

The Power of Voice

The Value Proposition of Voice-directed Warehousing

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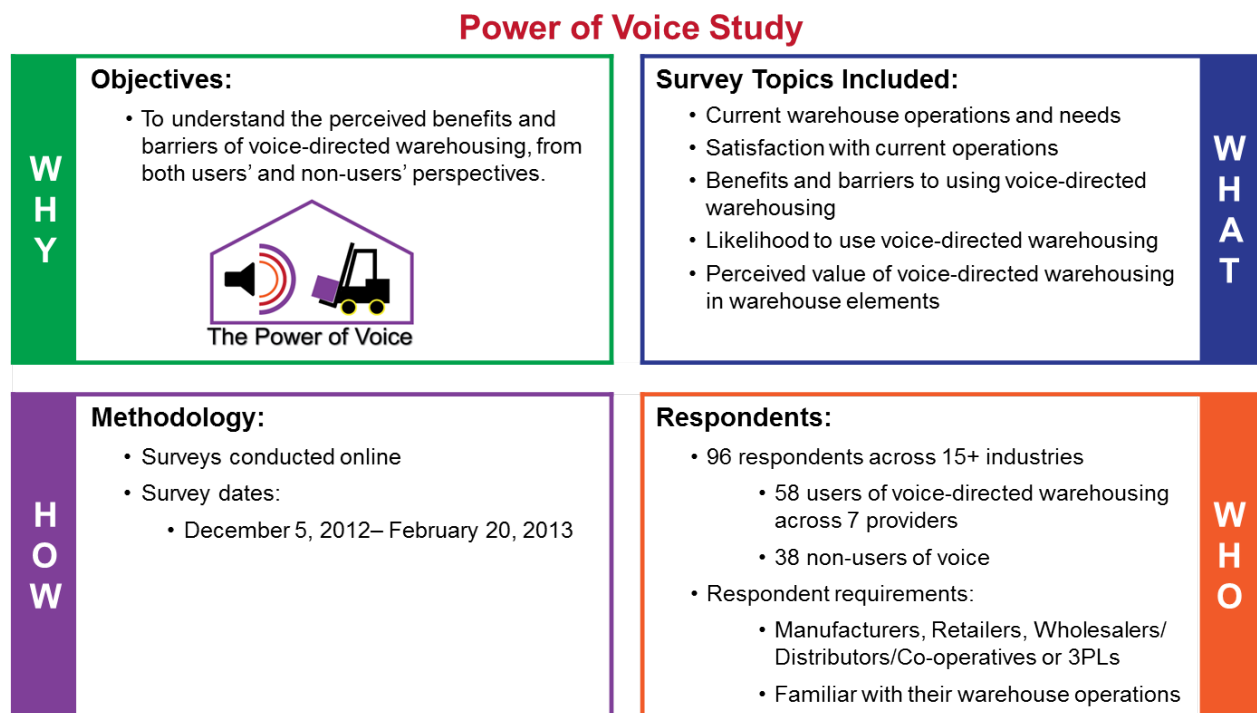
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Research

This report is based on a quantitative research study conducted during December, 2012 through February, 2013 to understand the value proposition of voice-directed warehousing. The study was placed into the field by Supply Chain Insights through social media connections, such as LinkedIn and Twitter, with the aim of reaching both users and non-users of voice-directed warehousing. We were assisted with data collection by emails sent to voice-directed warehouse software users by technology providers. A synopsis of the quantitative survey methodology is shown below. The detailed demographics are shared in the Appendix in figures A-E. This report is augmented with data from the Supply Chain Insights *Voice of the Supply Chain Leader* studies, conducted in 2012, on overall satisfaction with supply chain applications.

Figure 1. Overview of the Voice-directed Warehouse Study



Source: Supply Chain Insights LLC, Power of Voice (Dec 2012-Feb 2013)

Disclosure

As an independent analyst firm, your trust is important to us. In conducting research, we are open and transparent about our financial relationships and our research processes.

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Executive Overview

A warehouse is not a warehouse and a supply chain is not a supply chain. They come in various sizes, varieties and with different requirements. They vary by industry and product requirements. It is hard to generalize. They need to be designed and fit for purpose, but there is no question that they are growing more complex. As complexity increases, manufacturers and distributors are seeking new ways to optimize customer service requirements with rising labor costs.

One of these options is voice-directed warehousing. Voice-directed warehousing—where a warehouse worker is directed to perform tasks based on voice automation using a headset—is now over twenty years old. It enables a worker to process orders “hands-free and eyes-free” improving safety, quality and productivity. The processes are maturing and the technologies are increasing in capability. We have moved from early adopter, or early experimentation with the technology, to main market adoption where mainstream manufacturers and distributors are trying to rationalize the value proposition. This report is designed to answer the question, “*What is the value of voice?*” for the supply chain leader. The top reason that supply chain leaders use the technology is to improve the quality of loads to the customer. Here we tell this story.

Today’s warehouses are more complex than ten years ago. Products and channels have proliferated, late-stage customization requirements have increased, the number of temperature environments has multiplied (e.g., cold chain, frozen etc.), and warehouse employee turnover is greater than ever before. Customer service requirements have increased and as a result, a greater percentage of products are picked by either the “each,” the “case,” or the “layer” in the modern warehouse.

