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AI in Telecom Contact Center : A Review of The Latest Trends and Use-Cases for AI Applications in Telecom User Support

Tanmaya Gaur

Principal Architect, Customer Support, T-Mobile US, Washington, USA
tanmay.gaur@gmail.com

Abstract:
Contact Center offer technology capabilities that enable customers to be able to contact an organization or vice versa (organization to reach out to a customer) utilizing services like voice calls, text, messaging etc. Contact center technologies help companies fulfill their customer service obligations and often enable organizations to better personalize the customer experience provided. With recent innovations in the field of AI and ML technology, this new technology has taken center stage in helping businesses better serve customers, increase customer satisfaction, boost productivity, optimize workloads and reduce costs to serve via optimization or automation. This document looks at various emerging AI trends in different areas of a contact center.

Keywords: Contact Center, Call Center, CRM, CSM, Telecom

1. Introduction

Contact centers allow organizations to connect with their customers. In a modern digital first world, contact centers moved from traditional voice-based interfaces to also include various messaging and social media platforms. With the recent evolution in AI, ML & specifically generative AI, the customer support space has seen heightened rate of evolution and change . This document will touch upon the multiple trends and areas AI is impacting in a contact center. The document will attempt to look at possible evolution as these technologies mature and AI implementation gets more and more democratized. The document will also attempt to look at choices and considerations to think through when applying these AI technologies to a contact center stack.

2. Considerations

Let's first go over a very high level and logical breakup of a contact center implementation. This will provide us a good starting structure as we will subsequently go over how AI is being introduced in these different logical areas of a contact center.

2.1. The Logical Contact Center Stack

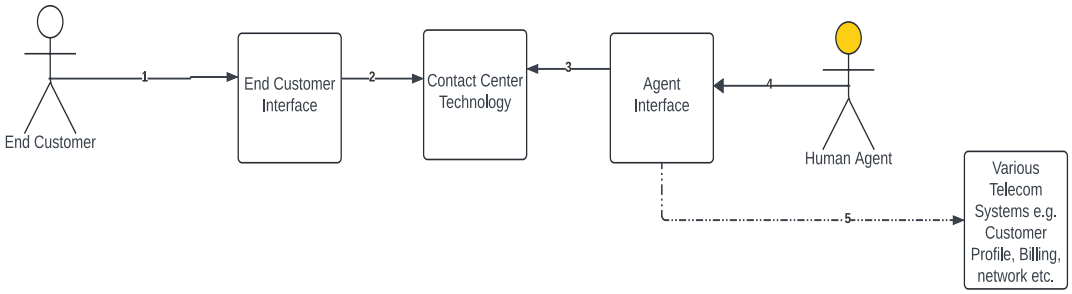

Fig. 1 Logical Contact Center Flow

End Customer This could refer to existing or prospect customers of an organization. Existing customers are individuals or organizations that have purchased goods, services, or products from a business. Prospect customers on the other hand are customers that are interested in making a purchase or the organization is trying to attract.

End Customer Interface This is the user interfaces that allow a customer to connect with the organization. A traditional contact center stack consists of different avenues for an end customer to contact the organization.

Core Contact Center Technology This is the underlying contact center software which may include systems like the exchange, contact routing software etc. This tier also includes capabilities like Interactive Voice Response or Chatbot capabilities. Contact Centers may also include a workforce management aspect.

Agent Interface The contact center will route contacts to agents who use a Customer Relationship or Service Management interface to assist with these contacts. These capabilities could be web or native technology backed which then utilizes API or other integrations to fetch data required to enable agents to service these contacts.

2.2. Emerging AI Applications

This section looks at traditional and evolving areas of AI applications. In later sections, we will try and lay out where these different technologies are playing a role in shaping future Telcom user support solutions. We will also try to layer in the current level of maturity of those areas.

NLP or **Natural Language Processing** allows computers to computers to understand, manipulate, and interpret human language. Applications include translation, spam detection etc.

