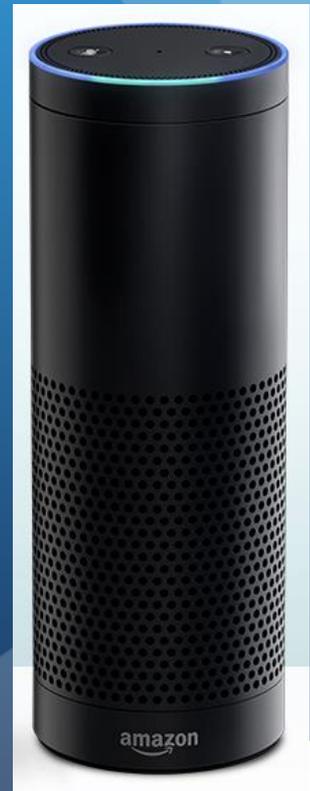
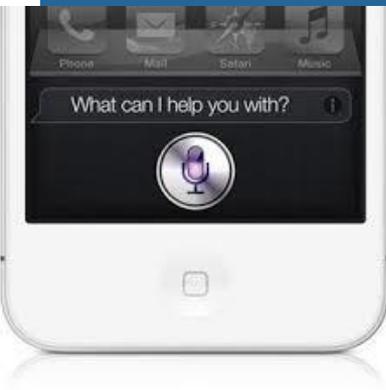
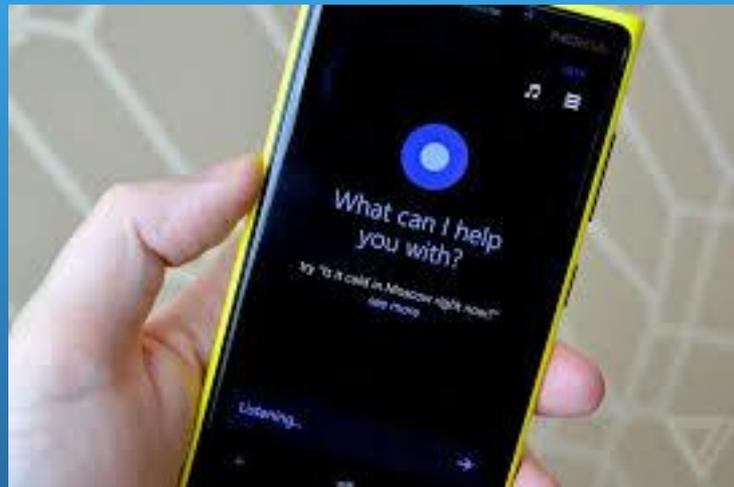
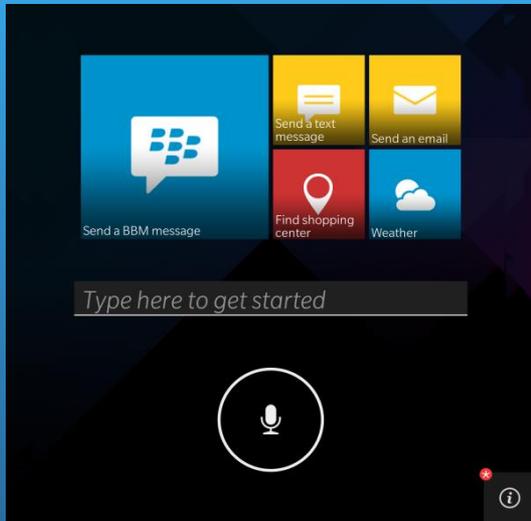


COMPANY-SPECIFIC VIRTUAL ASSISTANTS: NECESSITIES AND POSSIBILITIES

William Meisel

President, TMA Associates
Editor, Speech Strategy News
Author, The Software Society

Personal Assistants that try to do everything



Defining feature: “Natural language” interaction

- Minimal prompting
- “What can I help you with?”