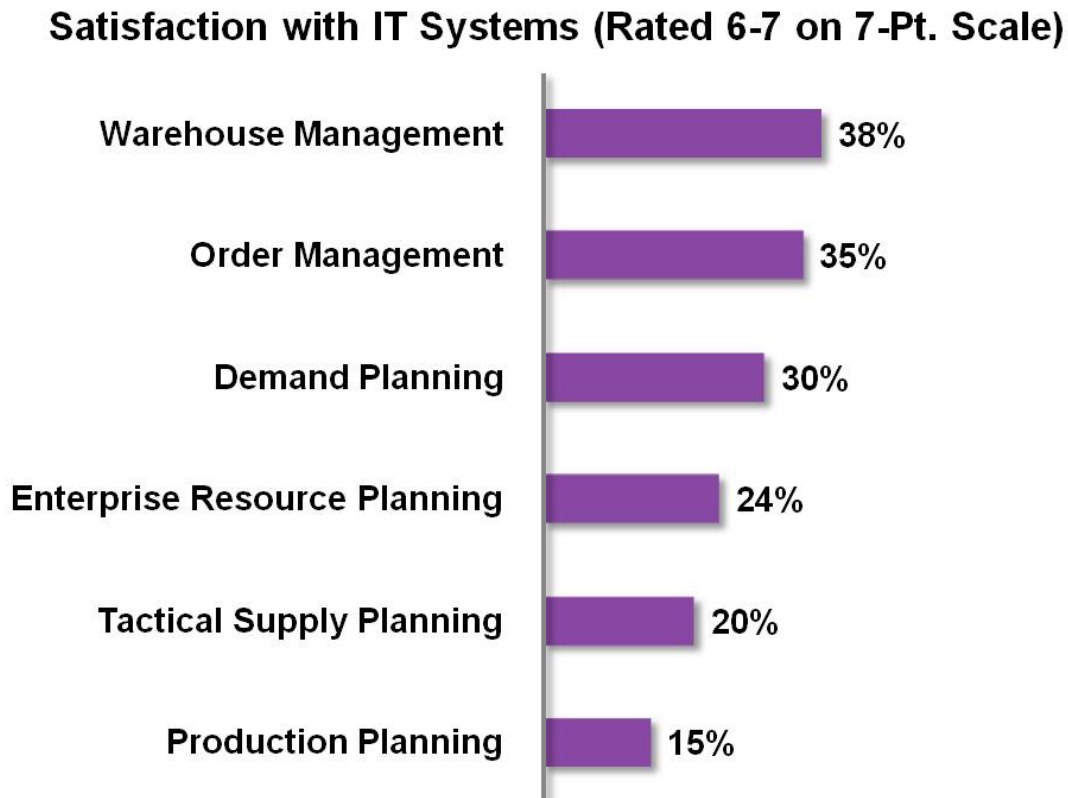
Today, there are higher demands for customer service in the organization. The cadence of customer requests and new requirements increases each year. Accurate transmission of these requests into action is problematic. The environment has grown more dynamic. Order cycle time is shrinking. There is continuous pressure to reduce costs and improve customer service. Demand volatility reigns. Product variants and master data issues abound. Voice-directed warehousing offers promise, but how do companies rationalize the capital costs?

Additionally, compliance regulations loom. How will the warehouse adapt to product serialization in pharmaceutical companies? What will *field to fork* legislation mean for food and beverage manufacturers? How will product tracking and customization for [REACH](#) impact flows? There are more questions than answers. The only thing that is known is the warehouse will be rife with change.

In this study of 96 respondents from over 80 companies, the average use of voice-directed warehousing was five years among users. There were 58 respondents using voice-directed warehousing and 38 that were not. Among users of voice-directed warehousing, only 17% used voice alone. Instead it was usually used in concert with barcode scanning.

In general, companies are happier with supply chain execution technologies (warehouse management and transportation management) than supply chain planning. The software application environment is dissimilar and diverse. Based on a prior study of supply chain leaders by Supply Chain Insights, the average company has a heterogeneous IT environment with many systems, and 33% of respondents have three or more warehouse management solutions¹. As seen in figure 2, this prior study shows that warehouse management applications have the highest user satisfaction rates.

Figure 2. Line-of-business Leader Satisfaction Rates with Supply Chain Applications (from Prior Study)



Source: SupplyChain Insights, LLC, Voice (April 2012)

Base: Supply Chain Executives – Have 1+ Operational IT Systems (varies by system) (n=48/60/57/59/49/55)

Q17. How satisfied are you with each of your current IT systems shown below?

SCALE: 7=Extremely satisfied – 1=Extremely dissatisfied

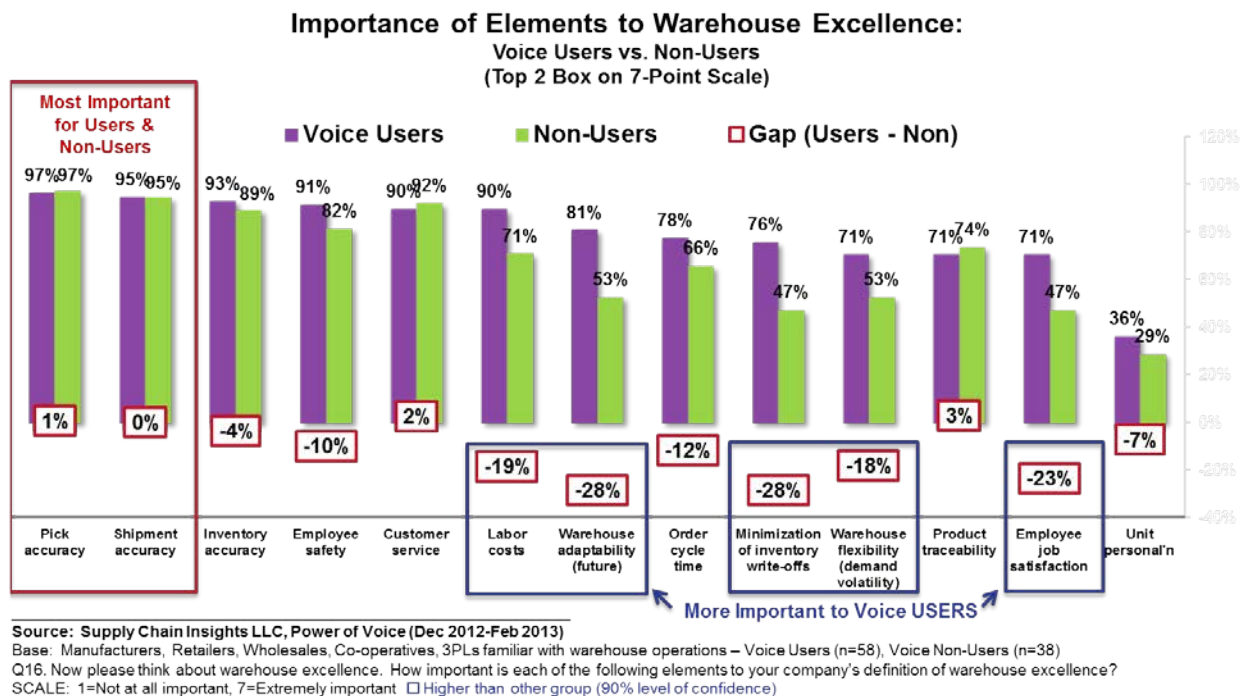
Fulfilling an order today is more complex than two years ago. Based on ever-changing product requirements, the increase in expectations for unit-level picking, and warehouse employee turnover, warehouse operations are struggling. As we see in the data in figure 3, voice-directed warehousing improves user satisfaction with warehousing systems. While we cannot directly compare the two studies to get an absolute improvement rate, we know from prior research that user satisfaction with Warehouse Management Systems (WMS) is the highest among supply chain applications, and satisfaction among voice-directed warehousing users is higher than among non-users.

Figure 3. Satisfaction with Warehouse Operations (User & Non-users of Voice-directed Warehouse Operations)



The greatest opportunities, as shown in figure 4, are for companies that want to reduce warehouse costs and improve flexibility and/or job satisfaction of warehouse employees. All users of warehouse management want to improve loading accuracy. Voice improves the quality of loads. There is a strong pattern between the use of voice-directed warehousing and large quantities of picked cases.