Computer vision is a field of artificial intelligence (AI) that allows computers to understand and analyze visual content, such as images and videos, in a similar way to humans. Well known applications include self-driving cars, facial recognition, and object detection.

ML or **Machine learning** is a field of artificial intelligence concerned with development and study of statistical algorithms that can learn from data and apply those learnings to perform tasks without explicit instructions. Technology applications include predictive analytics, recommendation systems etc.

Robotics is the branch of AI that deals with the design, construction, and operation of robots. Robots have long been used in a variety of applications such as manufacturing and space exploration but and now expanding into fields like healthcare.

2.3. Emerging trends

This section goes over some crucial trends in telecom user support which may or may not be directly related to AI. That said, AI and modern technology tools have a significant role to play in supporting these innovations.

Digital Self-service is providing way for customers to help themselves without the need to contact customer service. This is achieved by investing in intuitive and simple self-service platforms, creating awareness and customer communities as well as at times chatbots and other automated avenues which take out the human element. This is important to companies as it provides a more convenient option for customers while also helping companies control costs. This also avoids companies achieve scale optimization by not having to grow their customer service footprint linearly with the organization's growth.

Personalization While this goes hand in hand with the digital strategy, personalization refers to providing customers experiences that are best suited to their individual needs and preferences. Some example areas are in improving customer satisfaction by providing solutions quicker and at times to increase sales by better targeting customers.

Multi-modal experiences Another trend closely associated with modern digital customer service, Multimodal experiences can refer to a variety of learning, design, and customer experience concepts that use multiple channels to engage users. This helps companies meet customers where they feel more comfortable and helps keep the exchanges consistent and contextual across various channels. This may also help optimize the customer service experience by allowing customer and service agents to seamlessly switch channels based on what is best suited to the customers need or preference.