Single-utterance vs. Dialog

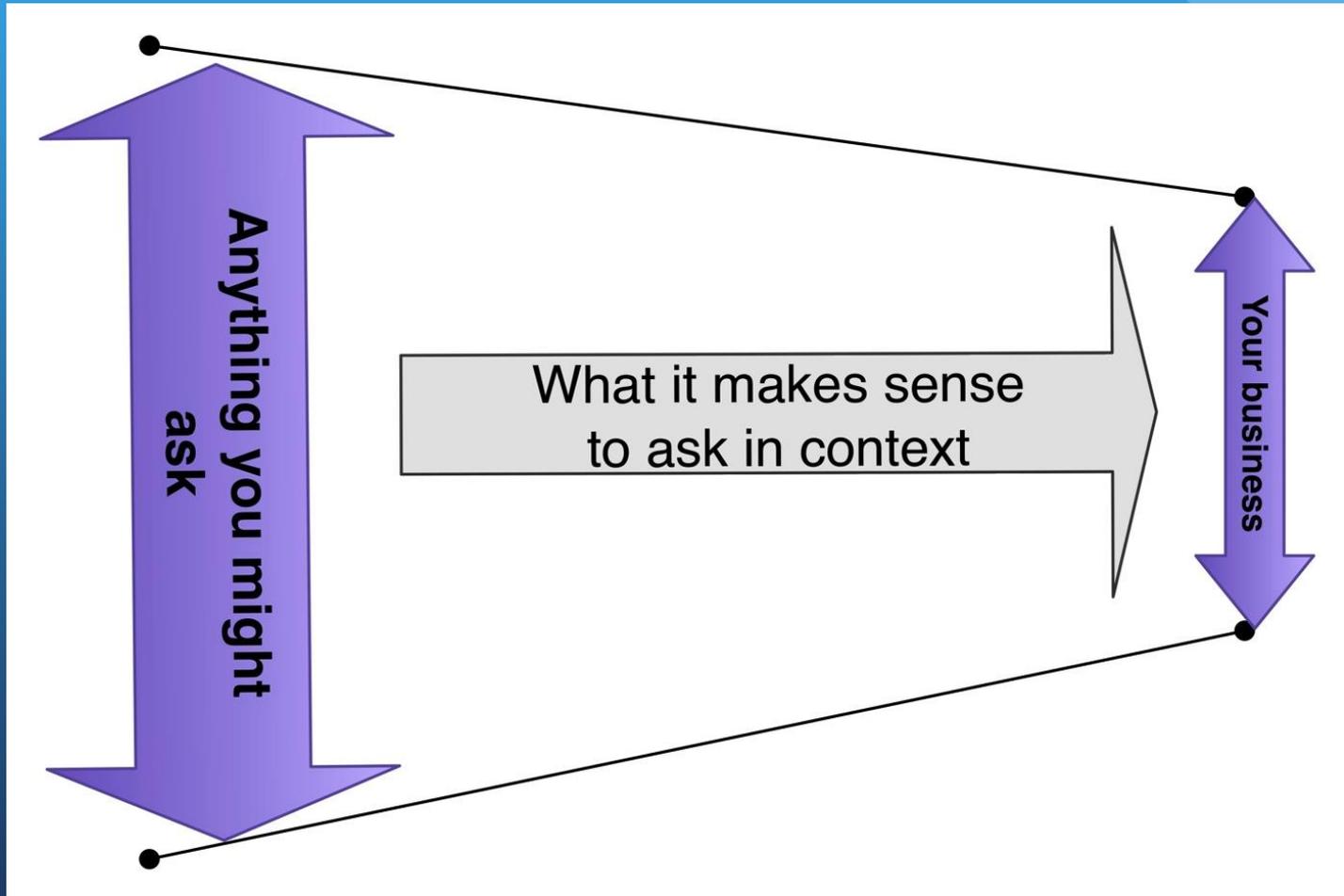
- Treating a request as all you know

Versus

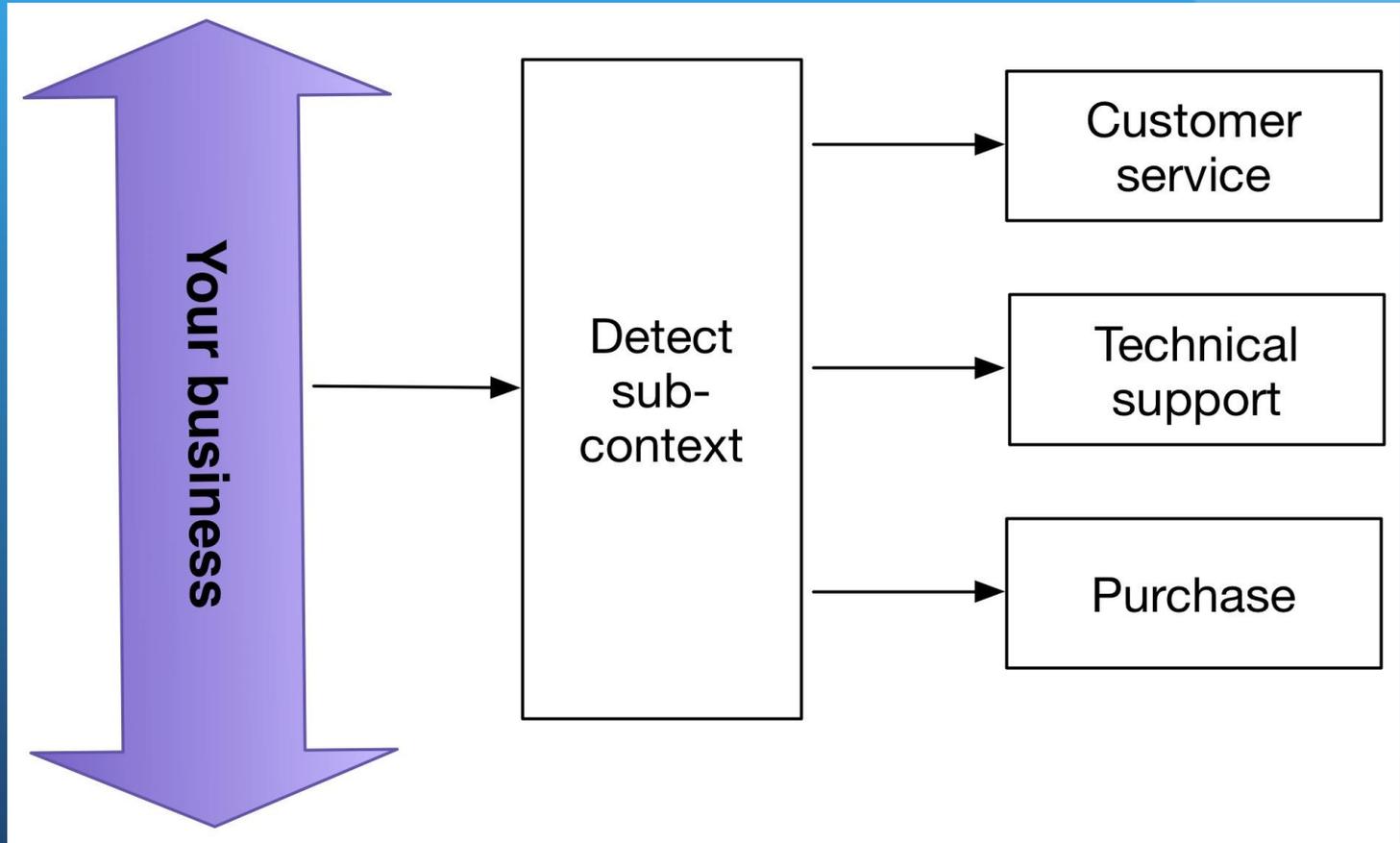
- Creating a dialog, a conversation
 - “What time of day do you want to fly?”

Company-specific virtual assistants

- Natural language interaction with more limited context



Further narrowing of context



Types of specialized virtual assistants

- Customer-facing
 - Interaction with your company supporting its products and services
- Employee-enabling
 - Employees interacting with each other and with enterprise applications
- Specialized services (Web sites or “apps”)
 - Specific activities and services

Customer-facing: Customer service



“Please tell me why you are calling”

Customer-facing: Sales & Marketing

Mobile Voice

Conference 2015

The Intelligent Connection

the Sainte Claire Hotel San Jose, California - April 20-21, 2015

[Register Now](#)



Two major trends converge



Always-available connection
to computer services

A fundamental change in
the user experience
and user expectations



Advances in speech recognition
and natural language interpretation

The maturing of speech and natural language technology is changing user expectations of the ease of interacting with increasing numbers of devices, applications, services, and features - "digital overload." Mobile devices make this intuitive connection to computers always available. The Mobile Voice Conference is dedicated to helping companies understand how they can be improved by internal efficiencies and/or engage customers using this technology.

