Google DialogFlow Training Session

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**DialogFlow and Conversational AI Overview:**

* Traditional IVR – Touchtone options
* Conversational experience / AI – Natural language understanding, and natural language processing
  + A conversational experience: any voice or chat interface that relies on NLU for interacting with users–not on statis scripts or trees.
  + Synonyms: conversational interface, conversational UX, conversational app, voice bot, chat bot
* NLU – enabling conversation between human and robot in the preferred language of the human
* DialogFlow is a business solution
* 4 of 7 major areas causing bots to fail that DialogFlow can address:
  + Artificial intelligence is still not that accessible
  + They don’t understand context
  + They don’t communicate with existing business systems
  + They lack proper human escalation protocols
* Data provided to agent – Transcript provided to agent, and entities provided to agent (entities is pertinent data). Agents also get a summary of the call
* Disambiguation with intents not existing functionality yet, it is something Google working on
* DialogFlow - Platform that provides tools to provide interfaces for conversation between robot and human
* DialogFlow CX is for building large and complex conversational UI’s
  + Integrates the best of Google’s NL AI
  + AoG
  + TTS (text to speech)
  + STT (speech to text)
  + Knowledge service
  + Google telephony
  + NL sentiment
* Alfred is Batman’s butler
* Why is CX different from other platforms?: CX makes bots government compliant while still available and easy to the everyday user.

**DialogFlow Deep Dive:**

* State-based (fixed) with supplements (allows you to veer off flow).
* DF uses Visual Flow Builder – graphs each flow as a conversational state machine diagram, which makes complex agents easier to design and understand
  + Horizontal or vertical tree diagram
  + Better overview of flow
  + Easy maintenance
* Flows – complex dialogs often involve multiple conversational topics
  + Used to define these topics and associated conversational paths
* Pages – flows are a series of pages with rules on how to transition between them
  + DialogFlow conversation can be described and visualized as state machine. The states of a CX session are represented by pages.
  + Contains: Fulfillments, Form parameters, State handlers
* Forms – each page, define a form – a list of parameters that should be collected from end-user for the page
* Intents – categorizes end-users intention for one conversation turn.
  + Intent Matching – when a user input matches an intent through training phrases
  + Intents have been dramatically simplified: no longer a building block for conversational control
  + Contains training phrases, are reusable
  + Limited in scope, not *first class* citizen
  + Need to provide at least 10 training phrases for one intent.
* Entities – how data from end-user input is extracted
  + Entity type – defines the type of information you want to extract from user input
  + Entity entry – for each entity type, there are many entity entries, each entity provides a set of words or phrases that are considered equivalent
  + System entities – DF provides many system entities to extract common types from end-user expressions. E.g. @sys.color type can be used to tract values like red or blue
  + Custom entities – created for matching customer specific data. E.g. could define the social-benefit entity type that can match the types of social benefits an individual can apply for.
* Parameters – used to capture and reference values that have been supplied by end-user during a session. Each parameters has a name and entity type
  + Intent parameters – intents use parameters to extract data provided by end-users when intents are matched
    - Intent parameters references can be used in statis fulfillment response messages of intent routes.
    - You can reference the original value or the resolved value.
  + Form parameters – for each page, you can define a form which is list of parameters that should be collected form end user for page.
    - Not used directly. You can only check the fill status of an individual form parameters or the form as a whole.
    - You can use these form statis references in a condition requirement of a condition route.
* Example: Parameter would be DOB, Entity Type is @sys date-time, form would be tracking DOB, name, SSN, so tracking multiple parameters
* Intent parameter – can be used in statis fulfillment response messages of intent routes - “original” example will be “Fiji”, resolved will be “apple”
* Form parameter – references are not used directly.
* State Handlers – general naming for various transition options. There are 2 types of state handlers
  + Routes – possible fulfillment or moving from a page to another page: intent routes (once intent is matched), condition routes (when condition is true)
  + Event handlers – when event is triggered
  + To make routes reusable, you can define route groups.
  + Route groups: customer deviations (“supplementals”)
* Fulfillments – agent response, may contain:
  + Static response messages,
  + Webhook calls for dynamic responses
  + Parameter presets to set or override parameters values
* Rich response messages – platform-specific and can be used to provide the end-user with more than just text responses. Ex: Yes button and No button.
* Dual Tone Multi-Frequency (DTMF) - available when using telephony integrations, end-user generations specific sound by entering a number on keypad instead of speaking
* Barge-in – requires advanced speech settings to be enabled in agent settings
  + When enabled, an end-user can interrupt DialogFlow response audio
  + When interrupted, Dialogflow will stop sending audio, and will process the next end-user input
* Reprompt handlers – used to provide responses
  + No input – DF receivers empty end-user text input
  + DF receives empty end-user audio input
* No match – end-user input does not match any intents in a flow
* Auto speech adaptation
  + Needs to be enabled in speech and IVR section of agent settings
  + Automatically uses conversation state to pass relevant entities and training phrases as speech context
  + Improves the speech recognition accuracy of your agent
  + Takes context of entire sentence to identify intent
* Reusability – intents are reusable, flows are reusable
* Testing – build in testing, mock webhooks,
  + test cases – built-in save and replay test cases
  + Simulator used to test your agent
* Change History – all changes to DF
* Backup – agent backups are complete snapshots of current states of agents

