Artificial Intelligence in Customer Management Processes: a Design Perspective

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Abstract. The use of Artificial Intelligence (AI) among companies is expected to be pervasive in the next few years in order to support decision making, increase productivity and efficiency and define User-Centred experiences for both customers and employees. This scenario is affecting the context of Customer Management Processes, such as marketing, sales and after sales activities including front line and back office tasks where companies are experiencing an increase of volumes of available data and an unexpected amount of multichannel interactions. This caused the need to invest in AI-based solutions such as Virtual Assistants, Chatbots and Vocalbots, Robotic Process Automation and analytics tools. In early 2021, the CMMC Club (Customer Management Multimedia Competence Club, born in 1997 at the scope to promote the benchmarking of performance and experiences among Companies with the mission to improve the relationship with their Customers through multimedia channels) and BSD (Italian company focused on research and Interaction Design) launched a survey on AI in Customer Management Processes. The goal was to understand how AI is used to create value in Customer Management processes, exploring the current and future trends and the most relevant issues in AI adoption. Results showed that companies are focusing not only on technological issues but also on the relationship between human beings and organizations, facing interaction design issues and User Experience topics.

Keywords: Customer Management, Artificial Intelligence, User-Centered Design.

1. Introduction

According to McKinsey "Global Survey on Artificial Intelligence", organizations are using AI solutions to increase value [1]. According to the survey, this could lead to an "AI divide" between companies that are already in an advanced phase of adoption and production and the players that are not even ready for gathering value from AI. In both cases, "AI Leaders" and "AI Followers" still have a "long way to go". Additionally, more than a half of respondents said that they applied AI solutions at least in

one function and the functional areas particularly involved in AI programs are Product-Service Operations, Marketing and Sales.

The measurement of value in Customer Management Processes can be managed through specific KPIs, such as revenue increase, costs reduction, Lead Management results, quality and satisfaction, churn prevention, Customer Effort Score and Net Promoter Score. Customer Management Processes include front line and back office tasks and are producing and processing millions of multichannel digital data and interactions, which foster AI solutions essential for optimizing performances and services. CCW Report "AI Trends Affecting the Contact Center" [2] presents specific AI use cases, including automatic replies to customers' queries, balancing Human Interactions and Digital Touches, Robotic Process Automation tools to perform specific tasks, speech analytics for training and improvement (Voice of Customer Programs for example), intelligent Chatbots, VocalBots and Virtual Assistants, recommendation systems for specific situations where cookies and customer histories can suggest specific products or behavior.

Starting from this context, the CMMC Club (Customer Management Multimedia Competence Club) and BSD (Italian research and interaction design company) in early 2021 launched an online survey on AI in Customer Management Processes. The first hypothesis was that AI is increasing value in Customer Management Processes and it is giving to human intelligence and to human beings more power. The research started from the consideration that AI solutions are not reducing occupation and that AI tools are reducing people workload, taking care of massive and real-time data processing, repetitive low value added tasks and risky tasks for people cognitive and emotional working life, including agents, salesmen, data scientists, REPs, clerk employees, supervisors and managers. The goal of the survey was to understand how AI is currently used to create value in Customer Management processes by addressing the main solutions in place, the current and future trends and the most relevant issues to be considered in AI adoption when managing AI programs and projects.

1.1. Background

According to research promoted by Accenture [3], the adoption of Conversational Agents (chatbots, avatars and robots) can increase the return on investment of the companies with a minimal effort and investment. For example, chatbots are considered preferable over other methods of brand communication, such as email, live chat or social media because they could be potentially always active and available all the time. Conversational agents are defined as software programs which interpret and respond to statements made by users in ordinary natural language [4] based on different technologies, such as Artificial Intelligence (AI), Machine Learning (ML) and Natural Language Processing (NLP). Among the others, chatbots are Conversational agents which hold text-based or spoken conversations (also using facial expressions and gestures) with humans. They could also present themselves as a virtual person, animal, object or abstract entity. Despite their potential benefits, users are reluctant to engage with them. Chatbots usually disappoint users' expectations because people think of chatbots primarily as answering machines and they get frustrated when they can't get answers to simple questions. Moreover, recent studies [5] explain that chat-