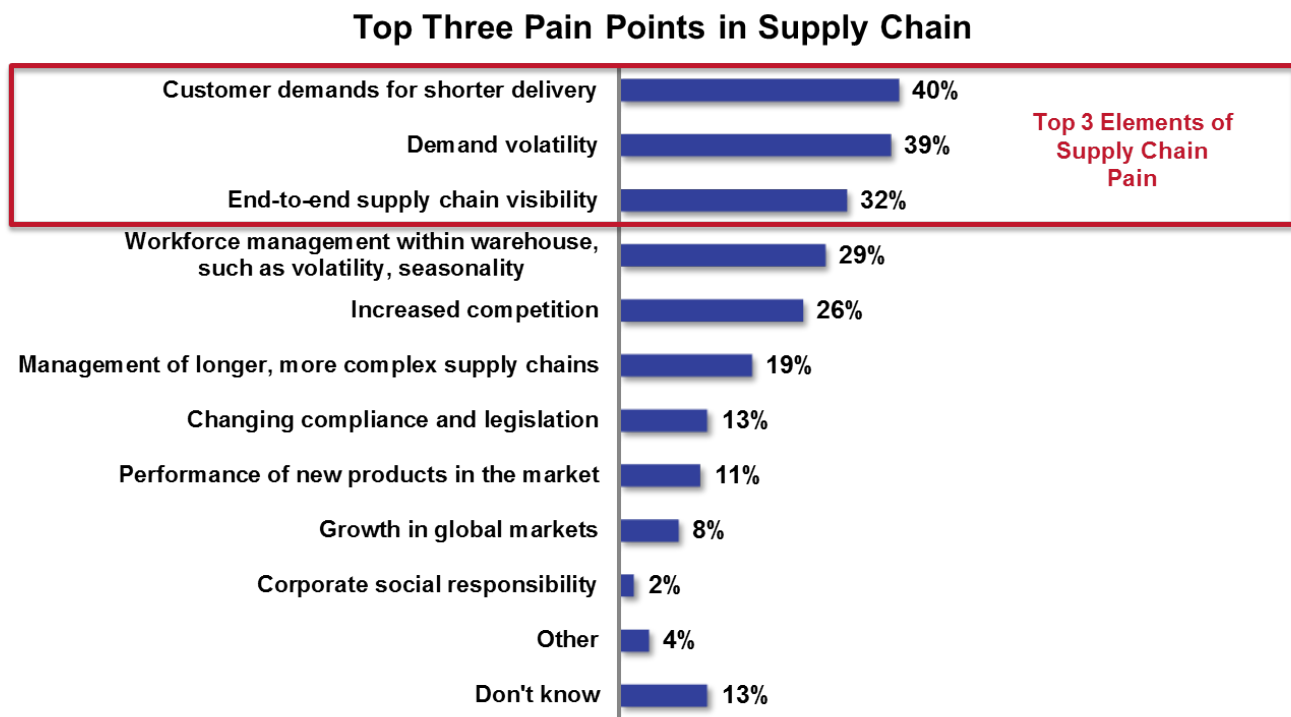
Figure 4. Importance of Different Elements of Warehouse Excellence to Voice User and Non-user Clients



Today's Warehouse Operations

For the supply chain leader in distribution, the drumbeat of customer demands and increased demand volatility drives day-to-day decisions. As shown in figure 5, this supply chain leader struggles, caught between the increased cadence of channel requirements and the limited visibility of supply. Year after year, the pace of change increases and the focus to do more with less tightens like a Gordian knot around the warehouse manager. Voice-directed warehousing is the most accepted in warehouses that are pressured for a shorter delivery and want to improve the quality of the loads delivered to the customer.

Figure 5. Top Three Pain Points in the Supply Chain



Source: Supply Chain Insights LLC, Power of Voice (Dec 2012-Feb 2013)

Base: Manufacturers, Retailers, Wholesales, Co-operatives, 3PLs familiar with warehouse operations – Total (n=96)

Q27. What are your company's top three pain points in the supply chain, at this point in time?

Based on the current research, the average company has 10-11 warehouses. There is also a growing and strong dependence on third-party logistics (3PL) relationships. Few operate with a common system. Instead, warehousing leaders need systems that operate within a heterogeneous environment. Within the warehouse, the investments have been many, and the techniques to improve picking and warehouse operations have spanned the last two decades. As shown in figure 6, users of voice-directed warehousing applications are more likely than non-users to use advanced automation for storage and retrieval, and to have actively worked on the implementation of Radio-Frequency Identification (RFID) technologies. Among voice-directed warehousing users, 100% use it for picking, 17% use it for replenishment and 14% use it to automate the put-away of goods (for details see Appendix figure E).

The non-user of voice-directed warehousing, on the other hand, is more likely to rely on paper-based solutions and manual labels. *Pick to light* usage was low in this study for both groups.

Figure 6. Comparison of Warehouse Automation Techniques for Voice-directed Users and Non-users

Warehouse Operations: Cross-Usage

Top 3 Operations	Total	Voice User	Non-User	Paper-Based User	Barcode Scan User
Base:	96	58	38	48	69
Barcode Scanning	72%	74%	68%	71%	100%
Voice-Directed Warehousing	60%	100%	-	44%	62%
Paper-Based Systems	50%	36%	71%	100%	49%
Advanced Automation	29%	41%	11%	25%	39%
Non-Barcode Labels/Stickers	27%	24%	32%	35%	29%
RFID (Radio Frequency Identification)	14%	19%	5%	17%	17%
Pick to Light	9%	10%	8%	10%	12%
Robotics	8%	9%	8%	6%	10%
Other	2%	3%	-	2%	1%

Source: Supply Chain Insights LLC, Power of Voice (Dec 2012-Feb 2013)

Base: Manufacturers, Retailers, Wholesales, Co-operatives, 3PLs familiar with warehouse operations (n=96)

