue until they specify a valid function. Operators can request to hear one or more valid functions by speaking the Description command. See *Informational Commands* later in this guide.
After the function is specified, the process flow moves to the Specify Work Area step.

Specify Work Area: Where are Operators Going to Work?

If there is more than one work area in which an operator has permission to work, the device offers the operator a list of work areas to choose from.
Before prompting the operator, the voice system sends the Get Work Areas message to the WMS to retrieve all the work areas in which the operator is allowed to perform the specified function.
When the WMS responds to the Get Work Area message, one of these actions occurs:

- If no work areas are returned from the WMS, the voice system states an error and forces the operator to sign off.
- If only one work area is returned from the WMS, the voice system sends the Region (Option) Permissions for Work Type message to the WMS to retrieve the valid options.

- If multiple work areas are returned from the WMS, the voice system prompts the operator for a work area. The operator responds with a numeric work area ID, and the voice system validates that the operator's spoken response matches a work area returned from the WMS in the Work Area message. Operators cannot continue until they specify a valid work area. Once a valid work area is specified, the voice system goes onto the Specify Region (Option) workflow.

Operators can request to hear one or more valid work areas by speaking the Description command. See *Informational Commands* later in this guide.

Specify Option: How are Operators Going to Work?

Options define how picking is done in one or more areas of the distribution center. Options correspond to different ways to perform a warehouse function.
Before prompting the operator, the voice system sends the Region (Option) Permissions for Work Type message to the WMS to retrieve all the options for which the operator is allowed to perform.

Note: The system performs a check at this point to ensure that the operator does not have in-progress work for another option or function. If so, the operator is forced to complete that work. If not, the process flow continues on. A similar check is performed just before an operator gets an assignment.

When the WMS responds to the Region (Option) Permissions for Work Type message, one of these actions occurs:

- If no options are returned from the WMS, the voice system states an error and forces the operator to sign off.
- If only one option is returned from the WMS, the voice system sends the Picking Region (Option) message to the WMS to retrieve the parameters for that option.
- If multiple options are returned from the WMS, the voice system prompts the operator for an option. The operator responds with an option ID, and the voice system validates that the operator's spoken response matches an option returned from the WMS in the Region (Option) Permissions for Work Type message. Operators cannot continue until they specify a valid option. Once a valid region is specified, the voice system sends the Picking Region (Option) message to retrieve the parameters for that option.

Operators can request to hear one or more valid work areas by speaking the Description command. See *Informational Commands* later in this guide.
After the voice system retrieves the parameters for the selected option, it sends the Lookup Values message to obtain valid discrepancy codes from the WMS.

Get an Assignment: What Unit of Work Are Operators Going to Pick?

Description

An assignment is a group of picks that should usually be picked at the same time and kept together. The picks in an assignment are typically shipped out of the warehouse at the same time and sent to the same destination. These can be passed from the WMS in a form of a pick list, single case pick assignments, cluster pick assignment and full pallet assignments.
In this step, the voice system

- gets one or more assignments (automatically or manually)
- retrieves assignment information
- retrieves pick items, and
- summarizes the assignment.

Get Assignment

The voice system checks if assignments are issued automatically by the system or if the operator can manually request an assignment. Whether assignments are issued automatically or requested by the operator is determined by system configurations.
Once an assignment(s) is assigned to or requested by an operator, the voice system sends the Get Assignment message to get all the assignment-level information for the assignment(s) from the WMS.

Automatic Assignment-Issuance Flow
Before the voice system automatically issues an assignment, the voice system verifies whether the operator is allowed to get multiple assignments. This parameter is set by option.

- If the operator is only allowed to get one assignment, the voice system retrieves the assignment information for a single assignment.
- If the operator is allowed to get multiple assignments, the voice system asks the operator for the number of desired assignments. The operator's response must be less than or equal to the maximum number of assignments allowed for the option. If the spoken number does not exceed the maximum allowed for the option, the voice system retrieves the assignment information for the specified number of assignments. There are some limitations with this function driven by the WMS.

Getting Filtered Work
If the option is configured to assign work automatically and to filter work, the operator is prompted for

- building
- work zone, and
- aisle.

The operator can say "pass" at each of these prompts. If that happens, the voice system uses the value from the previous time the operator was at the work area prompt. Null is a valid return set for this value.

