General Personal Assistants

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<table>
<thead>
<tr>
<th>Statistic</th>
<th>Number</th>
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<tr>
<td>7 billion mobile cloud transactions annually</td>
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<tr>
<td>12,000 employees</td>
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<td>80+ languages</td>
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<td>5 billion lines of medical data transcribed annually</td>
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<td>4,100 patents &amp; applications</td>
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<td>65+ countries</td>
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<td>800 million mobile keyboards shipped annually</td>
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<td>14+ billion customer engagements per year</td>
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<td>15,000 mobile app developers</td>
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<td>1,200 voice and language scientists and engineers</td>
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The Evolution of the Personal Assistant
Today’s Personal Assistant

An always there companion ready to simplify and streamline your life

- Productivity, device and app control
- Conversational UI
  - Speech input
  - Natural, human-like speech output
- Semantic web search
- Handset-focused initially
- Expansion to tablets, desktops, autos and more
An Inflection Point

Revolutionary shift from task-centric to user-centric

Speech Recognition
- Command & Control
- Dictation
- Search
- Natural Language

Intelligent Systems
- Understand
- Inform
- Be Aware
- Ubiquitous

6 billion mobile handsets
70+ languages
65+ countries
The Future of the Personal Assistant

Smarter, more aware, personalized and always accessible

- Contextual awareness
- Advanced hands-free access
- Smarter notifications
- Personalization
- Ubiquity
- Advanced reasoning

Gluten-free waffles, sir.
# Context is King

Leverage user behavior, device and environmental sensor inputs to augment the intelligence and expand the reach of the assistant

| User       | Device                                       | Environmental                  |
|------------|----------------------------------------------|---------------------------------|---------------------------------|
| • Last app used  
 • Content in focus  
 • Recent contacts | • Accelerometer  
 • Proximity Sensor  
 • Ringer State  
 • Camera | • Location  
 • Weather  
 • Traffic  
 • Time/day | - Resolve anaphora  
 - Enable more natural, conversational interactions  
 - Account for travel trajectory when making recommendations  
 - Enable new modes of hands-free access, improve battery life  
 - Adjust TTS verbosity and feedback mechanisms  
 - Adapt system responses based on user’s environment and mood  
 | - Geo-fenced alerts and recommendations  
 - Proactively notify user to prepare for inclement weather  
 - Alert the user to change route or leave early to get to work  
 - Recommending recipes for Sunday evening dinner at home |
Hands- and Eyes-Free Access

As devices continue to be more tightly integrated into our lives, to invoke and interact with them will become evermore seamless

- Increased number of devices supporting Wakeup Phrase
- Optimizations to reduce power consumption
- Advancements in SSE
- Proliferation across device types and form factors
- Eventual shift to more predominant screenless interactions
Smarter Notifications

The assistant employs ‘agents’ that take action based on user data, events and environment

**User-generated**

“Hold all of my calls except from my wife.”

“Let me know if the Bruins win tonight.”

“When I get home tonight, send a text to Theresa.”

**Assistant-generated**

Based on calendar and appointments

Location-based if in a new area

Based on music and other media preferences
True Personalization

The assistant will adapt and mold itself to the user
Ubiquitous Access

A seamless experience on every screen

- Users can continue an experience easily with natural language input
- Actions and preferences from one platform can more effectively influence another
- Shift from multiple disjointed experiences to a more closely aligned, holistic experience
Advanced Reasoning

A rich understanding of cross-domain knowledge to enable advanced interactions

- Movie theater schedule
- Traffic conditions
- Wife’s favorite movie actors
- Meeting schedule
- Babysitter’s availability
- Kids’ soccer games
- Favorite cuisine
- Restaurant availability

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Thank you