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Customer-facing: Advertising

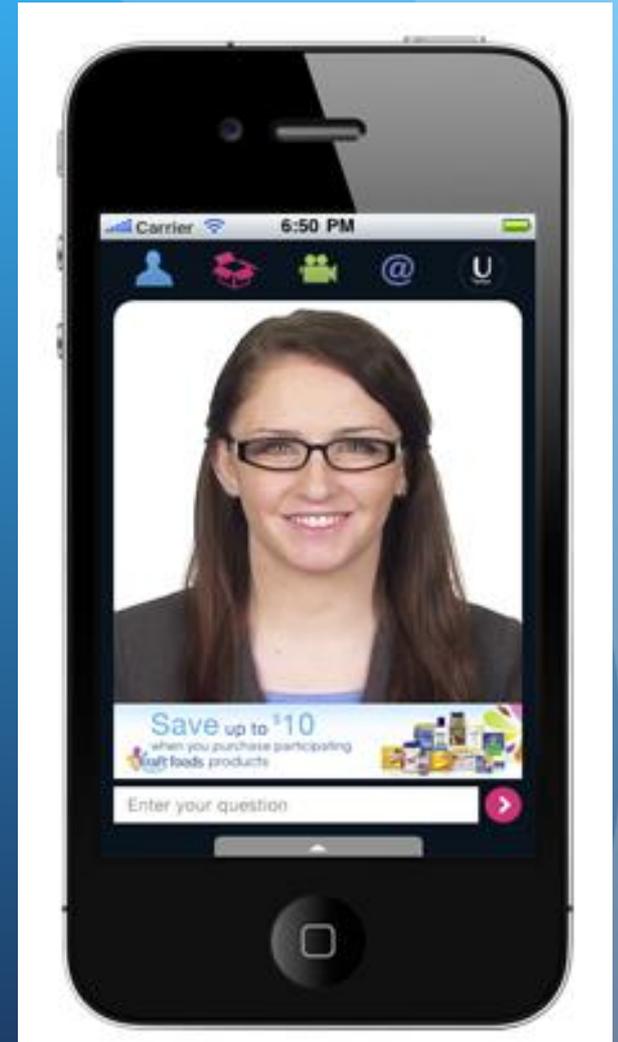
“Future of Advertising: ‘Chatvertising,’ or
Talk to the Bot”

Christopher Mims, *Wall Street Journal*
(July 28, 2014)



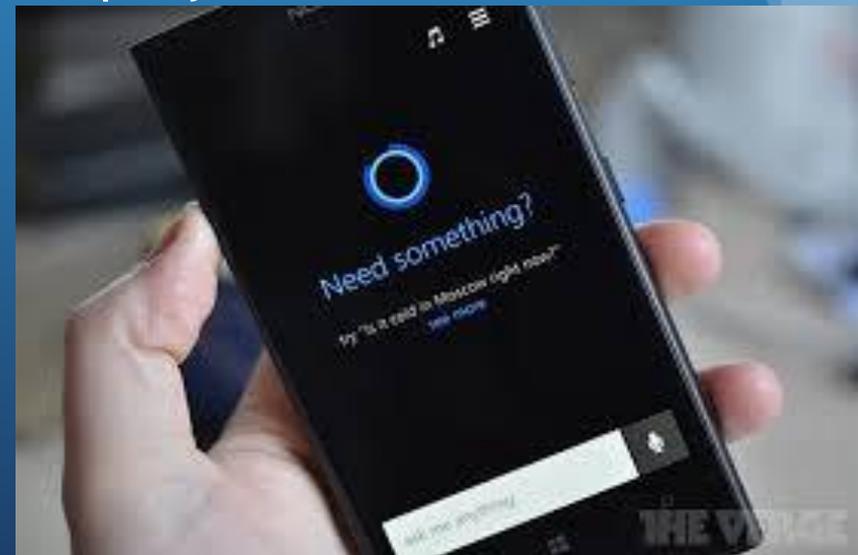
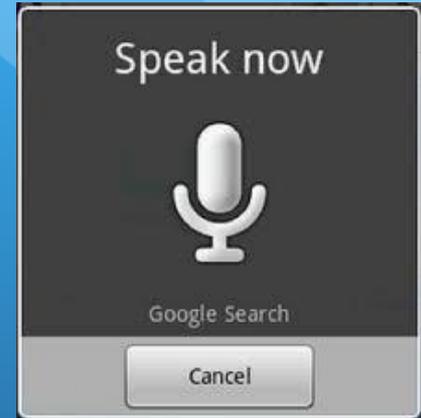
Customer-facing virtual assistant