Manual Assignment Flow
Operators manually request an assignment by specifying a work ID(s), which is defined by the WMS. A work ID may be whatever value the WMS decides to use for requests such as a List ID, Work Assignment Value or LPN number. The work ID does not have to be a unique value among records in the WMS because the voice system flow handles the scenario in which an operator specifies a work ID that returns several records from the WMS.
A work ID may be scanned or spoken to retrieve work in manual assignment mode. When spoken, the operator responds with a number of digits of a work ID that make that work ID unique. The voice system confirms the work ID and upon confirmation, sends the Request Work message to search for that work ID in the WMS.

Note: The number of digits that must be spoken to identify a work ID is configurable by region. In most systems, the digits spoken for a work ID are matched to the last specified number of digits of work IDs in the WMS database (that is, the right-most characters of this field). For example, if an operator requests work ID 123, the system matches that value to the work ID 8374123. The WMS controls this.
The search returns one of the following results:

- If no matching work ID is found, the voice system informs the operator and re-prompts the operator for a work ID.
- If multiple matching work IDs are found, the voice system offers to say the list of matching work IDs. The operator can loop through the list of work IDs until the operator selects one. If the voice system reaches the end of the list of work IDs, the voice system returns to the beginning of the list. This process continues until the operator cancels the process or selects a work ID.
- If one matching work ID is found, the voice system confirms that the work ID is correct. If the operator is allowed to manually request multiple work IDs, this process is repeated until the operator specifies that the requested work IDs are sufficient, or the maximum number of work IDs is requested by the operator, as specified by the region parameter. Once all of the work IDs have been requested by the operator the voice system retrieves the assignment information.

Summarize the Assignment

After the operator receives the assignment(s), the voice system gives a summary of the assignment, if assignment summaries are spoken for this option, as set by the option parameter. If the option is configured to use the default assignment summary, the following information is spoken for each assignment:

- Position of the assignment, if the operator is picking multiple assignments at once.
- ID of the assignment.
- Goal time, if populated with a value > 0 in the Get Assignment message for this assignment. This is relevant if the RedPrairie Workforce Management solution is used.
- "Say ready".

If the option is configured to use the override assignment summary, different information may be spoken as determined by the WMS.
Asset types are requested from the operator when an assignment is summarized. Assets are pallets or totes driven by the WMS.

Identify Pick Location: Where is the Next Pick?

Description

The picking process guides the user through locations and items in a pick list and continues through each pick until the process is complete. The first step of this process is to identify a pick's location. In this step, the voice system

- directs the operator to a location
- speaks the pick prompt, and
- confirms that the operator is picking the correct product at the correct location.

Voice System Directs Operators to a Location

The first step required to process a pick is to identify where that pick is located. To accomplish this, the voice system directs the operator to the location of the next pick.
The directions to a picking location may consist of a pre-aisle direction, aisle, post-aisle direction and a location. The pre-aisle direction and post-aisle directions are generic prompts where the WMS can send any direction, such as "zone 4, bay 33, aisle 4." Upon reaching the correct pre-aisle direction, aisle, and post-aisle direction, the operator responds by saying "Ready."

Voice System Speaks the Pick Prompt

The final direction to a pick location is the location. This is spoken as part of the pick prompt. An option can be configured to use any of these pick prompts:

- **Single Prompt** - The voice system prompts the operator with the location and the quantity to pick in one prompt.

- **Multiple Prompts** - The voice system prompts the operator with the location and waits for the operator to respond with the appropriate response to confirm the pick location. The operator cannot continue until the appropriate response is provided to the voice system. Once the pick location is confirmed, the voice system prompts the operator with the quantity to pick.

In addition to location and quantity, the operator may be directed to a specific LPN, Lot, Origin, Revision Code and Supplier Number.

Voice System Confirms Operators are Picking Correct Product at Correct Location

For each type of prompt, operators confirm that they are picking the correct product at the correct location by specifying either the location check digits or product verification ID.
If product verification check digits are sent to the voice system for a particular pick, the voice system expects the operator to provide that value, even if location check digits are also sent to the voice system for that pick. If the operator specifies the location check digits in this scenario, the voice system asks the operator if it is a short product. Operators must speak or scan the appropriate response before they can proceed.
The voice system accepts one to five digits for spoken product verification or location check digits or up to 50 characters for scanned product verification check digits. If product verification or location check digits are not sent to the voice system for a particular pick, the voice system accepts the word "Ready" to proceed to the next pick. For product verification or location check digits that are one digit long, the voice system accepts a single digit followed by the word "Ready." For product verification and location check digits that are two to five digits long, the voice system accepts that number of digits as the proper response.

