



**Udo Haiber**  
COO, SVOX

Motivation

Connected Speech Services

Effects on Users

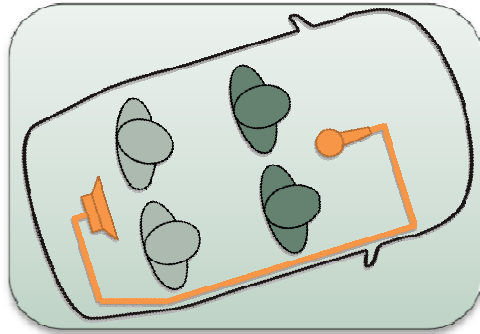
Effects on Speech Technology

Effects on Stakeholders

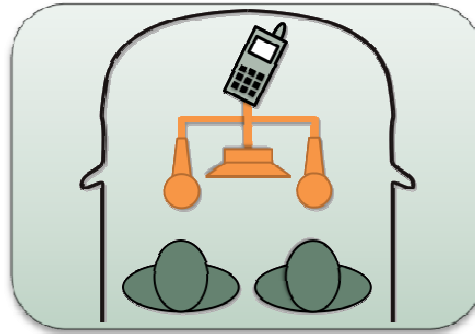
# ABOUT SVOX

The Fully Networked Car  
Geneva, 3-4 March 2010

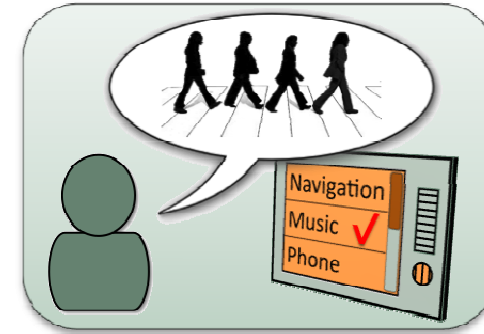




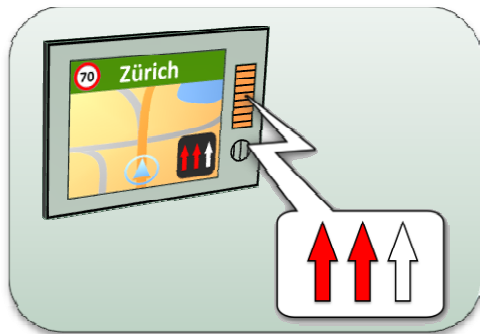
In-Car  
Communication



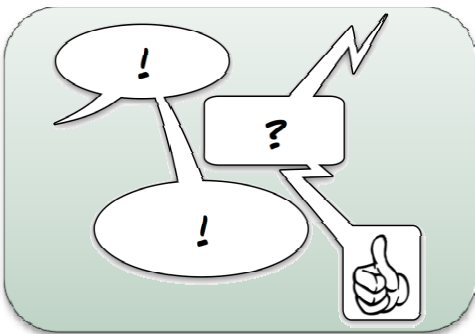
Acoustic Signal  
Enhancement



