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Challenges and Good Practices in Conversational AI-Driven Service Automation

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Completed Research Paper

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Abstract

Conversational AI offers novel opportunities for companies to automate customer interactions. However, many companies grapple with effectively implementing conversational AI. Utilizing an engaged, consortium-based research approach, we examine the unique challenges faced by six companies in the insurance and banking sector while implementing conversational AI solutions and identify best practices to address these challenges. Finally, drawing upon the lessons learned, we offer guidance for developing conversational AI capabilities and fostering conversational AI success stories.

Keywords: Conversational AI, Service Automation, Challenges, Good Practices

Introduction

This paper provides actionable recommendations to companies for implementing conversational AI solutions (e.g., chatbots, voicebots) more effectively. In recent years, unprecedented advancements in artificial intelligence (AI) have catapulted service-oriented industries, such as banking (McNamee 2022), travel (Daly 2018), and insurance (PYMNTS 2023), into a new era of technological innovation, wherein conversational AI is transforming the landscape of service automation. At the core of this transformative era, natural language processing and generative AI empower companies to elevate customer engagement, streamline internal operations, and boost overall efficiency (Huang et al. 2019; Iyer et al. 2016; McKinsey&Company 2023; Schanke et al. 2021). As an increasing number of companies recognize the immense potential of conversational AI, comprehending the challenges and best practices associated with its implementation emerges as an indispensable factor for driving widespread adoption and realizing real-world conversational AI success stories (Chandra Das et al. 2023).

For instance, Lemonade is an insurance company that leverages the capabilities of conversational AI to revolutionize the traditional insurance model, streamlining the customer experience and offering efficient communication. Lemonade enhances customer interactions and simplifies complex insurance processes by employing conversational AI as a central and dominating customer channel across touchpoints. To do so, it employs a software-based agent capable of participating in natural, human-like user dialogue. The agent is engineered to comprehend, interpret, and produce responses that closely mimic human communication, resulting in more organic and intuitive interactions compared to a traditional website (Lemonade 2023).

This elevates the user experience and promotes more effective communication between Lemonade and its customers. As a result, Lemonade can offer instant support, simplify the purchase of insurance policies, and settle claims rapidly, thus setting new standards for customer experience and efficiency in the insurance landscape (Broomfield 2021; Lemonade 2023). However, conversational AI is also disrupting other industries. For example, Emirates Vacation integrated a conversational AI solution within its display ads, boosting engagement rates by 87% during a 30-day test (Sorrelles 2018). Likewise, Madison Reed's Madi, a computer vision-enabled chatbot, increased engagement by 400% and achieved a 21% click-through rate (Rana 2021).

Despite such success stories, numerous large-scale conversational AI projects have either failed or encountered severe challenges during their initial stage. Thus, it becomes clear that successfully implementing conversational AI is not as easy as copying another company's strategy. For example, Microsoft launched Tay, an AI-driven chatbot, in March 2016, only to decommission it within 24 hours due to the system's dissemination of alarming political views instigated by user manipulation (Hunt 2016; Lee 2016). Another notable event involved Facebook's M assistant, launched in August 2015 and failing to adequately address approximately 70% of user inquiries (Simonite 2017; Sun 2017). Consequently, Facebook terminated the M assistant in January 2018 (BBC News 2018; Newton 2018). In addition, in February 2023, Bing, owned by Microsoft, which integrated Open AI's GPT4 in its search engine, experienced several glitches, causing Bing to propagate extreme views and suggesting to one user that he should end his marriage (Corfield 2023; Yerushalmy 2023). Thus, the primary challenges in implementing conversational AI consist of, among others, establishing a clear vision of how the company will utilize the conversational AI solution to add value, ensuring user acceptance, enforcing adequate security and compliance measures, and maintaining a team dedicated to the continuous improvement of the solution.

We follow an engaged scholarship approach to address these challenges and provide actionable recommendations to overcome them. We collaborated with a total of seven companies. Moreover, we engaged individually and collectively with these companies, the results of which are reported in this paper. We offer insights for researchers and practitioners by unraveling 11 implementation challenges for conversational AI solutions on four different layers. Additionally, we provide recommendations, best practices, and overarching guidelines for successful conversational AI implementations.

This paper is structured as follows: In Section 2, we provide in-depth background on the conversational AI phenomenon. In Section 3, we outline the method. Further, in Section 4, we present our results. Section 5 presents our overarching strategy to build conversational AI success stories. The paper concludes with Section 6.

Conversational AI

Conversational AI refers to technological artifacts that users interact with through natural language (McKinsey&Company 2020). They can be distinguished from other information technologies (IT) in several important ways.

- Conversational AI follows a novel interaction paradigm allowing companies to engage customers in increasingly personal ways, almost as if they were talking to a human service employee (Huang and Rust 2020).
- The dynamism inherent in conversational AI deviates from conventional IT due to its perpetual evolution and adaptation. This continuous metamorphosis underscores a unique aspect inherent to conversational AI and not present in most traditional IT (Anthony et al. 2023).
- Conversational AI often lacks visibility. This lack of visibility complicates observation and sense-making of its functioning, as users may remain oblivious to its presence (Anthony et al. 2023).
- The enigmatic nature of conversational AI renders it a "black box" for users and designers, regardless of their expertise. As these applications leverage intricate machine learning processes, deciphering their inner workings proves arduous, and comprehending the rationale behind specific conclusions remains elusive. Consequently, users may be compelled to unquestioningly trust the conversational AI solution (van Giffen and Ludwig 2023; Someh et al. 2022).
- Besides these tangible attributes, conversational AI has a symbolic meaning that transcends its material aspects. While other emerging technologies may hold symbolic importance, their value is generally

constrained to industries or contexts. In contrast, the discourse surrounding conversational AI permeates the entire economic landscape (Huang et al. 2019).