Pick, Short, or Skip Pick Item: How Much Are Operators Picking?

Description

After operators are directed to the appropriate pick location, they can take these actions:

- Pick the specified quantity.
- Pick a quantity that is less than the specified quantity, referred to as shorting.
- Skip picking the item.
- Cancel the pick.

Note: If the spoken quantity picked is more than the quantity to pick, the voice system notifies operators that the quantity picked is too great. Operators are forced to enter a quantity that is less than or equal to the quantity to pick.

Pick the Specified Quantity

The picking process can differ depending on whether the system is using the single or multiple pick prompt. In addition to this parameter, the quantity verification region parameter controls how the operator should respond to the prompted pick quantity.
When using the single prompt:

- If quantity verification is disabled, the operator responds with the product verification or location check digits to communicate that the entire prompted quantity was picked.
- If quantity verification is enabled, the operator responds with the product verification or location check digits. The operator is then prompted for the pick quantity. The operator responds with a quantity picked equal to the prompted pick quantity.

When using the multiple prompt:

- The operator is first prompted with the location. The operator responds with the product verification or location check digits to confirm the picking location.
- Next, the operator is prompted with the pick quantity. The operator responds as follows: If quantity verification is disabled, the operator responds with "Ready" to communicate that the entire prompted quantity was picked. If quantity verification is enabled, the operator responds with a quantity equal to the prompted pick quantity.

Pick Less Than the Quantity Requested (Short Pick)

The shorting process can differ depending on whether the system is using the single or multiple pick prompt. In addition to this parameter, the quantity verification parameter (which can be set for an option) controls how the operator should respond to the prompted pick quantity. When operators short a pick to zero, they may be required to provide a discrepancy code.
When using the single prompt:

- If quantity verification is disabled and the operator wants to report a short, the operator says "short product" at the point the voice system prompts the user for the location and pick quantity. The voice system then confirms that the item should be shorted and verifies the product verification or location check digits. On confirmation, the voice system prompts the operator to specify the quantity picked.
- If quantity verification is enabled and the operator wants to report a short, the operator responds with the product verification or location check digits and a quantity that is less than the prompted quantity. The voice system then confirms that the item should be shorted.

When using the multiple prompt:

- If quantity verification is disabled and the operator wants to report a short, the operator responds with "Short Product" when the voice system prompts the operator with the pick quantity. The voice system then confirms that the item should be shorted, and on confirmation, prompts for the shorted quantity.

- If quantity verification is enabled and the operator wants to report a short, the operator responds with a quantity that is less than the prompted quantity. The voice system then confirms that the item should be shorted.

When an assignment is completed, there may be items that were shorted. The WMS can create a new assignment that consists of items that were reported as shorts in other assignments. These assignments are referred to as chase assignments. Chase assignments can then be given to an operator in a directed or un-directed mode very similar to starting the assignment process all over.

Skip Picking an Item

When the operator is prompted with the quantity to pick, the operator can respond with "skip slot," if the configurations allow this command. The operator may also speak this command at the Slot prompt.
When an operator uses the skip location command, the voice system sends a message to the WMS indicating that the items in that location were picked, but the quantity picked for all items is 0, thereby shorting the entire quantity for that location. If configured to do so, the voice system may prompt the operator for a discrepancy code.
It is up to the WMS to determine which pick is sent after an operator skips an aisle or location. The WMS can also treat this like a true skip and allow the user to come back around to pick these items when they are finished with the current assignment with the hope that the location has sufficient inventory based on a replenishment or putaway.

Note: This can result in some confusion if the operator is trying to skip the final aisle or location; the WMS keeps sending them back to the same aisle or location even though they skipped it. The WMS can compensate for this by sending a message in the pick message field of the pick informing the operator that they are at the last aisle or location.

