

Flip's Retail & eCommerce Voice Assistant

High-Level Conversation Technology Overview

Abstract—This one-pager provides a high-level overview of the conversation technology that powers Flip's Retail & eCommerce Voice Assistant (EVA). Boasting several advances in Natural Language Understanding, Intent Classification, and Dialogue Flow, EVA is the leading product in the space that allows clients to automate a plethora of customer intents and to provide existing agents with an unparalleled insight into the needs of each caller before even picking up the phone.

I. INTEGRATING VOICE CONVERSATION

FLIP uses proprietary technology to enable a voice-based conversation with a retail or eCommerce customer calling into an existing customer service line, understanding their specific intent, and either resolving it via automation, or providing additional context and information to the agent or specific queue the call is forwarded to. This is done without the use of keypad presses, and allowing the customer complete autonomy in what they say. Flip generally requires an integration to obtain customer data (typically an Order management System (OMS) such as *Shopify* or *Salesforce*), an integration to handle telephony (such as *Aircall* or *Genesys*), and a helpdesk integration to push call information to (such as *Gorgias* or *Kustomer*). Flip works with over 80+ partners¹ to ensure each API integration is secure, accessible, and easy to implement for the client. Flip also works with many clients using an in-house OMS requiring a custom API integration. Flip's architecture ensures that such custom integrations are seamless and quick to implement with the same rigor of security standards.

II. INTENT TAXONOMY

Flip's retail & eCommerce classifier and extensive intent taxonomy is best-in-class. Unlike current solutions, which focus on a limited set of generic customer service categories, Flip has developed a highly-granular and diverse intent taxonomy, built using years of continued proprietary research. Flip's core intent taxonomy spans over 150 interconnected taxonomic elements (with intents such as `SUBSCRIPTIONS.MODIFY_SUBSCRIPTION.SKIP_NEXT_ORDER`), and allows for each client's specific intents to be added as required, enabling an in-depth insight into exactly what customers are calling about, and the ability to accurately route them to the most appropriate automation, deflection, or call queue.

Complementing the intent taxonomy, Flip's Natural language Understanding (NLU) engine understands a number of components, including questions, feelings, entities, and dialogue acts (to name a few). By leveraging this information, Flip is able to respond accurately to each caller's response, wherever they are in the flow. Each component is easily extensible, and is hand-crafted for each client during their initial 2-week volume ramp-up period. It is important to note that Flip prioritizes accuracy over recall. This means that if the engine determines something, it is — in essence — guaranteed to be correct. This does also mean that some phrases are unable to be understood by the engine to begin with, although this is reduced significantly after initial learning. There is no generative technology being used; in other words, EVA never guesses.

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¹See <https://marketplace.flipcx.com> for a list of all current partners.

III. CONVERSATION FLOW

Flip's hand-crafted core flow structure ensures that conversations are not automatically-generated, and all calls are routed through a predefined — and logically complex — flow. Unlike the majority of current IVR systems that use voice, trained on "big data", and only make it appear as if a conversation is taking place, EVA is a carefully constructed *stateful* AI, built from the understanding of millions of retail & eCommerce conversations within customer service. Flip's proprietary conversation flow programming language, *CYML*, ensures that conversations held are always within a predefined flow, but when combined with the intent taxonomy and NLU engine, complex enough to be able to handle a wide array of customer responses.

Naturally, there will be many customers who do not wish to interact with an automated voice system, due to bias from prior experience with the status quo of inferior IVR technology. Before resorting to sending them to the operator, EVA will attempt to converse with them, if only to understand why they are calling and to provide this information to the agent. The vast majority of the time, customers will express their intent at this stage, and EVA is then able to proceed to provide the automation for that intent.

IV. METRICS AND TRANSPARENCY

Flip's understanding of intents, turns, and tries, are second-to-none. Flip's ELT has been specifically designed to ingest conversation-based data, and to provide the insight into conversation-specific actions each caller performs. For example, for each conversational turn, whether the outcome was a success, they asked for a representative, they made a mistake, or any other of the 10 outcome classes defined. Our comprehensive portal allows each client to have full control of their instance, and complete access to metrics and transcriptions, offering full transparency.

V. FLIP IS SECURE

Security, compliance, and privacy is the number one priority at Flip. Naturally, Flip is GDPR, CCPA, and HIPAA compliant, adhering — and exceeding — strict European privacy and data security standards. Security is an evolution, and not just something that is installed. We constantly update our threat profiles, patch our software, and regularly penetration-test our servers. Our philosophy is to assume a breach; thus we implement an aggressive defense-in-depth security strategy that includes everything from effective password hashing to complex countermeasures. It is important to remember that *compliance does not imply security; good security is always compliant*.

VI. CONSTANT FEATURE UPDATES

Flip's software evolves each day. Even during the past few months, several new features have been deployed to EVA for all clients to benefit from. These include *No Operator Available Handling* (NOAH), that enables voicemails, transcribes them, and sends both the audio and transcription to an email or helpdesk (this can be turned on all the time, or only during specific hours), *Helpful Hand-Offs*, that enables detailed information from the call to be uploaded to the agent's helpdesk, and *Context-Aware Conversations*, that infuses a conversation with logic based on a customer's contact journey metrics (e.g. how many times have they called about this issue), order journey metrics (e.g. where are they in terms of order progression), and loyalty journey metrics (whether or not they are a loyal customer, either client-specific or defined automatically).