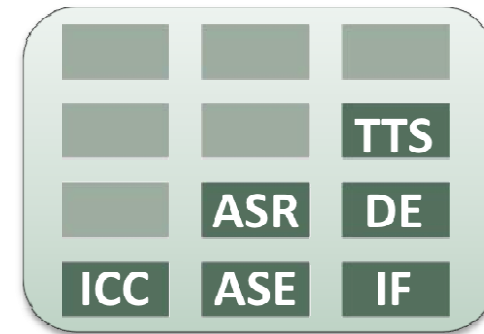
ASR Engines



TTS Engines



Dialog Engine

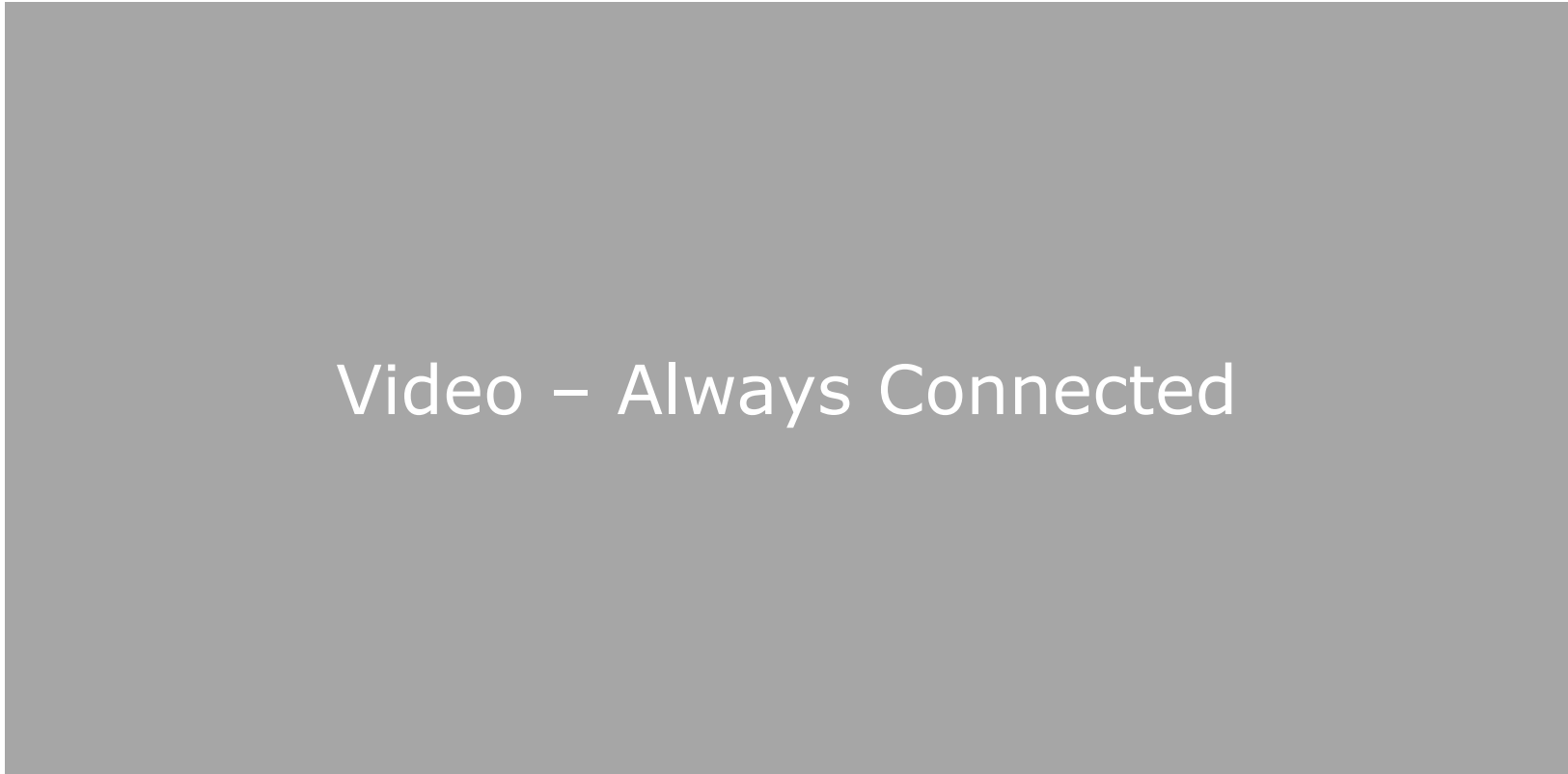


Integration  
Framework

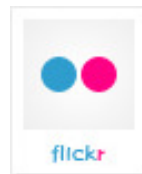
# MOTIVATION

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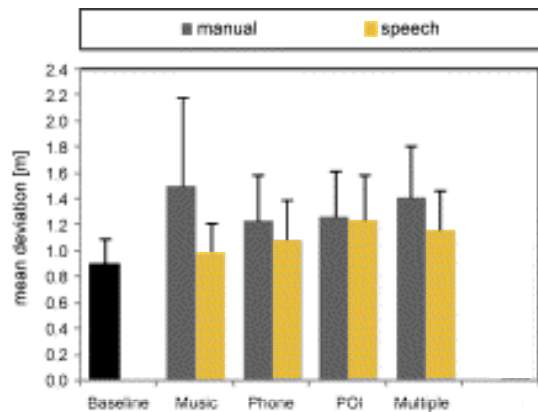




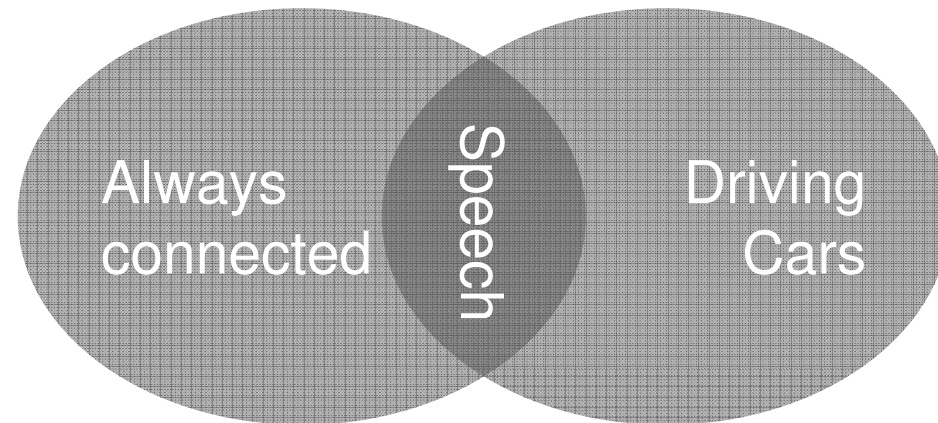
Video – Always Connected



- Always connected generation wants to use mobile internet also in cars, BUT...
- Driving safety must not be decreased