Cancel Picking an Item

Operators can cancel a pick when allowed by the configuration sent to the voice system. If operators are allowed to cancel a pick, they may be required to select a discrepancy code that indicates the reason for the cancellation. All picks at that location are canceled for the current assignment.
After an operator indicates a pick to be cancelled, the WMS determines the next pick for the operator.

Discrepancy Codes

The voice system prompts for a discrepancy code if the operator has

- canceled a pick
- skipped a location, or
- shorted a pick to zero.

If there is only one entry in the Lookup Values WMS response for the corresponding type, the operator is not prompted to enter a discrepancy code. The discrepancy code is transmitted back to the WMS in the Picked data message.
When an operator skips a location or cancels a pick, the discrepancy code is captured once and is applied to all pick records at the location.
After being prompted with a pick quantity, if the operator indicates that zero were picked, the short-to-zero discrepancy code is captured once and is applied to all pick records that made up that pick quantity.

Capture Data: What Data Do Operators Need to Capture for This Pick?

Description

The WMS determines the types of data values that must be captured by the voice operator and sends the data values to the voice device.

Capturing Data Elements

This function is designed generically so that the WMS can define what data elements should be captured for a particular pick. Some examples of data elements that can be captured include:

- **LPN** - Some warehouse store product in containers that are identified by a license (LPN). If configured to capture the LPN, the voice system prompts the operator to specify the LPN.
- **Lot numbers** - These are used to identify a manufacturing entity typically consisting of a production run against an item.
- **Revision Code** - This can control the revision number for the item if its produced/manufactured in different iterations
- **Origin Code** - This controls the country of origination for the part or inventory
- **Supplier Number** - In a supplier owned inventory model, this tracks the supplier that the inventory is owned by.

The system supports the ability to capture one or more of these elements for each pick line, as well as the ability to direct the operator to pick items with specific pieces of data. The WMS defines the actual prompt that tells the operator what data should be captured. Items are flagged to have data captured and whether operators should be directed to items with specific pieces of data in the Get Picks message.

Once prompted to provide this information, the operator specifies what the data value is and how much of the pick quantity has that value. The data can be spoken or scanned. If spoken, the data elements are repeated back to the operator for confirmation. The validation of the data is performed by the WMS through the Validate Inventory data message.
In cases where the operator specifies a data element for part of the pick quantity, the voice system continues processing the pick, going through each step up until the pick information is sent to the WMS for that partial quantity. When the voice system sends pick information to the WMS the

captured data elements are sent for each pick item.
At this point, the voice system loops back to the capture data step and prompts the operator to specify the data element for all or part of the remaining quantity. This enables the system to track exactly which picks have a specified data element when the pick quantity is split into multiple containers.

Capturing Variable Weights

Capturing variable weights is useful when picking items where the weight of one item varies from the weight of other items. This is common when picking meats, such as turkey or beef. To have the operator report the weight of individual pick items, a pick must be flagged as a variable weight item. Items are flagged as variable weight items in the Get Picks message and controlled within the WMS. When the operator is picking an item that is considered to be a variable-weight item, the voice system prompts the operator to specify the weight for each quantity of one. For example, if an operator is selecting a quantity of 5, the operator is prompted to report 5 weights. This prompt occurs after the operator confirms the quantity to pick and after any data is captured for the item.
Weights specified by the operator must be greater than zero. In addition, the length of the value specified for a weight must be seven digits or less, including a decimal point and the weight may only have up to two decimal places. Therefore, a value of 9999.99 is valid, whereas a value of 999.999 is not. The operator can respond to the variable weight prompt with the weight of the pick item or "Short Product".
For each reported weight, the voice system verifies that the weight is within the threshold specified for the item, which is provided by the WMS for each pick item. The weight must always be greater than zero. The voice system allows an operator to report weights outside of the tolerance range; however, the voice system ensures that the operator is aware of the discrepancy before continuing.
As the operator reports variable weights, the voice system stores all Picked messages until the last variable weight is reported. Subsequently, the Picked messages are sent back to the WMS for processing and further validation.