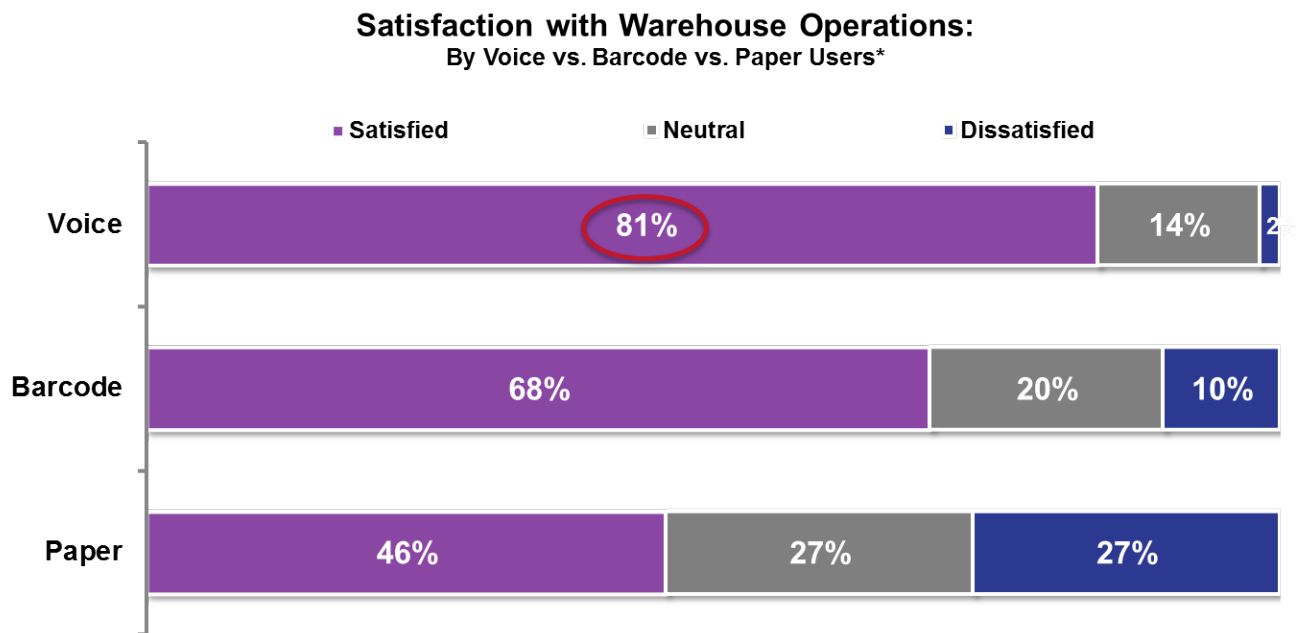
Q4. For the rest of this survey, please think about your company's warehouses in the region where you work. Which types of operations currently exist in these warehouses? Please select all that apply. ● = Higher than other group (90% level of confidence): Voice vs. Non; Paper vs. Barcode

NOTE: This table should be interpreted only in terms of who this study reached and relative differences between groups – not as a measure of system reach overall.

Satisfaction of voice-directed users is high with current systems. Of the users of voice-directed warehousing, 84% were satisfied with the results. Only 7% were dissatisfied. The primary reasons for satisfaction were the improvements in quality (directed actions with employee confirmations) and the improvements in labor efficiency while improving customer service levels.

A detailed level of overall warehouse satisfaction is shown in figure 7. Users of voice-directed warehousing overall were more satisfied than non-users with their warehouse operations.

Figure 7. Relative Satisfaction with Warehouse Operations



Source: Supply Chain Insights LLC, Power of Voice (Dec 2012-Feb 2013)

Base: Manufacturers, Retailers, Wholesales, Co-operatives, 3PLs familiar with warehouse operations – Voice Users (n=58), Barcode (n=69), Paper (n=48)

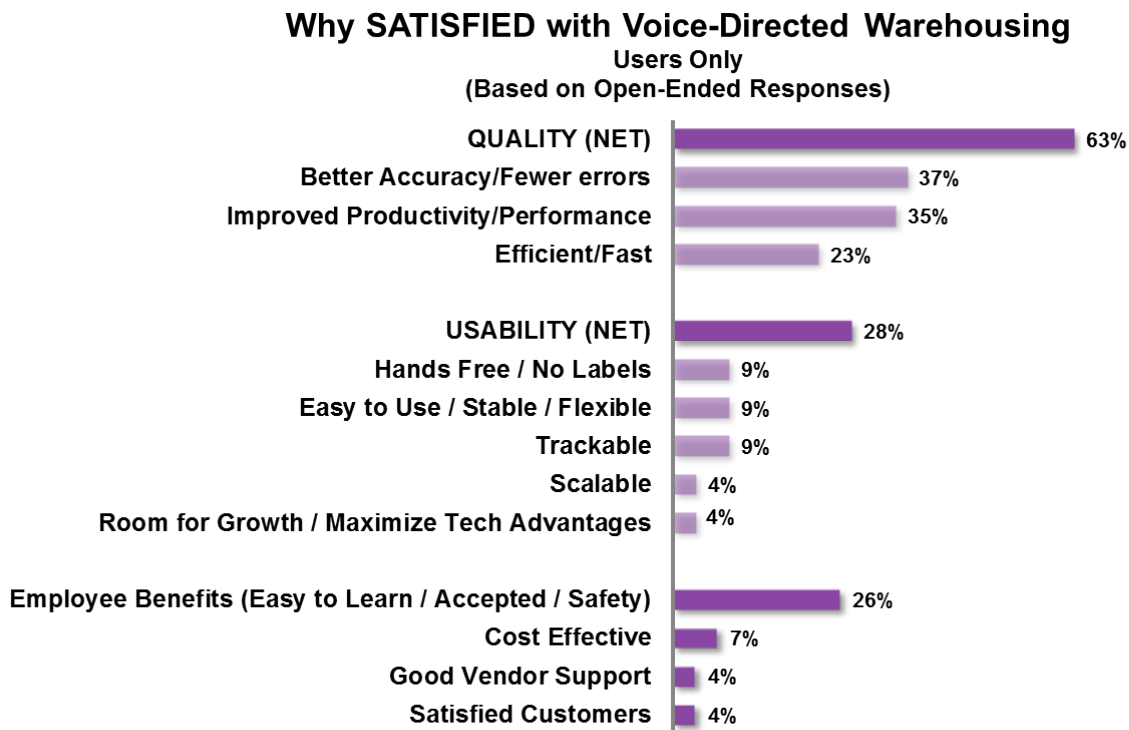
Q5. Thinking of the different warehouse operations you just selected, how satisfied is your company with its current warehouse set-up overall?