Maciej, J. & Vollrath, M. (2009).  
Comparison of manual vs. speech-based interaction with in-vehicle information systems.  
Accident Analysis and Prevention, 41, 924–930



☞ **Speech as hands-free, eyes-free solution**

# CONNECTED SPEECH SERVICES

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# Todays In-Car Services

Communication	SpeechInp	SpeechOut	Connected	LBS
Phone / name dialing	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
SMS, eMail		<input checked="" type="checkbox"/>		
<b>Driving support</b>				
Destination input / directions	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
POI search				<input checked="" type="checkbox"/>
Traffic messages		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
<b>Infotainment / Convenience</b>				
Music, Video	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
<b>Safety &amp; Security</b>				
eCall			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>CRM</b>				
Remote Diagnostics			<input checked="" type="checkbox"/>	

Communication	SpeechInp	SpeechOut	Connected	LBS
Phone / name dialing	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
SMS, eMail	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Social networks	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Twitter	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<b>Driving support</b>				
Destination input / directions	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
POI search	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Business Listing	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Traffic messages	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Floating Car Data			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Parking	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Speech Traps		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Eco driving			<input checked="" type="checkbox"/>	
<b>Infotainment / Convenience</b>				
Music, Video	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Travel Guide	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Weather	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
News, Stocks, Sports	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Wiki	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Events	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Shopping	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Calendar	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Web browsing, searching	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<b>Safety &amp; Security</b>				
eCall			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Stolen Vehicle Tracking			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>CRM</b>				
Remote Diagnostics			<input checked="" type="checkbox"/>	
Vehicle Homepage			<input checked="" type="checkbox"/>	
SW-update / App store			<input checked="" type="checkbox"/>	

# EFFECTS ON USERS

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## Traditional Users

hierarchical browse

prepare, plan  
things to do

privacy concerns

single-tasking

## Always connected Generation

keyword search

more spontaneous,  
cause everything is available  
always and everywhere

expose privacy

multi-tasking

# EFFECTS ON SPEECH TECHNOLOGY

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## Engine

- Large vocabulary fuzzy matching
- Embedded vs. server follow data => hybrid
- Enrollment vs. Pre-defined vocabulary

## User Interface

- Hands-free mode needs DIALOG to present and select from possible answers
- Seamless integration of on-/offboard interaction (e.g. One voice, one concept,...)
- Extensibility
- Traditional approach as legacy feature

## Prompt text length increases (e.g. eReader)

- Naturalness must be increased, in order not to bore listeners
- Audio-Streaming of Server TTS

## Prompt text dynamics increases (e.g. RSS feed)

- Pure TTS prompts, no pre-recording (as for turn-by-turn nav) anymore
- Learning TTS (adaptive)

## Prompt text less well-formed (e.g. Mail)

- Focus on text pre-processing
- Robust language identification used to handle polyglot texts
- 2D-structures to enable mail, web content

# EFFECTS ON STAKEHOLDERS

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## Commercial Side

- More players, more complex business models
- Traditional: OEM, Tier1
- Future: OEM, Tier1, Carriers, Handset-OEMs, App Stores, Content/Service Provider

## Technical Side

- More developers (app store) not only Professionals
- need for open software concepts with risk of reduced Quality Assurance

## Legal Side

- Responsibility for recalls, accidents, etc.
- Liability

# SUMMARY

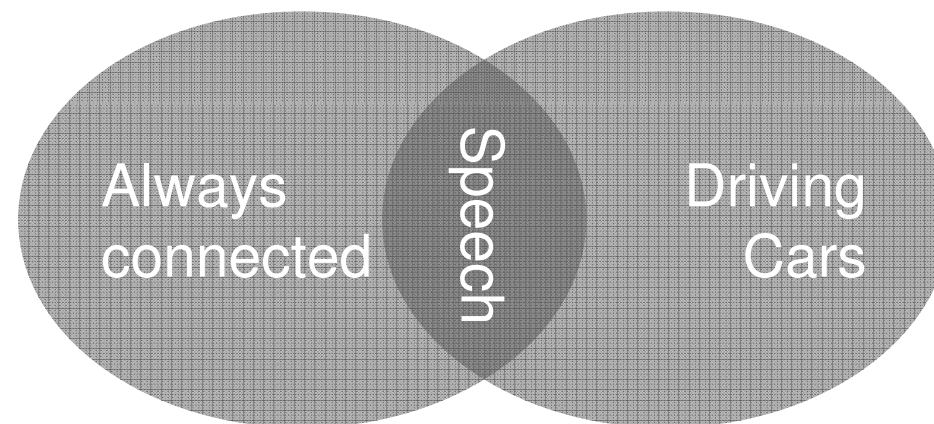
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Speech solutions exist now for decades, but acceptance will increase remarkably with this new field, because...

Speech is advantageous over traditional UI's, when searching large lists especially in automotive environment

Products showing this advantage will enter the market place already this year





## Contact

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