Conversational AI's unique features help companies improve user experiences via automation (Chandra Das et al. 2023). However, implementing novel technologies might cause dramatic disruptions to existing business structures, posing many questions to managers (Benbya et al. 2020). Companies undergoing such techno-change by embracing innovative IT experience considerable transformations in workforce dynamics, business processes, and performance outcomes. Techno-change represents the high-stakes and potentially lucrative situations that emerge from adopting cutting-edge technologies. These techno-change-triggering technologies contrast traditional IT applications, necessitating alternative methodologies for successful implementation (Markus 2004). Conversational AI is a prime example of a technology that can trigger techno-change, profoundly impacting a company's operations and interactions (Chandra Das et al. 2023). For instance, Capital One, a banking and financial services company, is an example of a conversational AI-driven business transformation. Integrating intelligent agents into their customer service operations allowed differentiation by surpassing traditional banking services, thus dramatically increasing customer satisfaction and loyalty. However, it also required modifying workforce dynamics and business processes (High 2016).

As argued above, techno-change-inducing IT, such as conversational AI, can lead to remarkable performance improvements but cause dramatic disruptions to extant business operations. As such, traditional IT management procedures must be revised to manage conversational AI and ensure such technologies' successful implementation. Therefore, relying solely on traditional project management guidelines, organizational change programs, or a combination of both is insufficient for effectively implementing conversational AI technologies. Instead, companies should adopt a comprehensive implementation strategy considering the short-term, mid-term, and long-term technological (e.g., ongoing development and training of the system), organizational (e.g., a rethinking of processes), and human factors (e.g., human resistance) in implementing conversational AI systems.

Method

Consistent with interpretive approaches in information systems research (Walsham 1995), our study scrutinized organizational engagement with conversational AI solutions via a pioneering, collaborative form of inter-organizational learning — a researcher-coordinated consortium. Rather than predicting or analyzing causal relationships, we focused on comprehending the learning process across multiple analytical dimensions and how the consortium methodology can expedite and enhance organizational learning to address challenges. Following Van de Ven's (2007) concept of engaged scholarship, we employed action research to obtain the in-depth insights necessary to accomplish this objective.

Action Research

Action research eschews statistically generalizable explanations or the prediction of relationships, instead aiming to promote shared understanding and learning between researchers and practitioners while adapting real-world situations based on genuine issues (Baskerville and Myers 2004; Susman and Evered 1978). Consequently, the primary objective of action research is to address organizational problems while offering a more comprehensive solution (Reason 2006). This approach integrates researchers' theoretical knowledge with practitioners' situational insights and has become an indispensable instrument in information systems research. One common approach is to thoroughly understand the issues and surroundings of practitioners in order to assist them in identifying and solving problems effectively (Young et al. 2016). Moreover, action research has proven effective in developing design principles (Kohler et al. 2011) and constructing theories (Meissonier and Houzé 2010).

In our investigation, we employed dialogical action research, wherein researchers and practitioners interact periodically in a setting distinct from the practitioners' organization (Mårtensson and Lee 2004). We also organized the consortium and established the guidelines for participation. Firstly, participating companies must have at least one representative in the action research team. Secondly, representatives must gain practical experience by implementing conversational AI in their organization, ensuring effective learning, and working closely with at least one action research team researcher. Thirdly, the experiences and learnings from these practical experiences are shared and consolidated in joint workshops. These

workshops serve as the consortium's foundation and exchange platform. During these workshops, we did not require companies to provide access to specific results from implementing conversational AI. However, we encouraged them to share their experiences and lessons. In this manner, the workshops functioned as a facilitative interaction medium for all parties involved. Furthermore, the workshop series contributed to developing and validating concepts, artifacts, and tools for the consortium and its members.

The Research Consortium, Project Timeline, and the Research Team

The research consortium we initiated in November 2022 comprised four companies. By June 2023, the consortium held its third consortium workshop. We plan to conduct eight one- or two-day workshops over approximately two years. The participating companies typically delegated at least one individual from the IT and the business unit. As a result, this composition facilitated the in-depth exploration of technical, organizational, and management topics during the workshops, ensuring a comprehensive understanding of conversational AI-related challenges. As part of the workshops, the four permanent consortium companies and changing guest companies held presentations to share their progress, good practices, and challenges in the context of conversational AI. The presentations stimulated discussions on, for example, companies' adaptation to shifting business environments and alignment strategies amid the rapidly increasing number of conversational AI projects. Moreover, every workshop we conducted included hands-on working sessions to facilitate organizational learning. Generally, the action research team comprised three researchers and 14 practitioners.

Data Collection and Analysis

Initially, we collected our first data by observing consortium workshop participants' discussions and presentations. In addition, we talked with the participants collectively and individually and recorded field notes to preserve crucial observations during the workshops. After the workshops, we analyzed supplementary materials, including the participating companies' PowerPoint presentations and industry reports, to enhance our understanding of the topics discussed. Also, we met after each workshop to examine the field notes and uncover common themes. Parallel to the workshops, we conducted semi-structured interviews to supplement and validate the data amassed during the consortium workshops and secondary material analysis. We engaged 14 consortium participants. Moreover, we interviewed six individuals from companies outside the consortium to increase the generalizability of our findings. All interviewees held leadership positions within their companies and were directly involved in implementing or developing conversational AI solutions. The interviews lasted approximately 60 minutes each and were recorded via Microsoft Teams. We conducted the interviews between March and April of 2023. The interviews were primarily explorative. For our analysis, we triangulated the findings from the interview study with our observations from the workshops.