Please consider all warehouses in your region. SCALE: 1=Extremely dissatisfied, 7=Extremely satisfied

*NOTE: Only showing those with a sample size of n=30+; There is overlap between groups since respondents can have more than one operation

● = Higher than other groups (90% level of confidence)

Figure 8: Reasons Satisfied with Using Voice-directed Warehousing



Source: Supply Chain Insights LLC, Power of Voice (Dec 2012-Feb 2013)

Base: Manufacturers, Retailers, Wholesales, Co-operatives, 3PLs familiar with warehouse operations – Voice Users (n=57)

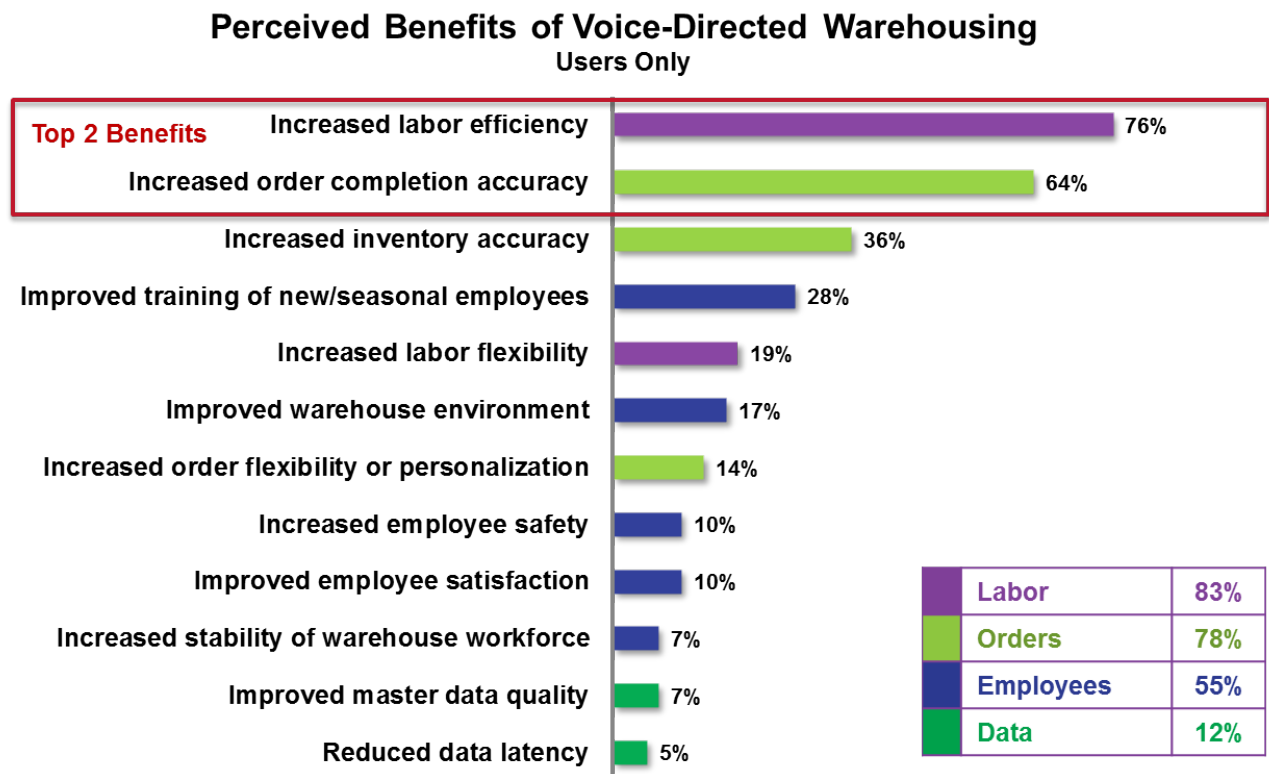
Q14. Why is your company [satisfied][not that satisfied] with its use of voice-directed warehousing? TEXT RESPONSE

Why it Matters

The goal of this report is to help companies figure out the relative importance of the investment in voice-directed warehousing versus other projects. One of the issues with a project is that the value proposition varies by the type of warehouse, product handling requirements and the nature of the workforce. As shown in figure 8, the benefits can be grouped by labor efficiency, quality (order accuracy and order fulfillment) and improved working environments. Employee safety, the management of seasonal labor, and the improved quality of life for the warehouse worker can often not be quantified in hardcore numbers, but are clear from the results of the study.

In aggregate, as shown in figure 9, the primary value proposition of voice-directed warehousing is improved labor efficiency; but the secondary proposition, and an important consideration, is the improvement in order completion accuracy. In short, the value proposition hits two primary objectives of the supply chain leader: cost and improved quality in picking, which improves customer service.

Figure 9. Perceived Benefits of Voice-Directed Warehousing among Users



Source: Supply Chain Insights LLC, Power of Voice (Dec 2012-Feb 2013)

Base: Manufacturers, Retailers, Wholesales, Co-operatives, 3PLs familiar with warehouse operations – Voice Users (n=58)

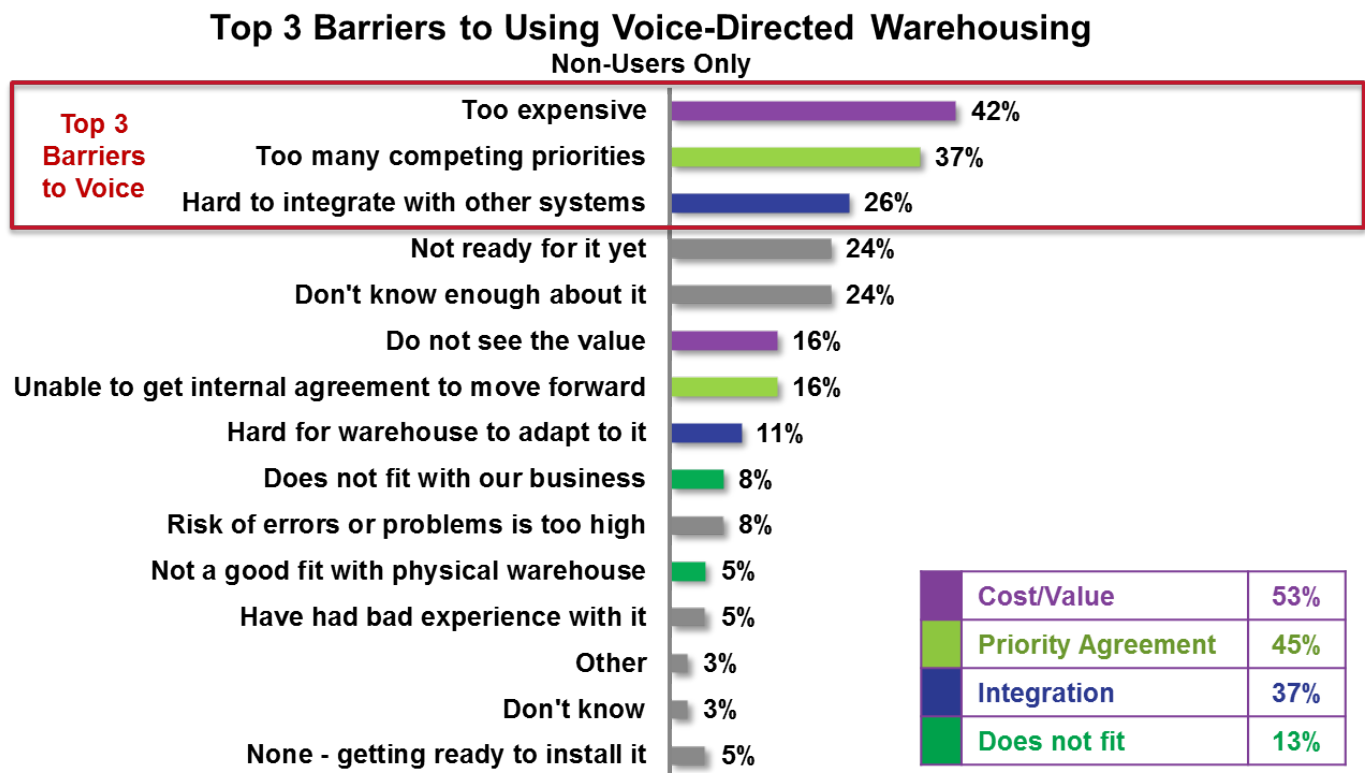
Q8. Which of the following are the top 3 benefits of using voice-directed warehousing for your company? Please select the top three.