- Representing and branding your company
 - User interface: Voice, text, and/or a visual representation
 - Selective or Encompassing



A single company virtual assistant

- An eventual necessity?
- **General personal assistants become portals**
 - The new web search
 - The new face of computing and the Internet
 - As necessary as a comprehensive company web site



Employee-facing

- Reduce training
- Make employee more efficient
- Improve use of enterprise applications



Specialized assistants

- Analogous to a mobile app or a web site providing services

The logo for AVIOS, with 'A', 'V', and 'S' in gold and 'I', 'O', and 'I' in blue.The word 'WELCOME...' in orange, with a grey audio waveform graphic below it.

Search

A Closer Look at the World of Speech Technology

See videos of AVIOS board members describing their current speech technology passions. Discussions include topics such as teaching, language learning, and more.

[See the videos!](#)

Press Releases

[The Samsung Smart TV privacy issue represents a "deep misunderstanding of reality," industry organization argues](#)

[Speech technology industry organization challenges "dire predictions" about AI](#)

[Mobile Devices Drive the Use of Maturing Speech Technology](#)

[Digital Overload Threatens the User Experience](#)

[What's All This About "Wearables"](#)

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How do you do it?

- Data-driven (statistical) approaches
- Linguistic (semantic) approaches
- Hybrid approaches

Data-Driven (Statistical)

- Examples with a labeled outcome (e.g., credit card inquiry)
 - “I need to know my account balance” → “Account balance request”
 - “How much money do I owe?” → “Account balance request”

Linguistic (semantic)

“I need a room tomorrow at the Orlando Marriott, and I want to bring my poodle”

```
Obtain: Target: sArrivalDate extraction: MatchingEntityOnly normalization: Conditional condition: family=93100; |family=95009; |family=91865; |hypemym=90923; |family=91948; |hypemym=83130.style1=TALK; |family=667; |hypemym=90905; |family=92140; |  
└─ New value: TOMORROW  
Obtain: Target: sIsNextArrival extraction: MatchingEntityOnly normalization: Conditional condition: family=95926;anotherHypemym=90923;  
Obtain: Target: sIsNextYear extraction: MatchingEntityOnly normalization: Conditional condition: family=95926;anotherFamilyInSameSequence=91143; |family=269;anotherFamilyInSameSequence=91143;  
Obtain: Target: sDepartureDate extraction: MatchingEntityOnly normalization: Conditional condition: family=93100; |family=95009; |family=91865; |hypemym=90923; |family=91948; |hypemym=83130.style1=TALK; |family=667; |hypemym=90905; |family=92140; |  
Obtain: Target: sIsNextDeparture extraction: MatchingEntityOnly normalization: Conditional condition: family=95926;anotherHypemym=90923;  
Obtain: Target: lengthOfStay extraction: MatchingEntityOnly normalization: NumericValue condition: numeral.partOf=1101; |numeral.noHypemym=91177;  
Obtain: Target: lengthOfStay extraction: MatchingEntityOnly normalization: Conditional condition: hypemym=82211.partOf=1101; |hypemym=55811;noHypemym=91177;  
Obtain: Target: hotelName extraction: MatchingEntityOnly normalization: Lemma condition: domain=29512;grammar14=NA; |hypemym=29512;grammar14=NA;  
Obtain: Target: hotelLocation extraction: MatchingEntityOnly normalization: Lemma condition: hypemym=56597; |hypemym=56108;
```

Family IDs, referencing lexicon, create on the fly grammar

	Family ID	Concept
	21178	poodle
parent	21100	Domestic dog
Parent of DD	16922	Domestic animal