To analyze our data, we conducted a thorough thematic analysis. All interviews were transcribed (i.e., via Whisper) and coded (i.e., via Atlas.ti) to systematically derive insights about challenges and solutions concerning the adaptation of conversational AI for service automation. We employed a multi-stage coding scheme in our analysis approach, inspired by Gioia et al. (2013). This approach enabled us to discern relationships between 1st order codes, 2nd order categories, and aggregate dimensions. Initially, we began with the interview transcripts, highlighting 1st order codes that encapsulated our informants' themes. Specifically, these pertained to the diverse practices employed by the case companies to navigate challenges in conversational AI adaptation for service automation. We then aligned the 1st order codes (i.e., solution practices) with 2nd order categories (i.e., associated challenges) based on content parallels and logical ties. This step yielded 18 1st-order codes and 11 2nd-order categories. In the subsequent phase, we revisited the 2nd order categories, probing for deeper connections and broader abstractions. This effort identified four aggregate dimensions: strategy, organization, solution, and infrastructure.

During the data analysis, we utilized several measures to ensure the rigor of our research process and the trustworthiness of our interpretations. First, three researchers collectively participated in the coding process. Second, we regularly discussed our preliminary results with the consortium and sought their feedback. Consequently, we modified and refined our codes to ensure clarity and reliability, continuing these iterations until a consensus among the research team was reached. Third, we included quotes from the interviewees to convey their experiences and opinions vividly and authentically.

The Case Companies

The consortium case companies comprise two major Swiss health insurers and two of Switzerland's most prominent retail banks. Although operating in different industries, all consortium case companies share a strong customer focus in their operations, primarily due to their roles as service providers. All four companies handle large numbers of customer inquiries through different customer channels such as phone, chat, or email. Furthermore, the case companies have different degrees of digital maturity – from companies just starting to experiment with conversational AI to companies that have been successfully running these systems for some time. The initial 14 interviews were conducted with representatives from these companies (see Table 1). Furthermore, five more interviews were conducted with two other prominent Swiss insurers and retail banks to determine whether our findings are unique to the four consortium case companies or can be more broadly generalized and applied. Additionally, we conducted one interview with a conversational AI solution provider to gain insight from someone who has accompanied numerous conversational AI implementations.

N	Code	Company	Industry	Position of the Interviewee
1.	A1	A	Retail Banking	Head of Customer Service Center Change Management
2.	A2	A	Retail Banking	Customer Service Center Divisional Head
3.	A3	A	Retail Banking	IT Enterprise Architect
4.	A4	A	Retail Banking	Head of Service Excellence
5.	B1	B	Retail Banking	Business Analyst
6.	B2	B	Retail Banking	Head of Business Operations
7.	B3	B	Retail Banking	Department Manager in the Customer Center
8.	B4	B	Retail Banking	Business Analyst
9.	C1	C	Health Insurance	Head of Digital Transformation
10.	C2	C	Health Insurance	Chief Information Officer
11.	D1	D	Health Insurance	Customer Experience Manager
12.	D2	D	Health Insurance	Chief Information Officer
13.	D3	D	Health Insurance	Department Process and Project Manager
14.	D4	D	Health Insurance	Regional Customer Support Manager
15.	E1	E	Retail Banking	Project Manager/Product Owner
16.	E2	E	Retail Banking	Head of Workforce Management
17.	E3	E	Retail Banking	Delivery Team Lead
18.	F1	F	Insurance	Software Developer
19.	F2	F	Insurance	Head of Conversation and Marketing Automation
20.	G1	G	Solution Provider	Country Manager
Table 1: Case Companies				

Conquering Conversational AI

Through our systematic examination, we categorized the identified challenges and solutions within four discrete layers: strategy, organization, solution, and infrastructure (see Table 2). Altogether, we pinpointed 11 challenges and 18 applicable solutions.

Strategy Layer	
Challenges	**Solutions**
Stakeholder Engagement	• Implement Trial & Error Strategy • Start Change Management • Foster Business Sponsorship
Vision & Use Case	• Craft AI-Driven Customer Vision & Strategy • Envision Omnichannel Roadmap

Organization Layer	
Challenges	**Solutions**
Process Reboot	• Prioritize Customer Channels • Envision Business Process Redesign
Augmenting Customer Service	• Strive for Empowerment • Reimagine Metrics
Conversational AI Ops Mastery	• Build Dedicated Conversational AI Team • Streamline Delivery & Deployment
Solution Layer	
Challenges	**Solutions**
User Acceptance	• Nudge Customers • Establish Design Prowess
Conversational AI Clarity	• Utilize Advanced Sensing-Making
User Vulnerability	• Set Up Trustworthy AI Guideline
Infrastructure Layer	
Challenges	**Solutions**
Provider Selection	• Develop Providers
Security & Compliance	• Draft Secure & Comply Framework
IT Architecture	• Deploy Flexible APIs
Table 2: Challenges and Solutions	

Strategy Layer

We identified the two critical challenges on the strategy layer – stakeholder engagement and vision & use case – that deal with the company's strategic considerations when implementing conversational AI solutions.

Stakeholder Engagement

Navigating stakeholder engagement in conversational AI projects presents multiple obstacles. First, when investing in conversational AI, there is a significant disparity between short-term investment requirements and long-term value capture potential. In contrast to most IT endeavors, conversational AI necessitates a substantial initial investment to unleash lasting value for the company and its customers, which can deter stakeholders from allocating the necessary resources.

> *"In general, I think one should definitely allocate more funds compared to other projects. The idea is that, while it is possible to start small, there is a risk that underinvesting from the beginning could hinder the ability to generate a good impression with the customer." – INT B1*

Second, there is a wide-ranging spectrum of stakeholder expectations, from excessive optimism to utter skepticism regarding conversational AI. Thus, even within the same company, there can be a great divide between stakeholders who overestimate or underestimate conversational AI's potential.