bots' identity influences how we perceive and interact with chatbots especially for their characteristics, such as: conversational intelligence (chatbot's ability to manage user interactions); personification (chatbot's identity and personality); interactive style (regarding how users are expected to interact with the chatbot, e.g. voice, text or button); appropriate task type (what type of tasks users expect the chatbot to support) and trustworthiness (how users trust the chatbot to support them in a useful way).

These aspects related to chatbots personality could have a positive or negative influence on the perception of the company, which lead companies to address challenges related to chatbot's identity and interactive style:

Conversations with Chatbots are Generally Perceived as Unnatural and Impersonal. Implementing an engaging, "human-like" communication style that reflects the attributes of human communication, for example by using an informal language and establishing a conversational dialogue. Many researchers have investigated how relational outcomes are affected by the implementation of human-like communicative behaviors (e.g. the use of body movements, humor or communication style) in conversational agents [6].

Absence of a Specific Identity Affects User Experience, User Expectations and Interactions. Chatbots with anthropomorphic characteristics (meaning the attribution of personality or human characteristics to something non-human) affects the user experience and plays an important role in the user's decision-making process (e.g. using or not chatbots). Anthropomorphism facilitates the social interaction between user and machine and creates a socially engaging chatbot [7].

When Robots Look More Human, Our Sense of Familiarity Increases Until Arriving at a Valley, "the Uncanny Valley". Masahiro Mori argues that as robots become more human-like, people find them more acceptable and attractive than their mechanical counterparts. But when robots take on a very close human aspect, people develop a sense of discomfort and repulsion. The definition of more realistic elements (e.g. color of the skin, legs, etc.) increases the sense of familiarity, but only up to a certain point, after which humans feel rejection towards robots [8].

Many Chatbots Have Been "Discontinued" Because Don't Perform a Proper Interaction with Users. Causes are generally related to: a gap between user expectations and chatbot performance; the inability to deliver engaging and compelling conversations and to maintain conversations appropriate to the context of the conversation [9].

There is a Gender Bias in Chatbot Design: Most Chatbots are Female. People perceive computers as social actors and treat them as real social entities [10]. Therefore the trend towards gender stereotypes (deeply rooted in human psychology) is also extending to machines and chatbots. For example, most voice-based Conversational

agents are designed to be “female exclusively or female by default” [11]. This bias is particularly evident in customer service and sales. The chatbot gender is also influenced by the sector: for instance, the technology sector has a great number of men, so chatbots are often male [12].

2. Method

2.1. Participants

A specific questionnaire has been created to explore main issues related to AI in Customer Management. 30 companies responded to the questionnaire (one unique survey for each company filled out by main directors and decision makers in AI programs of Customer Management): 76,7% companies involved with more than 250 employees, representing different service sectors, including telco, media and financial services.

2.2. Procedure

Participants were invited to complete an online questionnaire [13]. The survey was conducted in February 2021 and the items of research covered the processes and activities in which AI solutions are adopted, the level of investment in Euros, the responsible and involved units, the roles affected and the main trends for the next years within a period split into “current”, “within one year”, “within three years” in order to tackle with current reality and future perspective. A specific section has been dedicated to Usability and Design topics.

3. Results

The main scientific results of the survey entailed an interest in companies to invest in AI projects and that are focusing not only on technological issues but also on the relationship between human beings and AI solutions, such as chatbots. Based on the research results, the main innovation regards the opportunity to enhance the value of AI in Customer Management, by addressing a design perspective which includes technological and system integration domains.