What we know;
City = Orlando
Hotel = Marriott
Pets = Allowed

Example: LinguaSys

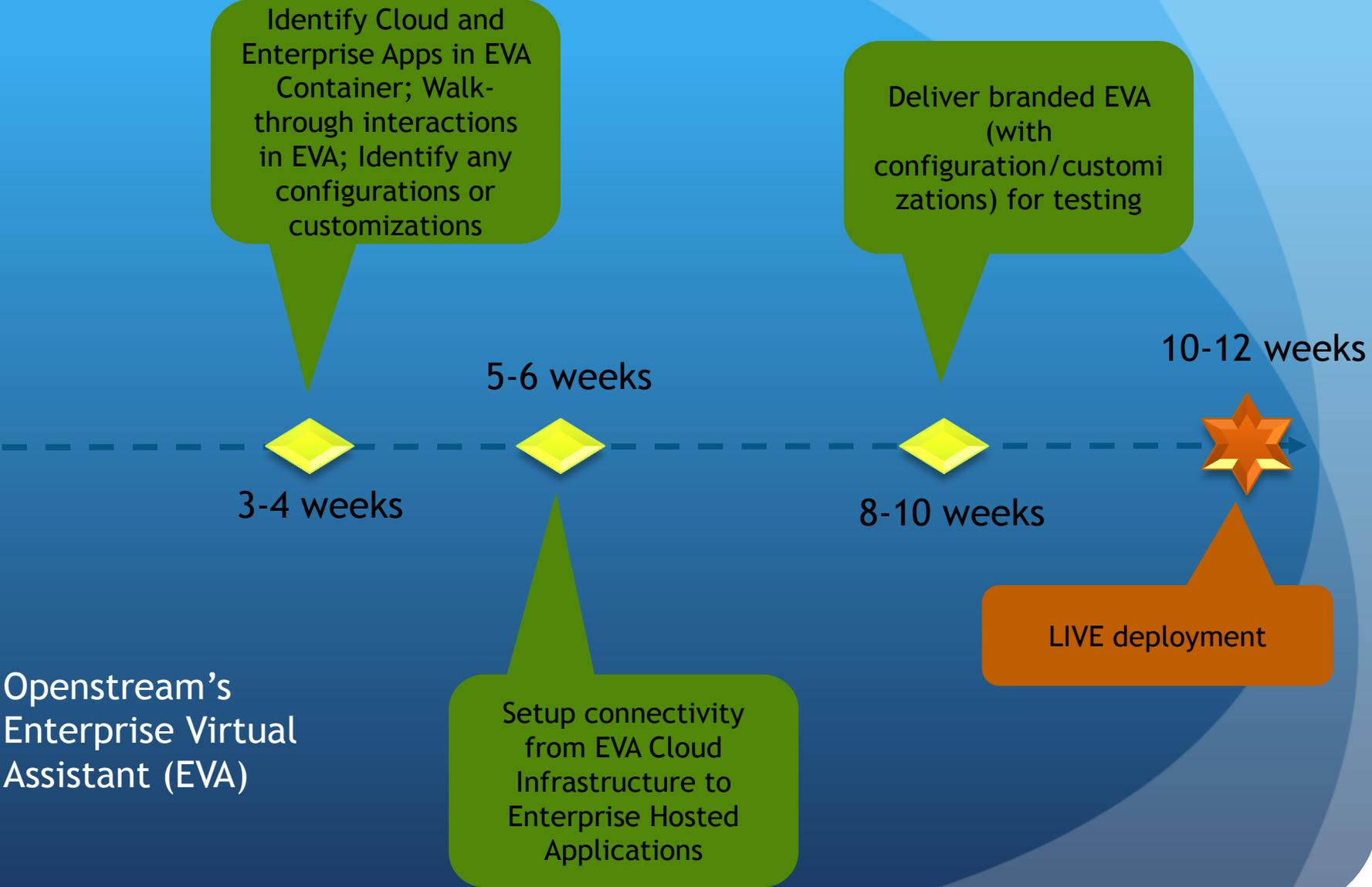
Hybrid

- Problem with data: **New entries**
 - e.g., new product name
- Solution: Use linguistic categories
 - e.g., replace product names in data with PRODUCT.NAME
 - Make PRODUCT.NAME a list that can be updated without redoing statistical analysis

Hybrid

- Problem: **Not enough labeled data**
- Expand data by using semantic equivalents
 - Take an utterance that has “New Orleans” in it and replace it by other cities
 - Take an utterance that has “go to” and replace with “travel to” and “visit”
- “I want to go to New Orleans” → “I want to travel to San Diego”

How long does it take?