Barriers

The two primary barriers to adoption of voice-directed warehousing are the cost and the conflict with other priorities within the organization. Today's organization is busy with many projects, and the question becomes the relative importance of voice-directed warehouse operations. Many companies struggle to get funding and internal resources to drive the quality and labor advantages made possible through the implementation of voice-directed warehouse operations.

The technological capabilities of voice are rapidly changing, improving the chances of success with a voice implementation. While voice and mobile technologies may not have been a good fit for a warehouse environment in the past, as shown in figure 10, the hardware risks associated with a voice-directed warehouse implementation have declined. It is just hard for many teams to build a justification amongst a myriad of other projects.

Figure 10. Barriers to the Implementation of Voice-directed Warehousing



Source: Supply Chain Insights LLC, Power of Voice (Dec 2012-Feb 2013)

Base: Manufacturers, Retailers, Wholesales, Co-operatives, 3PLs familiar with warehouse operations – Voice Non-Users (n=38)

Q10. What are your company's top 3 barriers to using voice-directed warehousing? Please select the top three.

Summary

Today, warehouse management and order-to-cash processes are mature. They are being challenged by increased customer expectations for quicker delivery, specialized services on fulfillment and exploding product complexity. It is clear from this study that voice-directed warehousing greatly improves order cycle speed and fulfillment accuracy. As a result, the satisfaction with warehouse management technologies for voice-directed users is 2-3X that of non-voice users (depending on the industry). (Footnote: In this study, 81% of voice-directed users were satisfied with warehouse systems while 34% of non-voice users were satisfied.) As a result, for supply chain leaders, the use of this technology is growing in importance.

It is a story of successful technology evolution. At the start of the decade, voice-directed warehousing was a disruptive technology. The early adopters faced greater risk on the use of the technology and the modification of processes to best use the technologies. Today, this is no longer true. The risk of implementation has dissipated—the technologies are more mature and the processes more refined—improving the time to value. Today, voice-directed warehousing is a compelling investment.

Definitions

Voice-Directed Warehousing: A computer-based voice system utilizing audible instructions and recognizes the worker's spoken responses to manage item handling within the distribution center.

Appendix

Demographics

The data from this report primarily came from an online, quantitative survey fielded by Supply Chain Insights during the period of December, 2012 through February, 2013. The respondents answered the surveys of their own free will. The only offer made to stimulate a response was to share the survey results in the form of Open Content research at the end of the study.

The names of those that completed the surveys are held in confidence, but the demographics are shared to help the readers of this report gain perspective on the respondents. The demographics supporting these figures are found below in Figures A-E.