Involved Processes. Participants declared a strong investment in AI programs: more than 30% of respondents are investing between 50K and 100K Euros and more than 20% invested more than 500K Euros in 2021. Figure 1 illustrates the processes and services interested in AI solutions today (past investments), within one year (current investment) and in the next three years (future investment). Information management, post sales support and data analysis are the most relevant activities affected nowadays by AI, according to past investments, whether within three years, AI will be applied to document analysis, claims management and lead management. Indeed, respondents say that in the future the main investments in AI for Customer Management will be

committed to Document analysis processes (capability to read and manage documents, including text and pictures), qualitative features able to handle complaints or complex situations and lead management strategies.

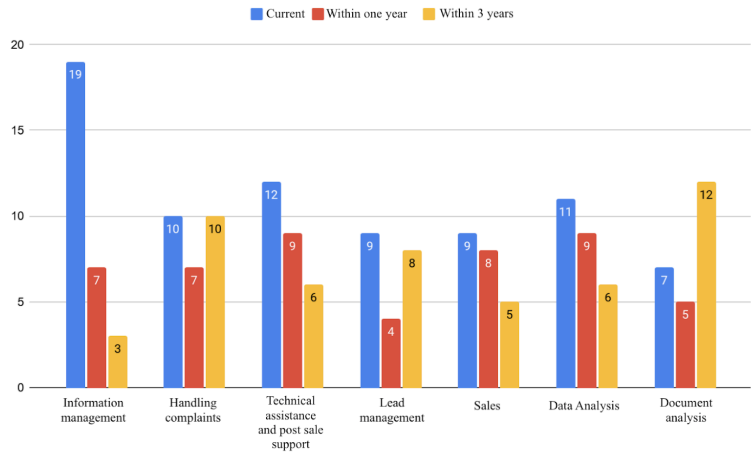

Fig. 1. Processes and services included in AI solutions today, within one year and in the next three years, according to participants.

AI Investments Scope. Figure 2 provides an overview of the investments in AI, which cover different activities: software development and maintenance/assistance is the most relevant area of work, but "tuning" and "change management" are gathering a lot of attention and energy. This scenario confirms that AI solutions are not a stage of maturity to be considered as "plug&play" solutions but require effort in terms of people involvement, tuning and configuration of machine learning algorithms and system training (supervised learning and reinforcement learning).

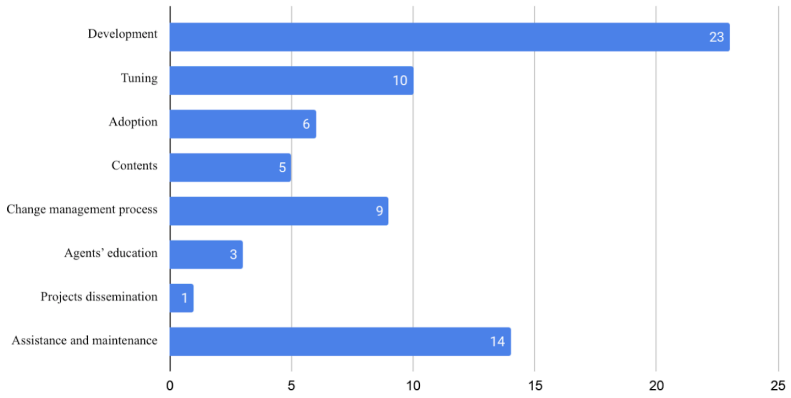

Fig. 2. State of the art of the investments in AI based on participants' responses.

AI Solutions. One of the most relevant solutions adopted by survey participants is the chatbot that takes care of the user's requests via chat and voice channels. A few sur-

vey respondents say that chatbots are already performing complex tasks (10% of respondents). On the contrary, 40% of participants believe that a chatbot will never be able to carry out articulated activities. Moreover, 43% of respondents say that in the next three years, the maturity of AI solutions will upgrade chatbots enabling them in managing complex processes and tasks.