Openstream's
Enterprise Virtual
Assistant (EVA)

Identify Cloud and Enterprise Apps in EVA Container; Walk-through interactions in EVA; Identify any configurations or customizations

Setup connectivity from EVA Cloud Infrastructure to Enterprise Hosted Applications

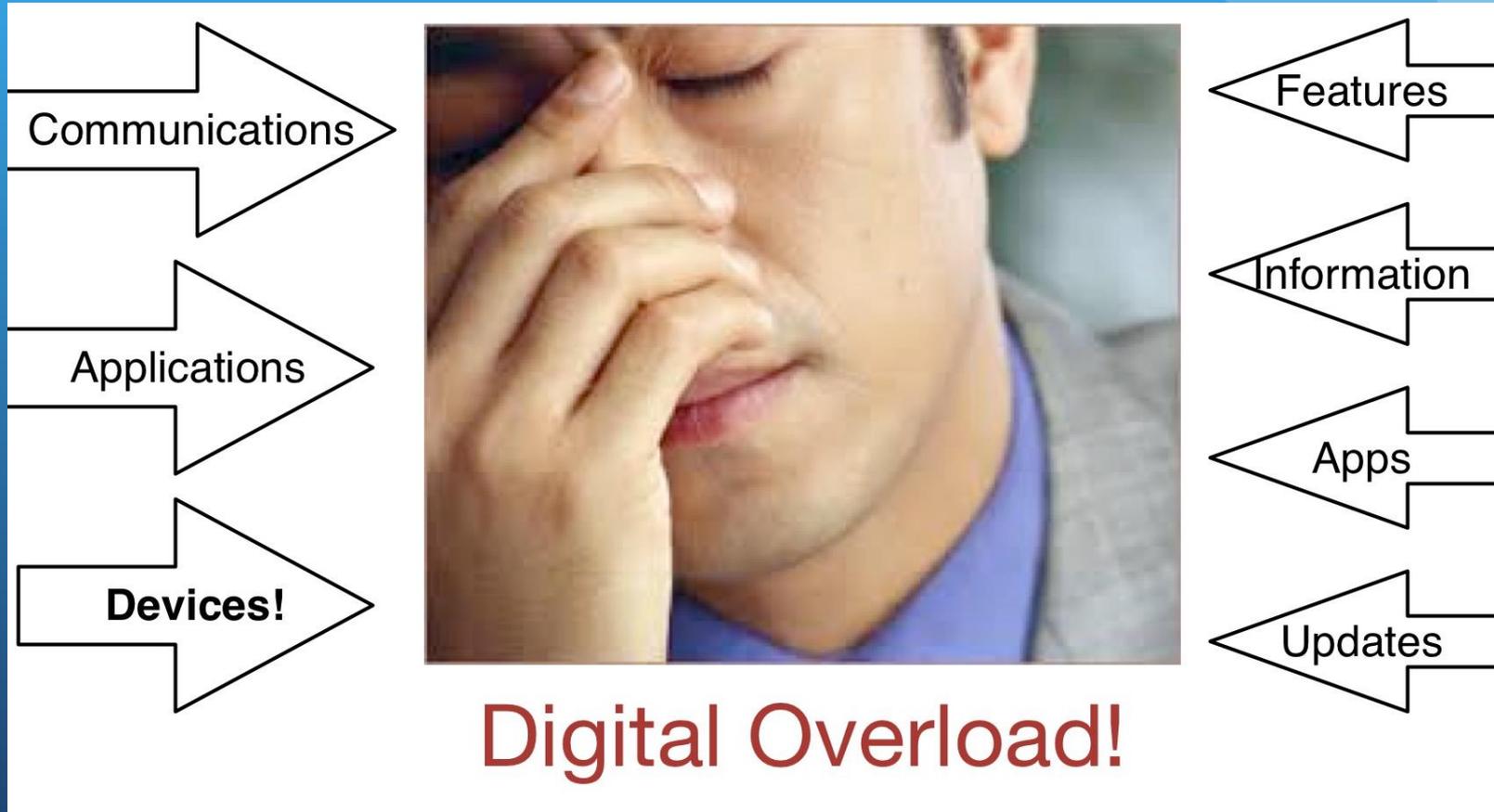
Deliver branded EVA (with configuration/customizations) for testing

LIVE deployment

Expand user base slowly

- Learn from alpha and beta tests

The core problem natural language addresses



Contact

- William Meisel
- wmeisel@tmaa.com
- (818)708-0962