Capturing Serial Numbers

Serial numbers are unique identifiers for each individual pick item. The voice system supports the ability to capture the serial number for each individual pick item.
To have the operator report the serial number of individual pick items, a pick must be flagged to capture the serial number. Picks are flagged to capture serial numbers in the Get Picks message.
When the operator is picking an item that is flagged to capture the serial number, the voice system prompts the operator to specify the serial number for each quantity of one. For example, if an operator is selecting a quantity of 5, the operator is prompted to report 5 serial numbers.
If the Get Picks message indicates that it is allowed, and no other data is flagged to be captured, the operator may say "Range" to specify a starting and ending value for a range of serial numbers. The operator-specified serial numbers are sent to the WMS in the Picked data message.
The Get Picks message may also specify whether the WMS validates the serial numbers provided by the operator.
As the operator reports serial numbers, the voice system stores all Picked messages until the last serial number is reported. At this point, the Picked messages are sent to the WMS.

Performing a Cycle Count at a Location

This feature enables a warehouse to combine voice cycle counting at a specific location(s) with the picking process configured within the WMS. Operators performing picking may be prompted to perform a count at a particular location after the operator picks from that location in the form of a count back or count near zero. If configured to do so, the device prompts the operator to perform a count as one of the last steps in processing the pick, and this helps to validate the remaining inventory in the location. The terminal prompts the operator to confirm that the count equals the expected location count. The operator responds with "yes" or "no." No further action is taken if the count does not match the expected count and the WMS is notified to create an audit count of the location for another non-voice operator to complete.

Performing a Workflow Service

An operator may be directed to perform a workflow service after a pick or after a delivery. Workflows are configured within the WMS and provide different hook points that special messaging or actions can be initiated from within picking.

Performing a Workflow Service After an Item is Picked

After the Picked message is sent to the WMS, the voice system determines if workflow processes should be performed. A flag in the Get Picks WMS response is used to determine if the workflow to be performed should be requested from the WMS. If the flag indicates that workflow services should be performed, the voice device requests the Workflow message from the WMS. Each record returned includes the instruction with which the operator is prompted and how the operator should respond to the instruction.
For each instruction returned, the operator is required to respond as defined by the message and the response is transmitted back to the WMS in a new message. When the operator has been prompted with every instruction returned, the voice system returns to normal operation.

Performing a Workflow Service After a Delivery

After receiving a successful response from the Deliver transaction, the voice system determines if workflow processes should be performed. If there is an error code of "10" in the WMS response to the Deliver message, it indicates that workflow services should be performed. The voice system requests the Workflow message from the WMS. Each record returned includes the instruction with which the operator is prompted and how the operator should respond to the instruction.
For each instruction returned, the operator is required to respond as defined by the message and the response is transmitted back to the WMS in a new message. When the operator has been prompted with every instruction returned, the voice system then returns to normal operation.

Complete the Assignment and Sign Off

Description

Once a pick item is either fully picked or shorted, the voice system sends the pick information to the WMS in the Picked message. This message reports

- the quantity picked for that item.
- any data elements captured for that pick.
- the weight of each quantity of 1, if the item is a variable weight item.
- the serial number of each quantity of 1, if captured or a range of serial numbers for a quantity greater than 1.

Operators may be instructed to deliver an assignment when they are done picking, or they may speak "deliver now" (if configurations allow) at various points during the picking process to deliver what they have picked to that point.
In this step, the voice system

- retrieves the delivery location
- determines if the operator is required to deliver the assignment
- determines if the operator can specify a different delivery location
- determines if the operator can pick up another assignment, and
- if applicable, validates that the assignment was delivered to the correct location.

Determine if There are More Items to Pick in the Assignment

After the voice solution has processed all of the pick records it sends another Get Picks request to the WMS. If the WMS determines there are more items to pick, they are sent to the operator's device.
If there are no more items to be picked, the WMS returns:

- Error Code = 2: There are no more picks

OR

- Error Code = 3: There are no more picks and no quantity was picked, so the voice system bypasses any printing and delivery functionality at the end of the assignment.

After operators have picked all items, they may be directed to deliver the assignment.

Delivering the Assignment

When the assignment needs to be delivered, the voice system sends the Get Delivery Location message to retrieve the location where the assignment should be delivered. The voice system then determines if the operator should be prompted to deliver the assignment. If the Get Delivery Location message contains

- no LPN and an error code of 0, the operator is not prompted to deliver the assignment.
- an LPN, the operator is not prompted with a LPN and the delivery location.The operator is not prompted with an LPN if the Delivery Type = 4.
- a delivery type of 4 (an option setting), the WMS sends one record for each LPN that has all of the pick lines picked. This is useful for a pick and pass operation.

