

WORST PRACTICES IN AUTOMOTIVE SPEECH INTERFACES

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“...Usability issues associated with in-vehicle technology increasingly influences vehicle owners' perception of vehicle dependability...”

<http://autos.jdpower.com/content/blog-post/xCztqM4/in-vehicle-technology-significantly-impacts-owner-satisfaction-according-to-j-d-power-2015-vehicle-dependability-study.htm>



“...Bluetooth connectivity and built-in voice-recognition systems are the two most frequently reported problems.”

<http://autos.jdpower.com/content/blog-post/xCztqM4/in-vehicle-technology-significantly-impacts-owner-satisfaction-according-to-j-d-power-2015-vehicle-dependability-study.htm>

Why speech in the car?



Nexus 5
5"



iPhone 6
4.7"





“In 2013, 3,154 people were killed [and approximately 424,000 people were injured] in motor vehicle crashes involving **distracted drivers.**”

<http://www.distraction.gov/stats-research-laws/facts-and-statistics.html>





“**Distraction** was a factor in nearly 6 out of 10 moderate-to-severe **teen** crashes, which is four times as many as official estimates based on police reports.”

<http://newsroom.aaa.com/2015/03/distraction-teen-crashes-even-worse-thought/>





Imperfect Hands-Free Systems Causing Potentially-Unsafe Driver Distractions

<http://newsroom.aaa.com/2014/10/imperfect-hands-free-systems-causing-potentially-unsafe-driver-distractions/>

“Two new AAA-University of Utah studies show that despite public belief to the contrary, hands-free, voice-controlled automobile infotainment systems can **distract** drivers, although it is possible to design them to be safer...”

“The research revealed that the more distracting voice-based systems were that way because they were too **complex**, mentally demanding, **difficult to use** and often **inaccurate** at recognizing voice commands.”



Don't Dismiss Voice Recognition in Cars

BY DOUG NEWCOMB AUGUST 15, 2014 2 COMMENTS

While voice recognition can be frustratingly inconsistent, when it works it's great to be heard.

39    
SHARES





IHS **Technology**

Information. Analytics. Expertise.

“55 percent of all new motor vehicle vehicles produced in 2019 will incorporate voice recognition, up from 37 percent in 2012.”



“...Within the past year alone, there has been an 11% increase in the proportion of consumers who say that the **lack of the latest technology features** is one of the most important reasons why they avoided a specific model or brand.”

Contradictions?



Survey: Speech technologies in the car

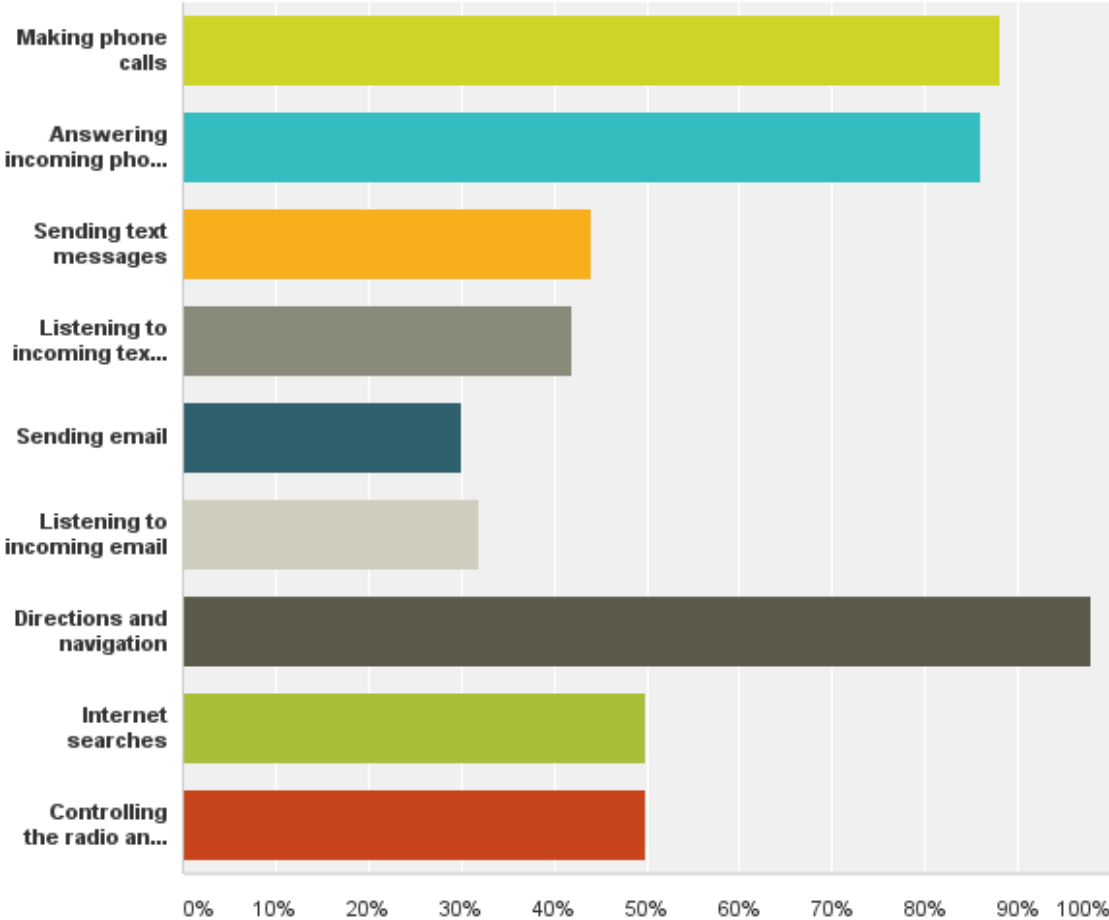
1. Which specific technologies?
2. For what purposes?
3. How often?
4. Motivation for using speech?
5. What do people think of it?