> *"Why is there still such a big gap between, for example, Bank A and Bank B? Why does Bank A say this is such a cool thing? We really need this, and Bank B resists it with all its might. Or even within a company, like, for example, the Innovation Team, they want this, but other departments are completely against it. For me, this is still a bit of a mystery; where do these extreme contrasts come from? I cannot answer that." – INT G1*

Third, a deficiency in top management-level understanding obstructs companies from objectively assessing conversational AI's potential for their company, culminating in overlooked opportunities. Fourth, organizational resistance may arise when initiating a conversational AI project. One potential catalyst for such opposition is middle managers, which frequently derive their stature from the number of employees

they supervise. Consequently, they are particularly susceptible to sparking organizational resistance when their company endeavors to employ conversational AI for service automation, as fewer employees are needed, leading to a decline in their perceived status.

> *"The obstacle is primarily in middle management. The main issue is the resistance within middle management by individuals who determine their worth based on the number of employees they oversee." – INT C1*

Implement Trial & Error Strategy. Companies should adopt a trial-and-error strategy when implementing conversational AI to ensure sustained stakeholder engagement. Moreover, companies should focus on exploration and learning without immediate pressure regarding results. This approach enables companies to acquire the necessary skills and knowledge to become conversational AI literate.

> *"We are a bank. We understand the banking business and the entire customer service at our customer service center. What we do not understand at this point are chatbots, and that is why the expectation was actually that we would take a look at it ourselves. Out of the box, we examine it and thus create an understanding of the whole topic within our company. [...] This is a special approach, but ultimately a very efficient one and one that has brought me joy." – INT A1*

Concurrently, companies should develop an initial prototype to demonstrate the value of the conversational AI solution. Especially when the top management often lacks the necessary knowledge to evaluate the real potential of conversational AI effectively, it is apparent to showcase the prototype's capabilities.

> *"Exactly, we need to convince the management. I have found a good way to do this by showing working prototypes and encouraging them to try it out themselves. A year ago, the mindset was a bit different. As I said, I get the management on board with working prototypes. When they try them out, they are often excited." – INT C1*

With a successful prototype developed, it is time to shift the attention to the grander scheme and consider the potential for widespread implementation.

Start Change Management. Companies should clarify the distinction between conversational AI projects and traditional IT projects to the top management and relevant stakeholders to implement conversational AI solutions effectively and initiate the needed change management process. This distinction lies in the evolutionary character of a conversational AI project which cannot be handled by just following a waterfall approach. Hence, a more agile approach must accommodate and address these differences.

> *"With a CRM system or in a traditional IT project, you can still achieve your goal quite well with the waterfall model. With AI, you have no idea what will happen next month. [...] That is why we do it agilely. Step by step. And as safe as possible, but with AI, you have a degree of uncertainty, which means it is never 100% safe, yes, never 100% safe. And the quality is never 100%." – INT B2*

This clarifying communication fosters awareness that a new and novel approach to implementing and managing conversational AI solutions is necessary. Moreover, effective communication with affected employees and stakeholders is crucial to tackling organizational resistance at its roots. For instance, case company B established specialized groups and technology ambassadors to facilitate more effective communication around conversational AI. This approach enabled a more egalitarian exchange of ideas and perspectives.

> *"The employees who work in these groups or as ambassadors are more motivated; they understand the background better. They understand the purpose better and carry their motivation to places where it might be a bit more difficult to motivate. If I, as a department head, do something through two levels or [person's name] through three levels, it is naturally less credible than when employees directly share the topic with others based on their feelings or experiences." – INT B3*

Moreover, involving employees in the development process can mitigate organizational resistance and alleviate the anxiety associated with potential job loss. One practical approach is to host hackathons.

> *"Classic measures like hackathons are used later when employees are involved. It is important to include them in order to create acceptance." – INT C1*

Lastly, it is vital to keep the top management and stakeholders informed throughout the project's lifetime to mirror conversational AI's evolutionary nature. This approach also makes the difference between traditional IT and conversational AI projects more tangible for less tech-savvy stakeholders.

Foster Business Sponsorship. First, the dedicated sponsor must secure top-management buy-in to ensure lasting commitment. Without a secured commitment from the top management, the project will likely drop in priority, causing it to be unable to accomplish its goals fully.

> *"This is discussed monthly with the management, and due to the reputational risk, the topic is important. And we have enough management support and pressure to ensure we do it right. That means we have the right setup: we do this step by step with management attention, and that is the right approach for me." – INT B2*

Additionally, the sponsor assumes responsibility and accountability for the conversational AI project and acts as a bridge and mediator between the top management and the conversational AI team.

Vision & Use Case

One of the main obstacles in adopting conversational AI is formulating a coherent vision for the future of customer interactions. Specifically, companies must tackle the formidable challenge of devising a structured and strategic approach to identify value-adding, adaptable, and scalable conversational AI use cases.

> *"Then the response came: "You know, our management approves everything." Everything that comes in as project proposals is simply waved through. [...] I only had to fill out a document, but I think I could have written in Gummi Bears Gang or something else; I believe it would not have mattered." – INT D1*

Craft AI-Driven Customer Vision & Strategy. Companies aspiring to become conversational should devise a comprehensive conversational AI strategy. This process involves outlining a vision for future customer interactions and conversational AI's role within the company. Furthermore, given the utilization of a novel technology (i.e., conversational AI), businesses must reimagine their customer strategy to maximize the potential of this technology. However, the conversational AI strategy must align with the company's overarching customer strategy and culture. As seen by the example of case company D, the overarching customer strategy is to talk with the customer personally, making it challenging to create a fit with conversational AI solutions.

> *"We actually want to be on the phone with the customer all the time. There is a principle with us: verbal communication before written. When I read and heard that, I threw my hands up in disbelief. Our approach is to talk to customers on the phone, explain things, and really get into relationship management." – INT D1*

However, synchronizing conversational AI with the customer strategy and company culture proves vital for the solution's long-term success, as a misalignment may result in diminished management attention toward the conversational AI solution, culminating in underutilization. Extending this line of reasoning, it is imperative to transition from a cost-centric paradigm to a value-centric one. Particularly within the realm of customer contact centers, conversational AI liberates agents from low value-adding and highly repetitive tasks. As a result, customer contact center agents may face more complex customer inquiries. These inquiries may take longer to resolve but can provide significant value for the company and the customer.