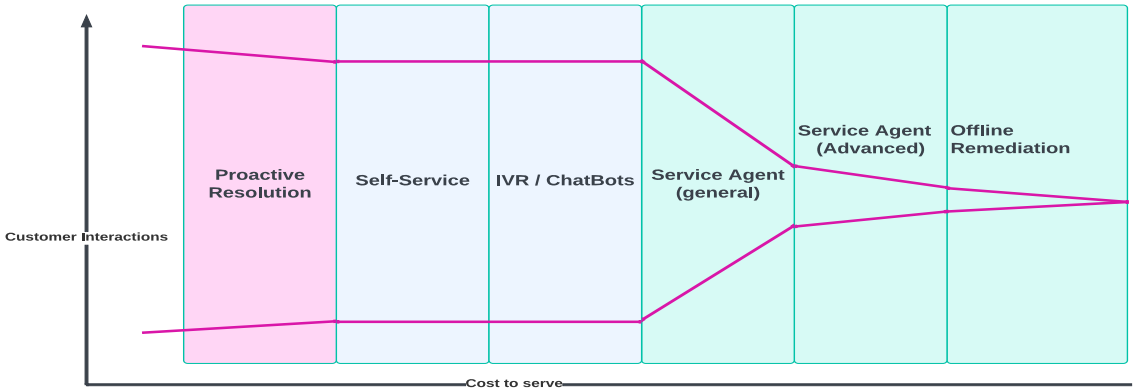

Fig 2 Reactive Support

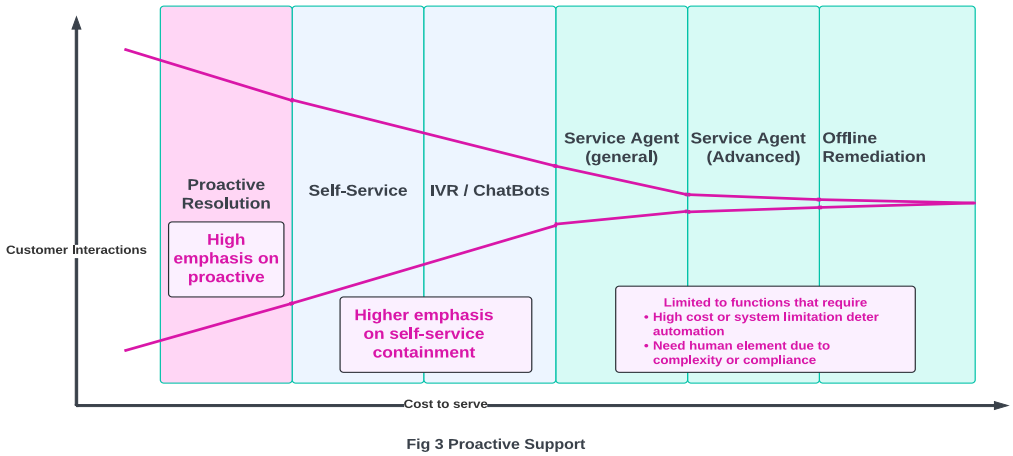

Fig 3 Proactive Support

Proactive v/s Reactive Customer Service proactive customer service is a forward-thinking approach that anticipates and addresses customer needs before they become issues. This is opposed to traditionally Reactive customer service where organizations respond to customer inquiries and complaints upon customer contact. Modern AI and anomaly detection capabilities are providing significant impetus in ability for organizations to turn their customer contacts proactive. More on this in the subsequent sections. Figure 2 and 3 show evolution of contacts as strategy evolves from reactive to proactive customer support.

Containment in a contact center often refers to percentage of interactions resolved without a human intervention. This is another area that has traditionally been served using IVR (Interactive Voice response systems) and chatbots but has seen significant growth with modern AI technologies. This helps reduce call center costs and at times also improves customer satisfaction.

Modern Assistance Channels refers to evolving channels which customers may use to contact an organization. Customer service has traditionally been reliant on Voice calls and E-mails and at times SMS interactions. Modern contact centers go beyond by providing service across social media platforms like Facebook and twitter, instant messaging platforms like WhatsApp and apple business chat. Some companies even have invested in creating meta verse customer service capabilities. Being approacable in these evolving means of interfacing with customers helps with customer satisfaction and at times also helps the organizations to be able to create new target markets for growth.

Build v/s Buy, an organization could decide to write the entire Contact center stack ground up. There is also the option of buying a whole contact center solution. There is often a hybrid approach employed where the contact center may be built of independent vendor and in-house modular tiers integrated together. This applies to modern AI Landscape as well. Various modules may further integrate with AI vendor or in-house capabilities to solution a specific concern within that Tier.

Analytics While analytics data and KPI(s) have long been used to inform a contact center's people, process and technology decisions, the advent of ML, cloud compute and advances in big data capabilities are proving pivotal and making most companies put renewed focus in this space. A key space is anomaly detection which we will touch on in later sections.

Suggested responses enhance agent efficiency and productivity. This is generally powered by using recommendation engines where agent profile and often real-time data is analyzed on the fly (e.g. NLU using voice transcription to identify conversation intent and sentiment in Realtime) to power these suggestions. An extension of this technology is to provide **Next Best Actions** which suggest actions instead of just responses.

Smart Routing utilizes the insights generated by AI to route interactions to the team or individuals best equipped to handle the transaction based on the intent.

3. AI Trends in End Customer interfaces

A typical telecom company supports multiple products and services across different customer segments and may need multiple end customer interface solutions. Traditional interfaces for end customers have long been voice channels where a customer would place a phone call to a customer support line for assistance. These interfaces have expanded over time to include messaging and social media channels as well to meet customers where they want. These web or native interfaces are seeing significant evolution with the boom in AI Tech. This section talks through some key use-cases (refer fig 4).