Survey Participants

- 50 participants, age 18+
- Qualifying criteria:
 - Must have a valid driver's license
 - Own a smart phone
 - Use some kind of speech technology in the car at least 3 times per week

Q2 I use speech recognition in my car for.....(choose all that apply, or explain if the reason you use it isn't listed)

Answered: 50 Skipped: 2



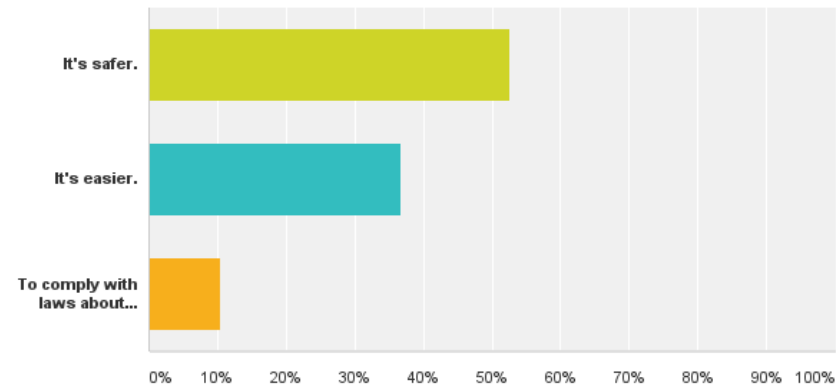
- Built-in speech recognition system
- After-market navigation systems
- Mobile apps

Built-in Speech Systems

- 39/50 have built-in system
 - Every participant who had one uses it
- 74% use it every time they're in the car, 100% use it at least a few times a week

Q6 What is the most important reason you use the speech recognition system that's built-in to your car?

Answered: 38 Skipped: 14



Opinions of Built-in Speech Systems

Users who
Strongly Agree or
Agree

Rate on 7-point Likert scale
Strongly Agree – Strongly Disagree

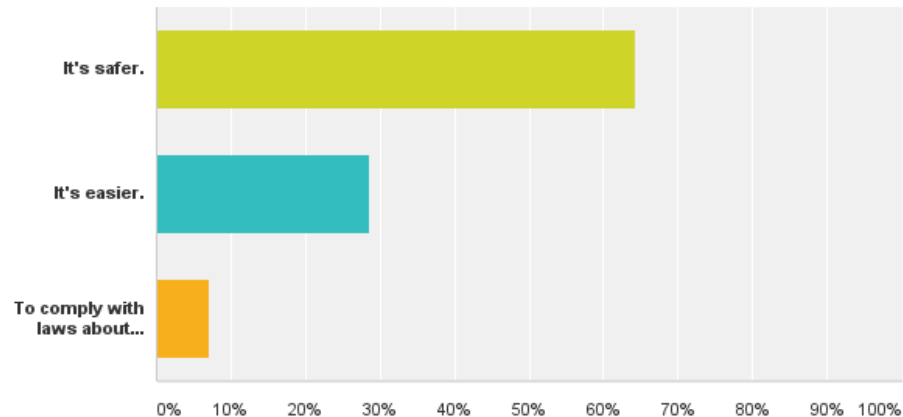
- 92.1% ■ My car's built-in speech system is **easy to use**.
- 92.1% ■ I can complete my tasks **quickly** using this system.
- 81.6% ■ My car's built-in speech system is logical and organized.
- 76.3%** ■ My car's built-in speech system usually **understands what I say**.
- 78.6% ■ I trust my car's built-in speech system to work correctly.
- 78.6% ■ My car's built in speech system has a pleasant voice.
- 81.6% ■ I feel confident using my car's built-in speech system.