> *"Since we are under pressure to meet quantitative targets in the customer contact center, we are forced to keep our calls as short as possible, fulfill the customer's request, and end the conversation to attend to the next customer. However, this means that we cannot use these 2 million customer contacts per year for cross-selling and up-selling." – INT A1*

Envision Omnichannel Roadmap. When companies strive to utilize conversational AI across various customer channels, they should ensure a seamless transition between channels without requiring customers to restart their customer journey. Moreover, businesses can foster more personalized interactions that resonate deeply with their customers by harnessing customer data. As a prerequisite, companies must establish and understand their conversational AI omnichannel core mission, prioritize customer needs, and integrate conversational AI not merely out of a fascination with the technology. Hence, in optimal settings, conversational AI evolves beyond a tool, architecting customer journeys.

Organization Layer

We discovered three critical challenges on the organization layer – process reboot, augmenting customer service, and conversational AI Ops mastery – that deal with internal company dynamics when implementing conversational AI solutions.

Process Reboot

Conversational AI represents a novel customer channel that dramatically impacts business operations. Specifically, implementing this new customer channel requires a new interaction logic and orchestration with existing channels. For instance, the unique features of conversational interaction, such as high synchronicity and low revisability, require a reimagination of what and how to communicate with the customer. Moreover, companies must contemplate the strategic orchestration of their customer channels to avoid inadvertent cannibalization, which could ultimately lead to a detrimental cost-value imbalance.

Prioritize Customer Channels. It became apparent that prioritizing customer channels along a two-step approach was critical to orchestration. First, companies must create a clear hierarchy of priorities for customer engagements. Then, if they decide to transition customers from traditional communication channels to AI-driven conversational solutions, they can consider phasing out older channels strategically.

> *"This included, among other things, the shutdown of various channels. We used to have the fax channel and contact forms, which we gradually dismantled." – INT E2*

Second, companies should strategically deploy conversational AI solutions in places where customers are most likely to embrace them. As such, placing a specialized conversational AI solution on the company's main webpage may not be the best approach if the problem it addresses occurs elsewhere. Moreover, when companies want to position their conversational AI solution on their main webpage, they can utilize them to enhance website navigation by sharing deep links with customers, enabling customers to access self-services more effortlessly. In this manner, conversational AI facilitates more straightforward navigation on convoluted websites with multiple layers and allows companies to improve the user experience without extensive reprogramming of their webpage.

> *"Currently, we are pursuing a steering strategy in which we take a step back in the concrete implementation of use cases. If functionality is available in online banking and the app, we do not want to implement the case 1:1 in the bots but rather guide the customer to the correct channel with the bot and help them to independently handle it in the app or online banking. This works well in the written area." – INT E2*

Envision Business Process Redesign. Companies should begin by assessing a process's suitability for conversational AI. They can do this by examining occurrence frequency, possible value gains, automation feasibility, execution time, and integration complexity. Before implementing a conversational AI solution, it is essential to determine its exact role: Does it merely guide customers to an appropriate self-service starting point, or does it act as the primary interaction medium, delivering services from start to finish? Further, companies must determine whether a rule-based bot suits their use case or if a conversational AI is genuinely required and meets all the essential security and compliance standards. Companies should also consider adapting their processes to be more flexible. This adaptability allows the smooth integration of existing channels with conversational AI. As a result, if the conversational AI encounters challenges in addressing a customer's needs, a human agent can seamlessly intervene.

Comprehensive processes are needed if the goal is a fully integrated conversational AI solution. These processes should span multiple business units, ensuring the AI solution has access to all the information it requires to respond effectively to customer inquiries. Such a holistic approach heightens customer satisfaction by enabling conversational AI to address concerns more precisely, flexibly, and holistically. Lastly, companies should not just replicate traditional conversational structures. Instead, companies should expand their strategy by embracing avenues like texting, voice communication, visual aids, document sharing, co-browsing, and biometric e-signing, all facilitated through conversational AI.

Augmenting Customer Service

As conversational AI is employed, the roles and responsibilities of customer contact center employees transform. The emphasis transitions from offering support and handling customer inquiries to generating more tangible value for the company (e.g., through cross-selling and up-selling). Furthermore, the adoption of conversational AI results in heightened task complexity. As the AI solution is integrated, customer contact center employees assume the human element in a hybrid process, overseeing the AI system and resolving potential issues when the conversational AI encounters obstacles while assisting customers.

Strive for Empowerment. Customer contact center employees should be trained to manage their evolving roles and responsibilities effectively. This can be achieved by providing upskilling programs. This trend was already evident at company E, where the conversational AI solution automatically addressed many customer inquiries. As a result, the focus of customer contact center employees shifted from resolving issues to providing advice. Therefore, company E offered its employees the opportunity to participate in training programs and transition into advisory roles, concentrating on specific product groups in which they could become experts.

> *"In addition, the role of employees has changed due to the new skill model. The training is shorter and modular, and employees can decide for themselves which modules they want to complete. This allows for individual development. In the past, there were strict separations between private and business customers; today, customer advisors are hired neutrally and can develop in various directions after their initial training." – INT E2*

Another approach involves reskilling, wherein companies re-train employees to take on new tasks or fill emerging hybrid roles that stem from adopting conversational AI. One such hybrid role entails overseeing the AI solution and offering second-level support when human intervention becomes essential. These hybrid roles serve as a bridge between conversational AI solutions and human expertise, harnessing the strengths of both to enhance customer interactions and ensure seamless resolution of complex issues.

Reimagine Metrics. Conversational AI allows customer contact center employees to focus on handling fewer yet more complex calls, freeing them from highly standardized and repetitive tasks. Consequently, traditional employee-focused productivity key performance indicators (KPI) like average handling time (AHT) may no longer be appropriate. Furthermore, they do not accurately represent the new hybrid work situation resulting from automating frequent inquiries. Thus, the question arises of how to measure the productivity of this newly emerging AI-human-ensembles.