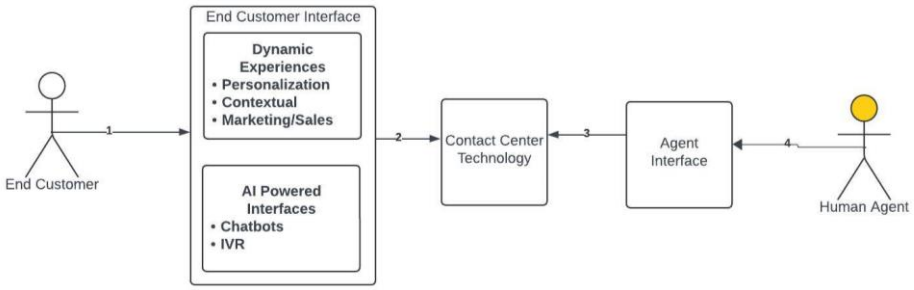

Fig. 4 Key AI use-cases in End Customer Interfaces

One key Area of Growth is the actual code development powering these interfaces just like for web development. This is true for all technology across the contact center. This AI Capabilities apply across multiple aspects of development. Some examples include code generation, testing and debugging, Search Engine optimization etc. This AI area often focuses on improving efficiencies and reducing costs. These capabilities are not highly mature currently and hence there is often high upfront cost and complexity to deal with.

In terms of the actual experience for the end customer, a key area upended by AI is the emergence of recommendation systems. Modern experiences feed off heavily informed, contextual and personalized experiences delivered in Realtime to end customers. These may be marketing and ads to better target and convert a prospect into a customer or upsell offers to increase revenue. There may also be a retention aspect in identifying churn candidates proactively and providing necessary retention offers. This area has seen significant maturity over the last few years and is heavily leveraged in modern enterprises.

Another key area is the rapid evolution in the chatbot and IVR landscape. NLP improvements have provided more enhanced conversational capabilities to bots which are not evolving both in the messaging and voice landscape. AI's ability to scan through large amounts of data and learn from behaviors and patterns has helped companies implement these automation technologies at scale. While this area is still maturing alongside breakthrough advancements in AI, this space is significantly mature and is well utilized by most organizations.

4. AI Trends in Core Contact Center Technology

A key aspect of any contact center solution is the core underlying software stack. This is the TIER that handles the actual contacts and acts as the integration and routing layer to connect them with the support teams.

AI Use-cases in contact centers range from development enablers, analytics, optimization, automation and containment. Just like with the end customer interfaces, a key area is using AI to aid code development. This section talks through some key use-cases (refer fig 5).

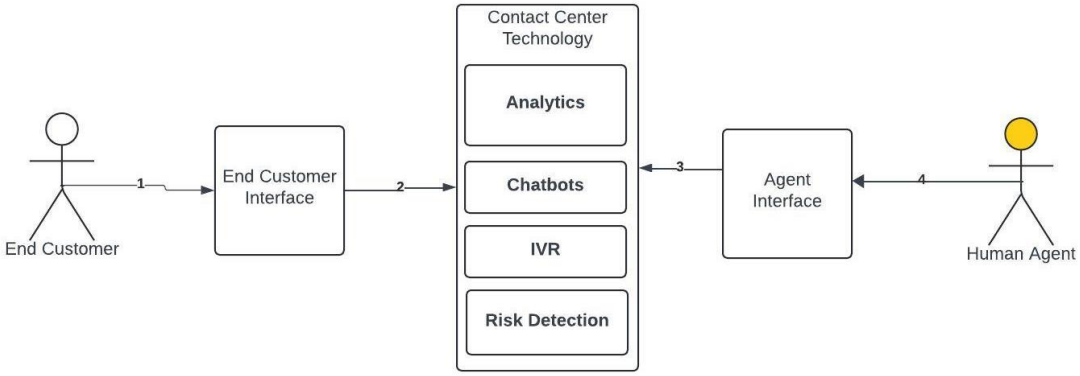

Fig. 5 Key AI use-cases in Contact Center Technology

Another significant area of growth is to use AI and ML Capabilities for analytics and quality assurance. These could range from analyzing for KPI(s) to forecast and optimize resources and staffing to identifying anomalies. A much talked about area is to feed voice or messaging transcripts to AI and analyze for sentiments and intents. These intents could then subsequently be used in analytics or in real-time by IVR and chatbots to augment and personalize the service provided. Such upfront analysis is also useful in optimizing Request routing and prioritization. AI is also used to detect anomalies, fraud and to minimize risk. Risk detection helps telecom organizations stay vigilant against fraud, corruption and compliance issues.