After-Market Navigation Systems

- 33/50 have built-in system
 - 5 participant have a system but don't use it
- 50% use it every time they're in the car, most use it at least a few times a week

Q11 What is the most important reason you use the speech recognition with your navigation system?

Answered: 28 Skipped: 24



Opinions of After-Market Nav Systems

Users who
Strongly Agree or
Agree

Rate on 7-point Likert scale
Strongly Agree – Strongly Disagree

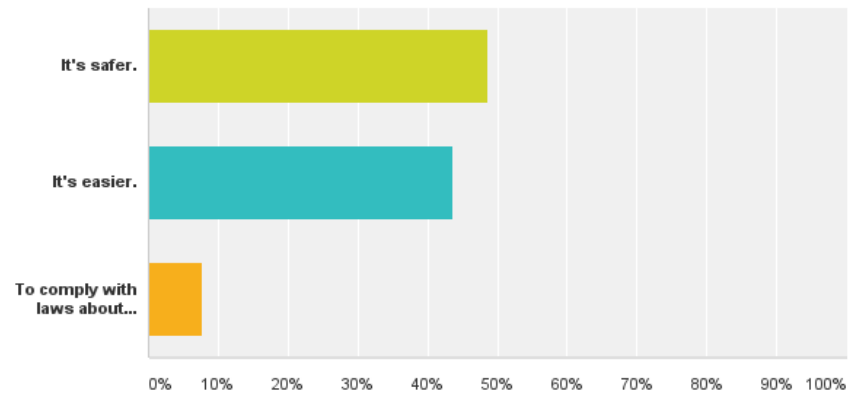
- 78.6% ■ Using speech with my navigation system is easy.
- 75.0% ■ I can complete my tasks quickly using speech with my navigation system.
- 82.1% ■ The speech recognition in my navigation system is logical and organized.
- 64.3% ■ My navigation system usually **understands what I say**.
- 71.4% ■ I trust speech recognition in my navigation system to work correctly.
- 74.9% ■ My car's navigation system has a pleasant voice.
- 71.4 % ■ I feel confident using my navigation system.

Mobile Apps

- 39/50 use speech-enabled apps in the car
 - 9 have speech apps but don't use them in the car
- 61.5% use them every time they're in the car, 38% use them at least a few times a week

Q17 What is the most important reason you use this mobile app in the car?

Answered: 39 Skipped: 13



Opinions of Mobile Apps

Users who
Strongly Agree
or Agree

Rate on 7-point Likert scale
Strongly Agree – Strongly Disagree

- 87.2% ■ Using speech with the mobile app is easy.
- 89.7% ■ I can complete my tasks quickly using speech with the mobile app.
- 87.2 % ■ The speech recognition in the mobile app is logical and organized.
- 74.4% ■ The mobile app usually **understands what I say**.
- 82.1% ■ I trust speech recognition in the mobile app to work correctly.
- 76.9% ■ The mobile app has a pleasant voice.
- 82.1% ■ I feel confident using speech recognition with the mobile app.

What do you like best about using speech recognition technology in the car?

“I can **multitask** and make use of what would be wasted time sitting in traffic.” (2011 Chrysler Town & Country)

“It is safe, recognizable, quick, **chic, & modern!!**” (2013 Toyota Prius)

“Very easy to use. Helps get to the options in my car easily and quickly **without me having to search through the menus.**” (2014 Lincoln MKX)

“It's easy and safe because I'm not taking my eyes off the road. It also feels like your **personal assistant**. Just say what you need done and you're taken care of.” (2014 Chevrolet Volt)

What's the biggest problem with using speech recognition technology?

Recognition accuracy (80%)

None

Technical

Design

Why the high satisfaction scores?

Motivation+ Good Enough Performance = Investment

Investment - Awareness of Better Alternatives
= High Ratings

Next Steps

Field observations
Identify design patterns
Usability test alternatives
Develop design guidelines

Thank you!

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