> *"We decided some time ago not to set the average handling time (AHT) as a KPI for our employees. The AHT increases yearly, not only due to artificial intelligence but also general digital developments. [...] Year after year, simpler tasks are automated, and the long conversations remain with our customer advisors." – INT E2*

A solution is to focus on softer goals like customer satisfaction rather than rigid metrics like AHT. Additionally, as new tasks emerge, companies need to develop suitable KPIs. For example, companies can employ KPIs such as leads per month generated if the newly available time is used for lead generation.

Conversational AI Ops Mastery

The incorporation of AI-powered conversational solutions introduces unique complexities for those solutions operations management. Firstly, the dynamic process of implementing conversational AI differs from traditional IT projects, as these initiatives require ongoing attention. Consequently, they do not possess a definitive endpoint since conversational AI necessitates continuous updates to identify new intents or address emerging customer inquiries. Moreover, the probabilistic nature of Conversational AI introduces new complexities for companies. These systems generate responses based on patterns learned from extensive training data, rather than using a fixed set of responses.

> *"Currently, we are at 95% [intent recognition]. We have set a goal of 95% to increase from 85% to 95% [...]. Since the beginning of April, we have achieved this 95%." – INT B4*

Thirdly, the rapid pace of technological advancement that companies must navigate when adopting emerging technologies like conversational AI. These technologies often have fast innovation cycles, leading companies to feel as if they have invested in an outdated solution upon implementation.

Build Dedicated Conversational AI Team. A cross-functional team brings all the necessary skills for successfully implementing a conversational AI solution. Furthermore, the cross-functional team should include dedicated members who act as a delivery group for the conversational AI solution, preferably consisting of professionals like software engineers and enterprise architects. The group should also incorporate a data science team experienced in working with AI tools, as data scientists play a crucial role in refining and training conversational AI models, ensuring accurate and meaningful interactions with customers. Notably, the involvement of data scientists distinguishes conversational AI implementations from traditional IT implementations. Moreover, the team must designate a dedicated product owner to ensure cohesive management and continuous improvement of the conversational AI solution.

Additionally, the cross-functional team can act as a liaison between the different company departments connected to the conversational AI solution. This team should include the following functions. First, when a department already has a well-established approach to application programming interface (API) management, it is highly advisable to integrate a representative from that department into the cross-functional team. This person can facilitate knowledge transfer and act as a mediator to manage the connection between the solution and their department's API management approach.

> *"But most of the time, the interface is not the problem; rather, it is the coordination on accessing or building the interface. That is usually what takes time. And that is true; another team might have, for example, the same interface. Then you do not start over discussing the architecture from scratch." – INT E3*

Streamline Delivery & Deployment. Companies are advised to implement a conversational AI operations management strategy emphasizing continuous learning and adaptation of conversational AI solutions. This strategy can be achieved by adhering to agile development principles and methodologies. Furthermore, due to the continuous evolution of conversational AI solutions, an agile management approach is more fitting than a traditional waterfall method.

> *"It is actually a three-step process that resembles the SAFe model [Scaled Agile Framework]. Within the team, agile development takes place, and decision-making usually occurs at the highest level." – INT E3*

Specifically, companies should cultivate a culture of interactive and iterative improvement processes, accommodating the evolutionary nature of conversational AI. Thus, after implementing the conversational AI solution, the company must keep developing and optimizing it instead of halting its development. Also, it is crucial to involve internal end-users, ensuring the conversational AI functions as intended. One way to accomplish this is by, for example, allowing customer contact center staff to give feedback on the call routing decisions made by the conversational AI. This approach was implemented successfully in one of our case companies. Moreover, by involving customer contact center employees in improving the AI system, these employees moved from simply being AI system users to active co-producers, adopting the role of conversational AI "prosumers" (i.e., consumers and producers).

> *"Additionally, we collaborated with the customer contact center. They have set up a complete page where they register if they feel a call has been misrouted. They enter parameters such as the call number and processing time. Then, we can find the corresponding call in the system and check what was effectively said and update the system to make it work better." – INT B4*

Furthermore, companies should adopt event-based and automated re-training of models, maintain a continuous and scheduled delivery and deployment pipeline to keep the solution up-to-date and adapt product thinking to accommodate the ongoing evolution of conversational AI. To effectively train conversational AI, it is essential to have a budget that allows for continuous development. Also, it is important to standardize the data collection process for re-training conversational AI models. In addition, companies should create a varied and multilingual dataset to improve user intent recognition. However, starting with a few intents is best to avoid overfitting, as demonstrated by case company E.

> *"For example, we had technical problems with intent recognition and the model. We received incorrect advice on how to train the bot. We now have to start over and train the bot again, perhaps using the insights we have gained. For instance, we trained too many intents […]" – INT E3*

A content creation team should be in place to adapt the conversational AI as new scenarios or product offerings emerge, ensuring that the AI system remains relevant and up-to-date. However, the company

must also proactively adapt and evolve in response to conversational AI advancements. This mutual adaptation will facilitate a more effective and efficient integration of the conversational AI solution within the company's operations and overall strategy.

Finally, to adapt to the evolutionary nature of conversational AI, employees should be encouraged to reflect on the solutions and contemplate future improvements that generate value for both the company and its customers. By fostering a culture of continuous learning and adaptation, companies can ensure that their conversational AI solutions remain relevant and effective in addressing the ever-changing needs of their customers and the business landscape.

> *"You should set aside half a day per week to experiment with new ideas and technologies. In most cases, this might not lead to any results, but occasionally, very helpful outcomes are achieved. This needs to be encouraged; otherwise, you will only be a laggard in the market." – INT C1*

Solution Layer

We identified the three critical challenges on the solution layer – user acceptance, conversational AI clarity, and user vulnerability – that deal with the company's solution-oriented considerations when implementing conversational AI solutions.