The management of complex operations is related to the capability of an AI tool to perform "Situational Analysis" tasks by rebuilding historical data and context overview for any single request. Respondents say that in the next three years AI will be able to perfectly perform Situational Analysis (56,7%) and 16,7% say that today this is already possible with their existing technologies.

Visual Appearance. Maturity and acceptance of AI solutions is also affected by visual and interaction issues, such as the chatbot identity. Most of the companies face a dilemma between creating an agent with the appearance of a robot or similar to a real person. Respondents have different perspectives: 30% of them say that in the future chatbots will not be similar to human beings, whether 20% believe that chatbots already have a human-like visual identity, e.g. physical aspect, gestures, name, clothes, tone and communication style.

Humans-Chatbots Interactions. Furthermore, more than 50% of respondents say that users are still perceiving the interactions with chatbots "unnatural" and "unsatisfactory". This led to a consideration that despite the level of investment and attention given to AI solutions there still are some open points and question marks affecting final users, especially citizens or customers.

4. Design Approach

According to the results of the research, the respondents were involved in an online campaign aimed at improving the awareness related to the chatbot identity design. .In the following, we present the design approach to chatbot identity definition and interaction strategy based on 5 steps:

Defining the Context and the Scope. Defining the scope and the perimeter of chatbot answers. The user must have a clear understanding of the inputs that the chatbot will expect to receive in order to perform its tasks and don't create false expectations. Companies need to make decisions about where to apply chatbots in order to get the greatest return and integrate bots with the human workforce. In the next future, the collaboration between people and AI will lead companies to provide users with customized experiences, products and services, boosting efficiency and productivity.

Defining Chatbot Identity. In order to create an empathic human-machine interaction, a detailed study of the appearance and personality of the bot is essential for keeping the user engaged and satisfied with the overall experience. Companies should design the chatbot appearance (e.g. human-like or a robot style), the feelings and ex-

pectations to arouse in the user (e.g. trustworthiness). Additional characteristics regard the name and the visual aspect of the chatbot, that should be consistent with personality and interaction style.

Defining Language and Tone of Conversation. In order to establish a trusted relationship between user and chatbot, it should be important defining the chatbot language style, fostering a reassuring and professional conversational tone, according to the target audience. However, technical language could complicate communication: promoting linguistic clarity is important to reduce users' misunderstanding.

Defining Conversation Management. In order to keep the user's attention, it's important to define a maximum number of characters per message, avoiding too many scrolls while reading. Using conversational markers to provide the user with an indication of the conversation status and feedback about chatbot request understanding (e.g. sequence indicators such as "First" , "Finally" or feedback related to the interaction "I got it", "Okay" and "Great Job").

Defining Interaction Strategies. Human-chatbot interaction moves on different levels during the conversation: it is necessary to identify the most appropriate strategies according to the request and status of interaction. This approach, such as alternating free text fields with the selection of predefined answers, keeps the user engaged in the conversation. Consider some flexibility in interacting with the bot, allowing people to jump back and forth in the linear flow of the conversation.

5. Conclusions

AI solutions in Customer Management processes are becoming a strategic path for increasing value: revenues increase, cost reduction and service capabilities enlargement over multiple channels. Data processing as well as AI-based interaction solutions are focusing attention and investments. Despite an overall improvement of technological features, AI solutions still have a long run to do: AI programs require adoption and change management processes and require investments into design tasks, starting from a User-Centered Perspective.

The need to design interaction strategies leads to the goal to define proper context and scope of AI tools, including working on the chatbots' identity, such as visual appearance, gender issues and user engagement. Interactions require defining the boundaries and the integration between human-based tasks and automated tasks.. In order to make AI investments in Customer Management Processes effective and valuable, teams must include strategic, organizational, technological and design skills, starting from a design perspective, even involving final users in conceptualization, testing and prototyping, taking care of their input and feedback.

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