A Deliver message is sent to the WMS indicating that delivery is complete if the delivery field in the option configuration is set to 0, 1 or 3 and the operator has confirmed the location.
If the WMS returns an error code of 10 in the Deliver message, the voice system sends a Workflow message to the WMS to retrieve the processes to be performed. A message is then sent back to the WMS containing the results of the workflow process. When operators complete all workflow processes, they can return to the deliver step to see if there are more assignments to be delivered.
After delivery, the operator can also speak the "performance" command to obtain performance information for the last assignment and for the cumulative performance for the day.

Requesting to Pick Another

If allowed in the Delivery message, an operator may request to pick another assignment at the delivery prompt.
The "pick another" command is not allowed if the operator is

- delivering in the middle of picking an assignment,
- working on more than one assignment, or
- working within an option that allows the operator to pass assignments.

Note: The "pick another" command should only be used for picking single assignments. If multiple assignments are returned, unexpected behavior may result. Also, operators should not perform operations that can result in their changing options (regions); this can cause data problems and undelivered assignments.

When the operator finishes the additional assignment, the WMS returns the records for all of the assignments that were completed, including the last one.

Sign Off: Who is Signing off the Device?

Operators can sign off at nearly any point in the voice system if the system has been configured to allow it.
When an operator says "sign off", the voice system confirms that the operator wants to sign off.

- If the operator does not confirm the sign off command, the process continues from the point just before the operator spoke the command.
- If the operator confirms the sign off command, the voice system initiates the Sign Off message to notify the WMS that the operator is signing off. The operator is signed off if the WMS does not return an error.

Passing and Stopping Assignments

Description

During a voice picking assignment, an operator may have cause to either pass an assignment to another operator, or to stop the assignment altogether.

Passing Assignments

Operators can pass their unfinished assignments to other operators in regions configured for manual assignment issuance, except during the base picking pass. Assignments cannot be passed in regions configured for automatic assignment issuance because passed work assignments must be manually requested. Passed assignments are requested in the same manner as normal assignments in regions configured to allow operators to manually request assignments.
The operator says "Pass Assignment" to pass an assignment. This type of logic is typical in each picks to totes that then are placed onto conveyors. At the end of the picking zone for the user they may need to pass the totes onto the next zone for induction.
When an operator uses the Pass Assignment command when picking multiple assignments at the same time, the operator is prompted to deliver any assignments that have been fully picked. This causes completed assignments to be delivered, rather than being held up when grouped with one or more other assignments that are passed.
If operators are selecting in pick-by-pick mode and they pass an assignment, they may immediately be sent back for more picks without being informed that they are being sent for skipped picks. The WMS could compensate for this situation by adding a message in a pick message field informing operators that they are picking skipped picks if that is the case, or that the pass assignment command was not allowed.

Stopping an Assignment

When an operator stops an assignment, either by passing the remaining work to another operator or by completing it, the operator can perform another assignment, change the option, change the function, change the work area, or sign off.

Informational Commands

Description

An operator can request additional information from the voice device during a picking assignment. The device interacts with the operator, and based on which command is spoken, the device provides the operator with information to assist in completing the assignment.

Voice Commands
These commands assist the operator in gaining more information about the current assignment:

- **Help** - Used to ask the voice system how to respond to a particular prompt. When operators use this command, the voice system states what the typical response is and any additional commands that are valid at that prompt.
- **Say Again** - Directs the voice system to repeat what it said.
- **Description** - Used in different situations, as described in this table:

At This Prompt...	The Operator can speak "Descripiton" for the Device to Say...	And, in return, the operator can say...
Vehicle Type,	The vehicle type and description of the first valid vehicle type,	• "Ready," to listen to the vehicle type and description of the next valid vehicle type, until the voice system reaches the last valid vehicle type returned from the WMS. • "Stop," to exit this look before the last vehicle type is spoken.
Function,	The function number and description of the first valid function,	• "Ready," to listen to the function number and description of the next valid function, until the voice system reaches the last valid function returned from the WMS. • "Stop," to exit this loop before the last function is spoken.