**Conversation Design:**

* Conversation design – design language based on human conversation. More an interface leverages human conversation, the less users have to be taught how to use it
* The cooperative principle – for conversation to work we rely on each other to be as truthful, informative, relevant, and clear as the situation warrants
* Six essentials for conversation design:
  + Design for context (who is using this? What situation are they in?)
  + Design your brand persona
    - Write end-to-end sample dialogs between the user and your brand persona
  + Have the conversation – introduce brand persona, provide user a clear path forward, be natural and brief but add your persona, ask easy questions – avoid information overload
  + Design with context sensitive repair – assistants should be forgiving
  + Think cross-platform, or cross-channel
  + Design for frequency – 1) good morning 2) hi peter, how can I help? 3) hey peter, this is road work today on your route
* What are we listening for when designing conversations?:
  + Does it sound like a conversation people would actually have?
  + Is there context?
  + What is the persona? Consider formality and consistency, forward and back pointing, contractions
  + Are there discourse markers for cohesion?
* Content sensitive repair: virtual assistants should be forgiving
* Intents recommendations:
  + Intents should have at least 10 training phrases
  + Have as many vetted, varied, and real world examples as possible

**Q&A:**

**1. Is the DialogFlow able to store new information (unrelated question) during a conversation and get to it later?** Yes

**2. Do they have their own platform for email or VEText?** Yes

**3. What does DF’s sentiment analysis use?** It just analyzes text, not emotion. Transfer can be trigger at a particular sentiment score.

**4. Can DF answer an out of context question and get back on track during the same conversation?** Possible

**5. Can DF transfer the information to the live agent? Yes**, in a summary form and in transcript form. DF can extract certain entities, such as caller name.

**6. Can the DF understand a mix of language (Spanish & Eng) or just one language throughout the conversation?** Just one language at a time. However, DF, can understand simple phrases in different languages when mixed in with another language.

**7.** **Can DF provide additional/add-on services?** Yes, but it’s a business decision

**8. Can DF differentiate "o" with zero For SSN?** Yes

**9. Does DF know a phone number is 10 digit and SSN is 9?** Yes, but if ID is 9 digit we need to provide it with conversation training.

**General Answers:**

10. There is one system time out, but each page is completely customizable for time outs and routing.

11. Parameters are stored in a log – if enabled, it can be stored in a file also information such as SSN can be redacted from the log

12. Version control, changes history and backups are available

13. Supports environments – prod, testing, etc.

14. Data roll up can be done in multiple language to run query etc. (insights Dashboard)

15. Rolls up in the language the user is speaking. But can be done in one language. Also, insights can combine intents without language for analytics.

16. Google AI is never allowed to make a decision for you.

17. DF recommends providing FAQ or curated contents in a particular format to answer users’ questions in the beginning.

18. VA – business decision to have a mega agent and sub agent. DF can have higher level flow and route it to more granular level flow withing the same agent.