Figure A. Role and Company Demographics of the Respondents

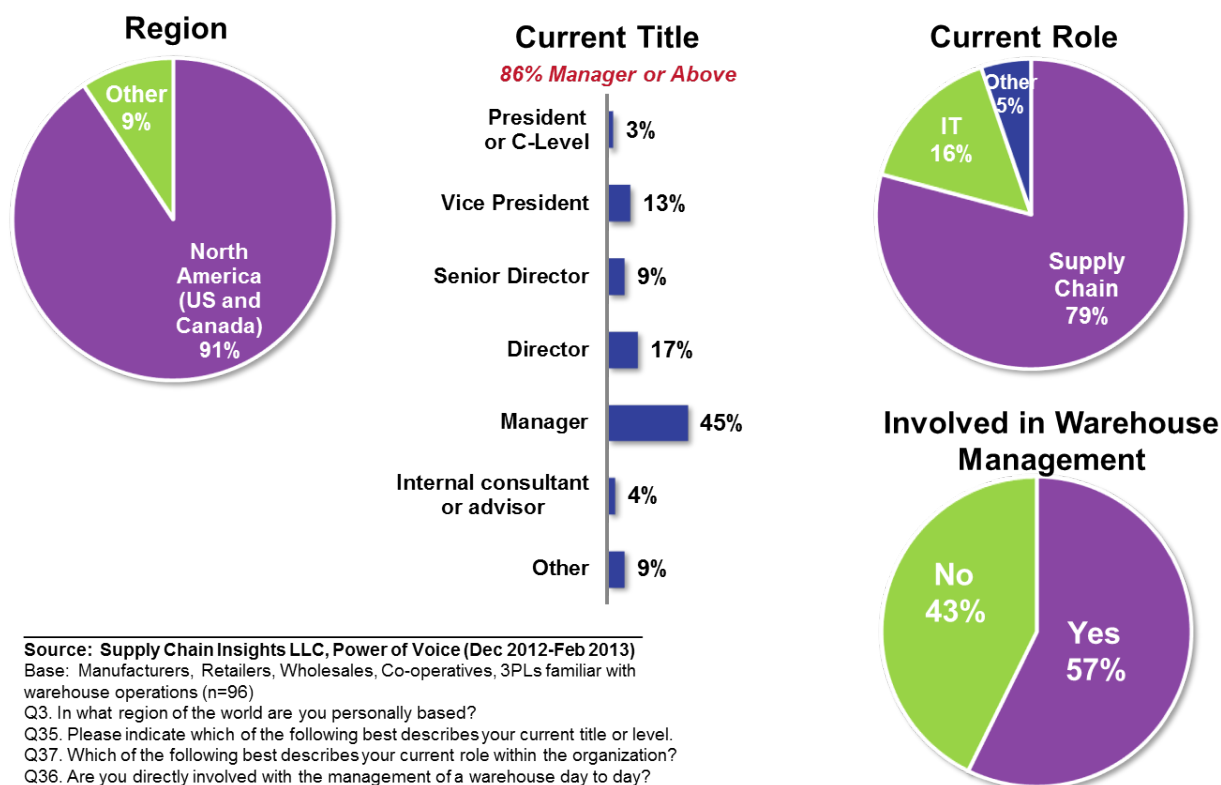


Figure B. Industry Demographics of Respondents

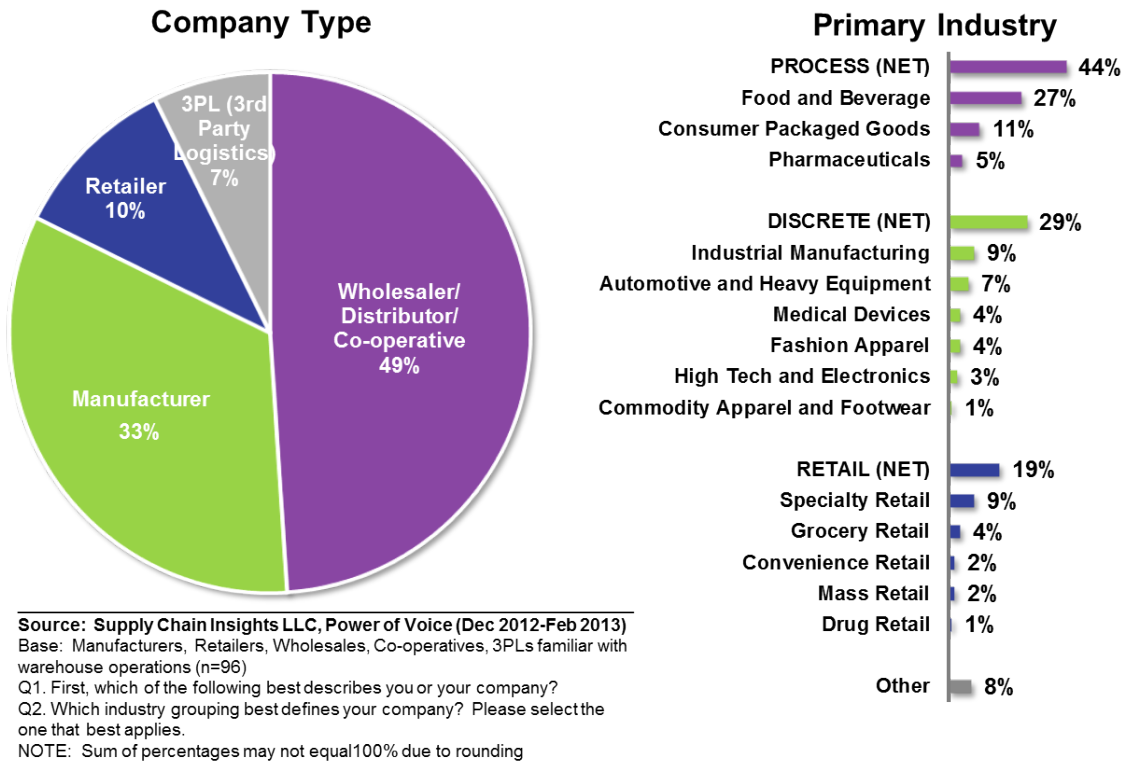


Figure C. Company Size

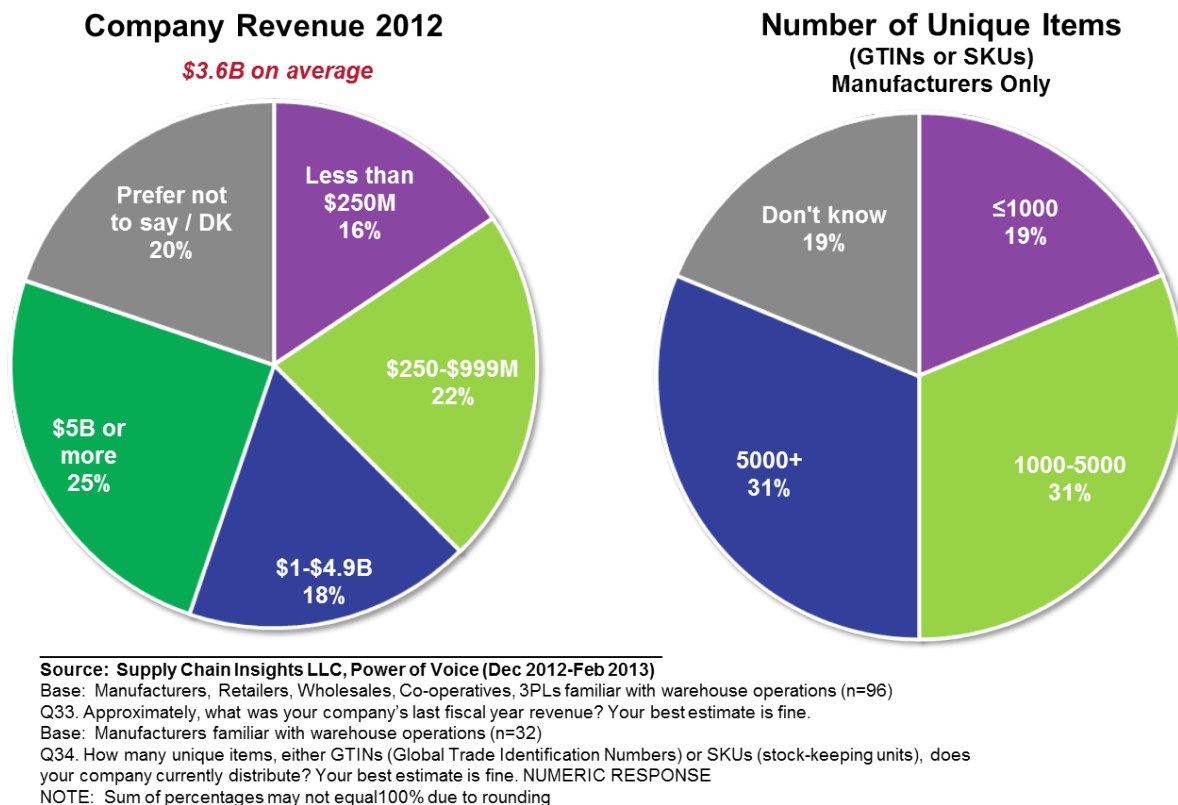


Figure D. Respondent Familiarity with Voice-directed Warehousing

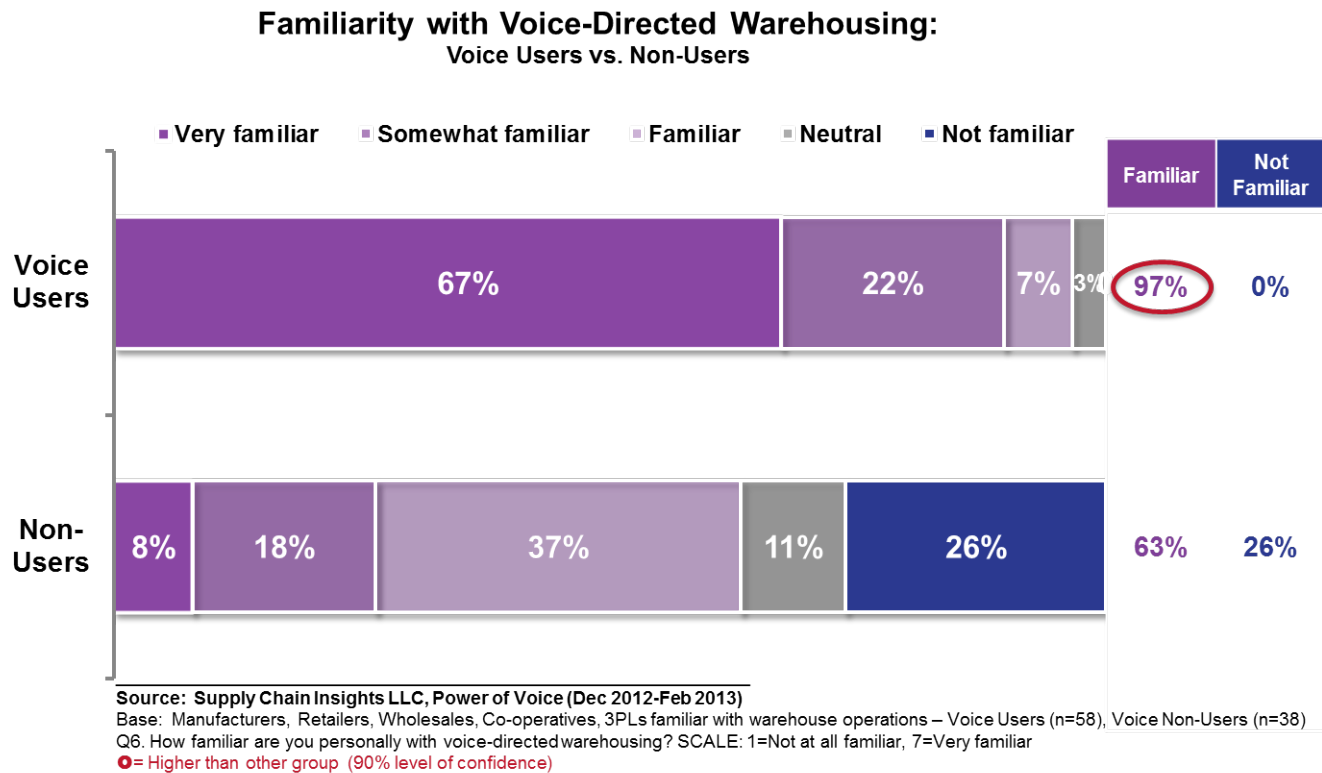
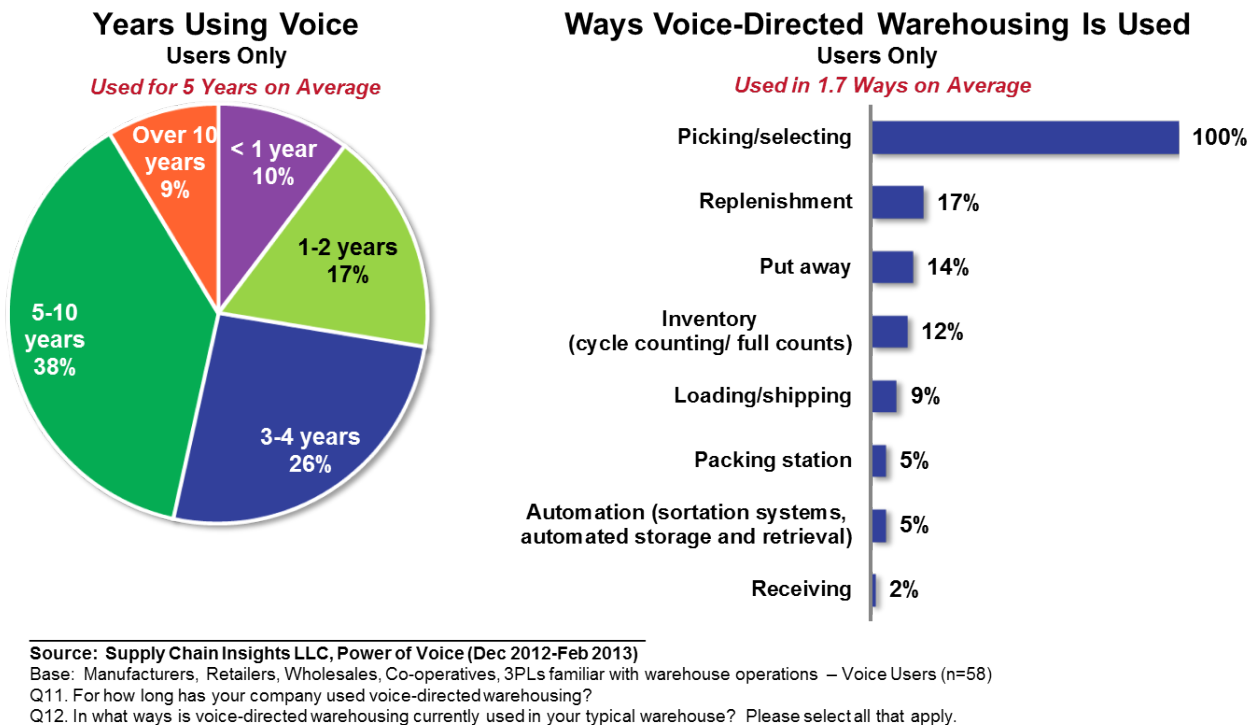


Figure E: Use of Voice



An additional report related to this subject:

[Voice of the Supply Chain: Leaders Speak on Technology](#)

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About Supply Chain Insights LLC

Supply Chain Insights LLC is a research and advisory firm intent on reinventing the analyst model. The services of the company are designed to help supply chain teams improve value-based outcomes through research-based Advisory Services, a dedicated Supply Chain Community and public/in-house training. Supply Chain Insights is focused on delivering **independent, actionable and objective advice for supply chain leaders**. A company dedicated to research, turn to us when you want the latest insights on supply chain trends, technologies to know and metrics that matter.

About Lora Cecere



Lora Cecere (twitter ID [@lcecere](#)) is the Founder of [Supply Chain Insights LLC](#) and the author of popular enterprise software blog [Supply Chain Shaman](#) currently read by 5,000 supply chain professionals. Her book, ***Bricks Matter***, (co-authored with Charlie Chase) published on December 26th, 2012.

With over nine years as a research analyst with **AMR Research, Altimeter Group, and Gartner Group**, and now as a Founder of Supply Chain Insights, Lora understands supply chain. She has worked with over 600 companies on their supply chain strategy and speaks at over 50 conferences a year on the evolution of supply chain processes and technologies. Her research is designed for the early adopter seeking first mover advantage.

ⁱ Voice of the Supply Chain Leader, Supply Chain Insights, Publications June 2012 and December 2012