User Acceptance

For example, the resistance on the user side, which was observed at case company E, should not be underestimated. In this instance, users occasionally expressed frustration with the conversational AI solution by demanding to speak with a live agent instead of the conversational AI solution.

> *"I believe what you notice the most is that older people tend to feel overwhelmed by it [the conversational AI solution], and then they say something like, "Just connect me." Yes, it is an adjustment for them." – INT E3*

Moreover, companies often lack customer experience (CX) and user experience (UX) teams. This gap hinders companies' ability to foster user acceptance effectively.

Nudge Customers. Nudging the customer to use the conversational AI solution can be achieved by phasing out alternative communication channels, introducing fees for utilizing traditional channels, or reallocating resources from established channels, which may result in longer wait times. By doing so, companies can strategically guide customers toward adopting conversational AI solutions for their service needs.

Establish Design Prowess. Companies should foster design proficiency by establishing dedicated User Experience (UX) and Customer Experience (CX) teams. The UX team focuses on refining the conversational logic, personality, and accessibility of the conversational AI solution. In contrast, the CX team contemplates the broader customer journey and the overall experience with the brand and company, including the chatbot's role in that journey. However, it is not only vital to create dedicated CX and UX teams, but it is also essential to actively incorporate them into the conversational AI project.

> *"We were not involved in this project [conversational AI project] at all when it was set up. I had to completely reorganize and restructure the entire CX management last year, but in the past, my predecessors and the team did not collaborate on this topic. They were not involved whatsoever." – INT D1*

Conversational AI Clarity

As companies utilize conversational AI, they reduce direct customer contact, resulting in less clarity regarding what happens between the customer and the AI solution. This opacity in communication can negatively impact the customer experience, particularly when the conversational AI fails to operate as designed, culminating in discontented customers and unresolved inquiries.

Utilize Advanced Sense-Making. Developing new sense-making measures that address potential issues stemming from interactions with a conversational AI solution is prudent. Advanced sense-making techniques for conversational AI encompass the precision of customer authentication, the likelihood of

accurately discerning the customer's intent, and the sentiment displayed during the customer-AI interaction. Furthermore, it is crucial to maintain constant vigilance over customer interactions with the conversational AI solution. A potential approach could involve using a dashboard that facilitates human intervention in instances where the AI cannot provide satisfactory customer outcomes.

User Vulnerability

Privacy concerns arise with conversational AI as it increasingly analyzes and stores customer data. In addition, the often human-like nature of conversational AI poses the risk of customers being more susceptible to manipulation. Furthermore, ethical issues emerge due to potential discrimination, where specific customers may inadvertently experience discriminatory treatment based on the conversational AI's underlying algorithms and training data.

Set Up Trustworthy AI Guideline. Companies must create guidelines for trustworthy AI. This, for example, includes that the conversational AI solution communicates to customers that they are interacting with a machine, not a human. Moreover, it is essential to empower customers with control during their engagement with the conversational AI solution, preventing any exploitation of the conversation's nature. Additionally, businesses must stay alert to potential biases they may inadvertently introduce and consistently monitor for such occurrences.

> *"We do not make automated decisions for customers. Everything is done by humans, and thus we have no risk. Because it is simply not allowed in Europe, there are no banks that do this in Europe. And then, it is set up so that an automated decision is made. If it is "yes," it goes through. If it is "no," there is a person who reviews it again and physically clicks. We are not there yet; we do not have an AI that makes professional decisions." – INT B2*

Equally important is the development of guidelines for managing conversational data, given the sensitive nature of the information collected. Lastly, companies must remain conscious of and identify possible conflicts of interest.

Infrastructure Layer

We pinpointed the three critical challenges on the infrastructure layer – provider selection, security and compliance, and IT architecture – that address a company's infrastructural considerations when implementing conversational AI solutions.

Provider Selection

Many enterprises refrain from developing conversational AI solutions independently, leading to the critical task of selecting an appropriate provider. However, many enterprises unfamiliar with conversational AI struggle to identify suitable vendors due to their lack of experience and the rapidly increasing number of new players in the market. As a result, companies are often ill-equipped to anticipate future challenges and uncertainties associated with their chosen provider, which can lead to negative long-term consequences. Therefore, companies must systematically evaluate vendors based on predefined criteria and consult with other firms to gain further insights.

> *"It [conversational AI project] is difficult to assess, as there are no good references available. Information could be obtained from previous employers or other employees, but for most, it is something new. As a result, we are in a weaker position because we are truly dependent on the supplier. [...] This is different from other projects, such as a CRM expansion. In these conversational AI projects, we lack both the references and the expertise from previous projects to truly evaluate them." – INT B2*

Develop Providers. The conversational AI vendor landscape is vast, diverse, and continually evolving. Companies looking to utilize these solutions must carefully evaluate several critical aspects of potential vendors before entering into contractual agreements. Firstly, assessing a vendor's longevity in the conversational AI market, feature offerings, lock-in risks, and integration capabilities are essential to ensure scalability, compatibility, and long-term value creation. Equally crucial is the flexibility in deployment options vendors offer, whether cloud-based, on-premises, or hybrid. Furthermore, indicators of smooth integration include comprehensive software development kits and precise documentation. Asking vendors

for case studies can provide valuable insights into their reliability and track record in the industry. Moreover, open and transparent communication and regular reviews are essential to keep both parties aligned, ensuring the delivery of innovative and effective solutions. In addition, understanding a vendor's data privacy practices is paramount to safeguarding company and customer data.