While using AI for virtual agent is one use-case which is often talked about, there is also the option of using these inferences to advise the customer support agents with context and suggested responses to better service the customer. Such use-cases help retain the human element of the transaction while still improving productivity and often impact customer satisfaction overall. A key use-case in this area is recommendation engines to advise agents on the next best action for the contact or letting AI handle labor heavy tasks like searching through documentation while letting the agent focus on personalizing the customer interaction. Another use-case often used by global companies is to use AI for real-time translation. Such AI integration helps businesses provide customer support globally in a cost optimized fashion.

5. AI Trends in Agent Interface

The agent interface enables the agent to communicate with the customer and makes available CRM/CSM Capabilities to be able to service the conversation. These may include capabilities across multiple products, services, customer types and workflows in a single tool or across multiple tools. AI is being applied across many CRM facets like automation, data analytics, and prediction-making. This section talks through some key use-cases (refer fig 6).

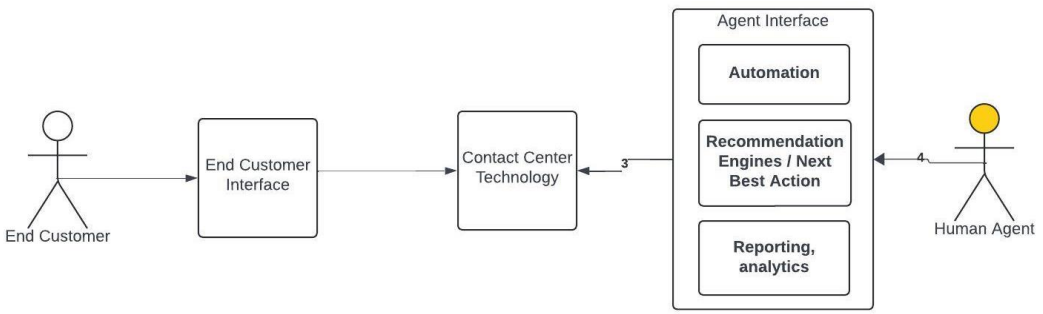

Fig. 6 Key AI use-cases in agent Interfaces

Like other areas, AI is often applied to improve productivity or to ensure quality during code development. AI tools are also being used to enable rapid prototyping and testing, accelerating the development cycle. The use-cases apply across multiple aspects of code development and different parts of the SDLC workflow. Even areas like design and testing are seeing significant growth. AI-driven insights are often used to create tailored designs that increase user satisfaction and engagement. It is important to talk about AI driven low-code no-code solutions where AI provided with specific parameters is used to automatically generate underlying code.

Another key area of AI is to increase automation. AI can enhance development life cycle by automating repetitive tasks while preserving the need for human creativity where needed. Automation could vary from synthetic client-side automation which recreates agent activity to headless API Automation which skips the user experience. The key role AI plays ranges from identifying areas of automation to actual generation of the underlying automation scripts. These automation technologies could help reduce costs but are often also used to minimize human error and fraud risks often associated with sensitive transactions and data.

Reporting and predictive analysis is another key area of opportunity being explored with CRM Development. AI Predictions could be used to fast-track issue resolution, optimize leads or sales or can be used for forecasting. A common area of opportunity is presenting these recommendations to agents in Realtime to assist with the contact. Integrating these recommendation systems and insights into the CRM can often target specific workflows like presenting sales or retention recommendations.