Work Area,	The work area number and description of the first valid work area,	• "Ready," to listen to the work area number and description of the next valid work area, until the voice system reaches the last valid work area returned from the WMS. • "Stop," to exit this loop before the last work area is spoken.
Region (Option),	The option number and description of the first valid option,	• "Ready," to listen to the option number and description of the next valid option, until the voice system reaches the last valid region returned from the WMS. • "Stop," to exit this loop before the last option is spoken.
Break Type,	The break number and description of the first valid break type,	• "Ready" to listen to the break number and description of the next valid break type, until the voice system reaches the last valid break type returned from the WMS. • "Stop" to exit this loop before the last break type is spoken.
Asset Type,	The asset type number and description of the first valid asset type,	• "Ready" to listen to the asset type number and description of the next valid asset type, until the voice system reaches the last valid asset type returned from the WMS. • "Stop" to exit this loop before the last asset type is spoken.
Discrepancy Code,	The discrepancy code number and description of the first valid discrepancy code,	• "Ready" to listen to the discrepancy code number and description of the next valid discrepancy code, until the voice system reaches the last valid discrepancy code returned from the WMS. • "Stop" to exit this loop before the last asset type is spoken.
Printer,	The printer number and description of the first valid printer,	• "Ready" to listen to the printer number and description of the next valid printer, until the voice system reaches the last valid printer returned from the WMS. • "Stop" to exit this loop before the last printer is spoken.
When performing a warehouse function,	The description of the item currently being processed by the operator (that is, the item currently being picked, put away, and so on), if the description is available.	

- **No more** - This is only available when the operator is manually requesting ID(s) or when an operator is performing a function that enables the operator to request more than one region. In these situations, the operator can say, "No more," to inform the voice system that the operator does not want to specify any more IDs or regions.
- **Quantity** - Directs the voice system to say the quantity of the item that is currently being processed by the operator.
- **Item Number** - Directs the voice system to say the item number of the item that is currently being processed by the operator.
- **Location** - Directs the voice system to say the location of the item that is currently being processed by the operator.The voice system says the entire location including the pre-aisle direction, aisle, post-aisle direction, and location.
- **UPC** - Directs the voice system to say the UPC of the item that is currently being processed by the operator.
- **How Much More** - Retrieves how many items are left to pick in the current assignment from the WMS, then speaks this information to the operator.
- **Store Number** - Directs the voice system to say the store value that is returned in the Get Picks message, if available. If there are multiple values for store, the voice system responds that this information is not available.
- **Route Number** - Directs the voice system to say the route value from the Get Assignment message, if available. If there are multiple values for route, the voice system responds that this information is not available.

- **Reprint Labels** - Directs the voice system to resubmit the last Print message after asking the operator for the printer number so the last print job can be reprinted. The operator is prompted to confirm this operation.
- **Repeat Last Pick** - Directs the voice system to repeat the location of the previous pick, and how many the operator reported as picked.
- **Review Cluster** - Directs the voice system to repeat, for each ID the operator is working on, the ID and the position associated with that ID.
- **Review Last Item** - Directs the voice system to repeat the serial number and/or weight captured for the previous item.
- **Which Item** - When reporting variable weights, this command directs the voice system to say which item the operator is picking.
- **Undo Entry** - Directs the voice system to prompt the operator to say Last Entry, All Entries, or Continue. A pick item may be flagged to have the operator capture the serial number, the weight, or both. If the operator responds with "Last Entry," the voice system confirms the operator wants to re-enter the last serial number and/or weight. Upon confirmation, the voice system prompts the operator to report the weight again. If the operator responds with "All Entries," the voice system confirms the operator wants to re-enter all of the serial numbers and/or weights. Upon confirmation, the voice system prompts the operator to report each of the serial numbers and/or weights again. If the operator responds with "Continue," the voice system continues with the picking process flow.
- **Performance** - Directs the voice system to say the performance of the last assignment compared to the operator's standard performance. This information is only available at the assignment summary prompt.

Additional Voice Operations

Description

The voice solution lets operators change workflows or take breaks by speaking commands. Upon receiving one of these commands, the voice device communicates with the system to process the operator's request.

Speaking Messages to Operators

This feature lets the device speak messages to an operator as part of the pick prompt. The messages are related to individual picks and are passed to the voice system as part of the pick data. The messages are not created in real time but are sent by the WMS to the device.
When an operator is picking a chase assignment, pick messages are only spoken when the pick message provided is the same for all the picks to be picked at a location.