> *"The change [change of the solution provider] was necessary because, in the past, we were not allowed to implement cloud-based customer data solutions. [...] And of course, there is a bit of a learning experience for me: thinking ahead and bigger, not just answering a few general questions, but also considering what happens when we are eventually allowed to work with customer data. Is it still the right provider? What about the interfaces that we need? And even if we start small. Changing providers naturally involves a lot of effort." – INT E2*

On the other hand, when utilizing language models like OpenAI's GPT-4, companies must consider how often and extensively they are updated compared to competitors' language models (e.g., Google's PaLM 2) and whether they offer robust APIs. It is also essential to explore the fine-tuning possibilities and ascertain if the provider or the company possesses the data for such customization. These factors are crucial for maintaining a state-of-the-art solution. Additionally, understanding the privacy practices of these providers is essential to offer solutions that comply with regulatory security and compliance standards.

Security & Compliance

Implementing conversational AI presents several distinct challenges to IT security and compliance. First, the interaction with conversational AI generates susceptible customer data, such as voice recordings. Since this data is crucial for identifying customer needs and characteristics, it is vital to ensure that it is used only for its intended purpose. Second, firms must carefully contemplate deploying their solution on-premise or in the cloud. While cloud deployment offers performance benefits, adhering to data protection policies is crucial.

> *"If we are allowed to use cloud solutions, we would make significant progress, especially for High German. Swiss German is not automatically supported by providers like Google Cloud. One of the biggest obstacles is that we are actually not allowed to use cloud services, and this depends on data protection decisions." – INT E3*

Draft Secure & Comply Framework. It is prudent for companies to establish a robust security and compliance framework tailored to their conversational AI needs. This framework is a bedrock, ensuring consistent and informed decision-making regarding security and compliance concerns. At first, seeking help from outside service providers may be necessary to create a framework. However, it is vital for long-term success to develop the ability to do this in-house. A central consideration this framework should address is the company's capacity to meet security and compliance requirements. If deemed insufficient, the framework may advocate for the engagement of professional service providers to shoulder specific responsibilities, thereby bolstering the company's overall security and compliance posture.

> *"The security requirements that would be directed at us if we were to operate everything on-prem ourselves are something we could no longer fulfill. [...] This means that we need specialized service providers to enable us to securely operate our applications. Today, it is safe when you place it in a secure cloud environment to meet the requirements at all." – INT F2*

IT Architecture

Given that a company's IT architecture predominantly evolves organically, the inherent complexity poses challenges in seamlessly integrating new systems. This issue is further exacerbated with conversational AI, which necessitates access to diverse data types, often stored in different locations, to respond to customer inquiries effectively.

Deploy Flexible APIs. It is crucial to utilize flexible APIs to mitigate challenges posed by the complex and varied IT architecture prevalent in many companies. Additionally, it is advisable to reuse APIs whenever feasible by collaborating with the responsible department overseeing the required API, thereby avoiding the creation of extraneous APIs and preventing further architecture complications.

> *"Yes, of course, I would introduce more flexible interfaces, as I believe currently, we do not even have versioned interfaces, and that would make things a lot easier." – INT E3*

Furthermore, it is prudent to minimize incorporating business logic within the APIs to maintain API flexibility and ensure adaptability, reusability, and scalability.

Roadmap for Becoming a Conversational Company

Drawing on insights from our consortium, we have identified various challenges and potential remedies for implementing conversational AI solutions more effectively. Additionally, we provide three key recommendations tailored to specific development stages. (see Table 3).

Challenge/Strategy	Start Small & Learn	Assemble an Elite CAI Organization	Embrace a Long-Term Mindset
Stakeholder Engagement	X		X
Vision & Use Case	X		X
Process Reboot	X	X	
Augmenting Customer Service			X
Conversational AI Ops Mastery		X	X
User Acceptance		X	
Conversational AI Clarity		X	
User Vulnerability		X	
Provider Selection			X
Security & Compliance		X	X
IT Architecture		X	X
Table 3: Challenge-Strategy-Roadmap			

1. Start Small and Learn. In the first stage, a typical company starts with a small project team to facilitate organizational learning and experimentation with simple conversational AI use cases. For example, company C's Head of Digital Transformation assembled a small team to build conversational AI prototypes that were utilized as proof of value to secure top management support. He also showcased the prototypes to various employees and strategically involved them to mitigate organizational resistance.

2. Assemble an Elite Conversational AI Organization. A typical company establishes a dedicated conversational AI team in the second stage. Moreover, successfully transitioning into the second stage involves building a robust foundation for future use case implementations. Company B initiated its broader conversational AI journey with a voice authentication use case, establishing a robust foundation. Furthermore, this foundation led to the creation of various APIs that were subsequently reused for other conversational AI use cases. Thus, the conversational AI team could leverage this foundation to design and implement use cases swiftly, lessening IT department dependencies.

3. Embrace a Long-Term Mindset. In the third stage, a typical company reaches a critical juncture, necessitating a shift in mindset and organizational configuration. While many companies initially invest in conversational AI for efficiency reasons and to demonstrate its value, it is now crucial to transition from a cost-centric to a value-centric perspective to future-proof the investment. For example, case company E upskilled customer service employees to align employees with their new roles as product advisors, thereby maximizing the impact of the human-AI ensemble. We saw that the companies that got the most value from their conversational AI solution aimed for company-wide alignment, investments, and integration.

Final Remarks

This paper explores challenges and good practices in the context of conversational AI for service automation. Also, we derived actionable recommendations for companies that aim to become conversational. However, as with every paper, this also has limitations. First, our insights are relevant to companies that run large customer service operations (e.g., banks, insurers, retail organizations, and mobility providers). Second, our findings are relevant to organizations of different degrees of digital maturity. Third, our findings are relevant to regional contexts similar to Switzerland regarding digital

readiness. Switzerland is a country of high digital competitiveness, providing a mature digital infrastructure and abundant digital talent. Still, we recognize the potential limitation in capturing all regional differences and unique challenges other industries face. Especially, future research should broaden the scope to different industries, specifically B2B-industries that afford far smaller contact volumes.

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