Another key area explored is to use AI for data management. The use-case here utilizes AI to automate data entry, cleansing, and enrichment to maintain accurate customer records. This can help companies collate data from different interfaces into a centralized repository to create a 360 view of the customer which could then be used as a driver for other AI use-cases.

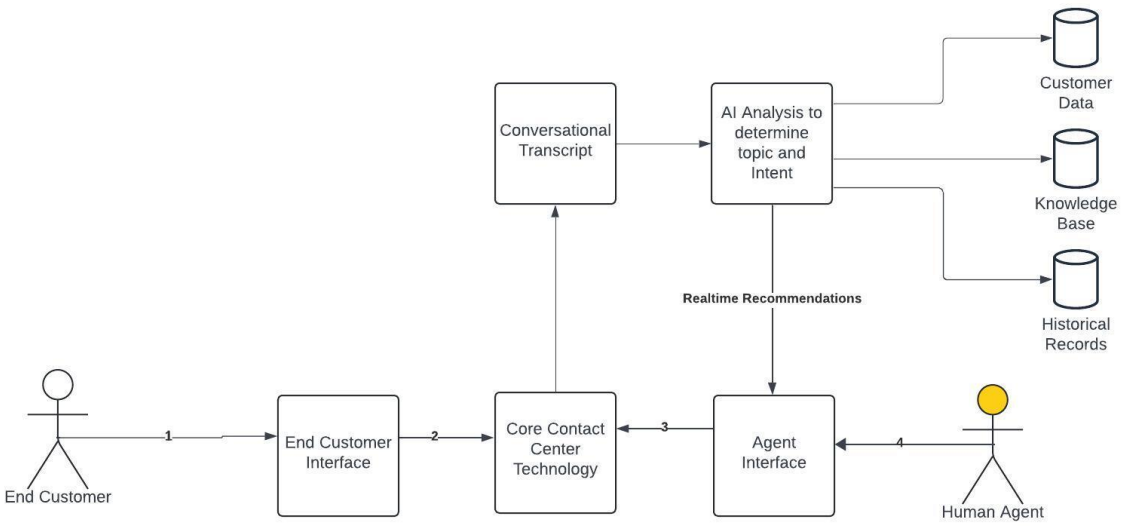

Fig. 7 AI Powered Recommendation Engine

Figure 7 highlights a common use-case being pursued by most CRM solutions where AI powers a recommendation engine which provides real-time insights and recommendations to assist the agent with the conversation. Such solutions retail the human element of customer support while still using AI for productivity and financial gains. In this scenario, there is real-time transcription of the conversation being fed into a recommendation engine. We discussed in earlier section how NLP advances help with transcription. The latest advancements have resulted in significantly improved results with low word error

rates which help improve the overall efficacy of such solutions. The AI engines are provided access to multiple data source apart from the real-time conversational transcripts, customers data as well as historical records as well as the knowledge base. The AI runs models which trained on thousands of prior conversations can accurately predict the conversation topics and intent and are then able to use this data to determine the best subsequent course of action. These actions could be derived from learning or manually configured depending on use-case. These recommendations are then returned to the agent in real-time to help them drive the conversation to a quick resolution.

6. Conclusion

AI is instrumental in building a modern contact center due to its ability to enhance various aspects of customer support. Technologies such as Natural language processing (NLP) and Machine learning. (ML), enable more efficient handling of the customer interaction by allowing organizations to build automation and personalization at scale. AI powered chatbots and IVR systems can resolve lot more queries without human intervention, reducing operational costs as well as improving response times, which helps with overall customer satisfaction. Lastly AI driven analytics provides valuable insights into customer behavior and preferences, allowing organizations to build more effective support strategies. Given such huge impacts AI is having across different areas of the contacts, it is imperative for Companies to stay informed and up to date with these innovations when building new solutions. By leveraging AI, telecom companies can significantly optimize their contact center operations, enhance overall customer satisfaction, and stay ahead of the competition.

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