For example,
Device: "Pick 10. Pull units from top shelf first."
Operator: "Ready."

In addition, when an operator is picking multiple assignments at the same time, pick messages are only spoken when the pick message provided is the same for all the picks to be picked at a location.

Taking Breaks

At certain prompts in the process flow, an operator can indicate that a break is needed. This feature captures the starting and ending times for breaks, which can be used in labor tracking data within the RedPrairie Workforce Management system.
When an operator says "take a break", the device prompts for a break type. At least one break type must be sent to the voice system to allow operators to take breaks. Break types are sent to the voice system during the sign on process flow using the Break Types data message.
The operator must respond with a valid break type before the break is granted. Once a valid break type is specified, the voice system sends the Break Request data message to the WMS, which tells the WMS that the operator is starting a break, when the break began and what type of break is being taken. These are handled as indirect activities within the WMS.
The operator's password must be spoken upon returning from a break. After the password is confirmed, the voice system sends the Break Request data message to the WMS, which is used in this instance to tell the WMS that the operator is returning from a break and when the break ended.

Changing Functions

The Change Function command lets an operator change which function is being performed.
When an operator says "change function", the voice system initiates the specify function process flow. After an operator changes the function, the voice system moves on to the specify option process flow, and then to the process flow for the newly specified function.

Changing Work Areas

The Change Work Area command changes the work area in which an operator is working.
When an operator says "change work area", the voice system initiates the specify work area process flow. After an operator changes the work area in which pick work is, the voice system moves on to the specify option process flow.

Changing Options

The Change Option command changes the option with which an operator is working.
When an operator says "change option", the voice system initiates the specify option process flow.
After changing the option with which the operator is working with, the voice system continues with the process flow for the function that the operators were currently performing.

Voice Supported Picking

Description

The WMS sends one or more picks at a time at the beginning of an assignment, giving the WMS the ability to direct and respond to operators based on information received from previous picks and from other operators working at the same time.
Voice is able to support multiple types of picking, which can differ depending on the warehouse, the operators or a specific assignment.

Directed Picking

This type of pick work involves the system assigning the operator work from the work queue, and then directing the operator to each location where items need to be picked and/or deposited. Directed work can include individual picks, list picking and cluster picking.

Undirected Picking

This type of pick work involves the operator entering or speaking a work ID at sign on. Undirected pick work is generally used for single case or each picking. An operator can speak any standard, full-value pick identifier normally entered on an RF undirected screen to begin work. If your system recognizes universal commercial codes (UCCs), a partial work identifier spoken is translated by the system as a UCC. If your system does not recognize UCCs, then a partially spoken identifier is translated as a work reference number.

List Picking

This type of pick work involves the operator following a system-created list of picks to fulfill orders in the work queue. When voice picking, operators can speak a list ID, a label batch or a shipment ID to begin work. If a partial identifier is spoken, the system only recognizes it as a list ID. List picks can include groups of single picks or carton picks.

Cluster Picking

This type of pick work allows operators to pick and pack product to cartons for multiple orders during a single pass through a pick location. If two cartons have identical items to be picked from the same location, the operator navigates through picking prompts for one carton until it is complete. Upon confirmation of completion, the operator is then directed to do the same for the second carton while still at the same location.

Bulk Cluster Picking

This type of pick work is similar to cluster picking, but gives the operator an alternative workflow. If two cartons contain identical picks from the same location, bulk cluster picking enables the system to join the picks and present them to the operator as one assignment. Since the picks are completed at the same time, after completing the picks for both cartons, the operator is then directed to split the picks as needed between the respective cartons.

Conveyor Cluster Picking

This type of pick work similar to bulk cluster picking with the addition that the operator can deposit completed cartons on a conveyor. Operators also have the option to manually pick and pass; that is, an operator can elect to pass the pick work to another operator at any time. Normally, with automatic pick and pass, the system passes picks to another operator when the first operator has completed all picks in a given work zone.

Load Transfer

This type of work involves an operator transferring product from one location to another within the warehouse. An operator must speak a full-value load number and, based on work queue data, the system then directs the operator to deposit the load at the transfer location.