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STAY WITH ME - CONVERSATIONAL CHURN PREVENTION IN DIGITAL SUBSCRIPTION SERVICE

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Research in Progress

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Abstract

Lots of organizations use subscription business models. However, with increasing competition and technological progress switching costs for customers are decreasing. This development can translate to serious issues for subscription-based businesses, requiring action. Traditionally, businesses used mailings or calls, which are costly, time-consuming and often not effective. In this research-in-progress paper, we explore conversational churn prevention as a potential remedy. We present a conversational agent with persuasive design features (e.g., nudges) and first results from a pre-study. We conduct an in-between subject experiment and interviews for our mixed-methods evaluation of our pre-study. Our work contributes to theory, by presenting more insights into the interaction quality of conversational agents in the context of churn prevention of digital services and the role of persuasive design. We support practitioners, by guiding them towards more effective use of conversational agents to improve their services and to predict churn.

Keywords: Subscription Services, Conversational Agent, Persuasiveness, Churn Prediction

1 Introduction

Over the past ten years, continuous digitalization has significantly impacted our society and economy, including the service industry. Digital transformation has enabled new players to easily enter new markets and transform existing business models. This development has led to about 70 per cent of the world GDP being generated by the service industry (OECD 2016). One class of services are the so-called subscription business models that are becoming more prominent. Netflix is just one of many subscription-based service providers among others such as Disney, HBO, Sky and Amazon. This volatile landscape of subscription-based services provides the consumer with a plethora of options to choose from, hence lowering the transaction costs of switching to other platforms or providers (Dellatto 2022). In fact, 85 per cent of service business companies predict an even higher degree of complexity and demand for digital services in terms of quality, quantity and intensity of service (Deloitte 2021). Because of these transformations, many service providers struggle with staying competitive, in the case of Netflix their stock took a huge hit this year and the service provider lost over one million subscribers (Sherman and Clayton 2022). This highlights the battle subscription services have to face when dealing with customer churn or retention respectively.

Therefore, it is getting more important to avoid losing subscribed customers and to facilitate a long-term relationship with them. Subscription-based service providers have different ways to address this issue. The current status quo is to simply respond to customers after they have already cancelled and regain their attention with a new subscription, usually bundled with a small discount or other goodies. However, such approaches do oftentimes not work, for example, Netflix has so far lost one million subscribers in 2022. Intensive service interaction like this may demand additional resources, competencies and individualization or personalization of the service to meet the specific demands of each individual customer (Jaakkola et al. 2017; Lehrer et al. 2018). Thus, we propose a novel solution concept in this

article: conversational-based interaction via a text-based chatbot, also called conversational agents (CA) that are designed with persuasive design features to foster the interaction process. Because of their ability to use natural language and their communicative and human-like characteristics (Hauswald et al. 2016), CAs offer a high potential to deliver assistance and services very efficiently (Adam et al. 2020; Holz et al. 2009) naturally and intuitively (Dale 2016; Steffen et al. 2019). In fact, CAs have the potential to significantly reduce the costs of customer support (Reddy 2017) and help scale up a business (Barros et al. 2021) as well as foster personalized contextual customer service (Behera et al. 2021). Consequently, it is no surprise that many industries use CAs as means of interaction with their customer base and to facilitate service provisioning; for instance in e-health (e.g., Laumer et al. 2019), digital education (e.g., Winkler and Söllner 2018), or customer service (e.g., Qiu and Benbasat 2009; Huang and Rust 2020). Various industries including the digital service industry have already recognized the immense potential of CAs which is why CA adoption is expected to remain steady and increase even more in the future (Nordheim et al. 2019). Especially for automating service interaction and providing a more engaging mode of interaction, CAs can become a key component in providing digital services in the near future (Hollebeek et al. 2021).

However, because of unsatisfactory user experience and human-agent interaction with usual CA implementations, the adaptation is lacking and services are potentially left undone. This can then lead to customers being annoyed and losing the motivation to interact with the system (Brandtzaeg and Folstad 2018). Followingly, this may also negatively reflect on the perception of the service provider. Therefore, it is required to facilitate the interaction processes of humans and CAs to not lead to communication breakdowns and thus service breakdowns (Benner et al. 2021a; Matos et al. 2007; Poser et al. 2021). This however is still a challenging task. Therefore, we want to address this issue by implementing a CA that gathers live data including "soft" data i.e., free text on how users describe their problems and needs, from customers that wish to end their service subscription (Berger et al. 2020). This however can be a challenging task on its own as users may not be willing to disclose their information, even if it is for their own good. Therefore, we also implement persuasive design interventions in order to facilitate the interaction. Therefore, we raise our research question (RQ):

RQ: How should CAs be designed to better prevent customer churn in digital services?

In order to answer our RQ, we engage in a long-term action design research project (Sein et al. 2011). Thus, in this article, we present a first prototype and preliminary results from a pre-study.

2 Related Research

2.1 Conversational Agents in Digital Services

From a service perspective, CAs can become the single most important interface between service providers and customers (Beverungen et al. 2019). For example, in customer service (e.g., Gnewuch et al. 2017, Elsholz et al. 2019), e-commerce and sales (e.g., Stock and Merkle 2018) or marketing (e.g., van den Broeck et al. 2019). This importance is highlighted by a recent corporate study where Oracle (2019) found that companies and service providers show great interest in CA and over 80% already use some kind of CA in customer service. CAs are used to automate processes, provide support 24/7, and to structure and provide information (Hauswald et al. 2016; Zhao 2006). CA interaction is typically either text-based or voice-based (Schmitt et al. 2021). CAs use natural language and act as semi-autonomous surrogates that replace humans during service provision (Becker et al. 2013). By taking up such a surrogate role, CAs can function as social actors (Nass and Moon 2000). To act more human-like, CAs make use of features like social cues that mimic true human behaviour (Feine et al. 2019). By making them more human-like, organizations try to better facilitate the interaction aiming to create value (van Alstyne et al. 2016). In this regard, CAs can for example identify, localize, connect and compute relevant information during an interaction with the user and in doing so provide a semi-autonomous service to fulfil the users' needs (Beverungen et al. 2019; Lim and Maglio 2018). CAs are important for digital

services because of their ability to scale a service (Benner et al. 2022a), which translates to flexibility and adapting to changing requirements (Bondi 2000; Hill 1990). Furthermore, CAs can be viewed as a technology-based approach to outsource high-cost tasks (i.e., customer service) to an agent and thus provide a customizable self-service to consumers (Täuscher and Abdelkafi 2018). Overall, the role of CAs in digital services and scaling services is an enabling technology (Lewis et al. 2011). However, service providers may adapt their value creation processes and business logic depending on their current business model (Jin Zhang et al. 2015; Täuscher and Abdelkafi 2018). Accordingly, CAs are one solution to extend service provision to customers and to reduce task complexity as well as the effort and cognitive requirements of the user (Winkler and Söllner 2018). In that regard, CAs act as semi-autonomous surrogates during service provision (Becker et al. 2013).

2.2 Interaction Quality and User Experience

The interaction and communication with information systems have significantly changed over the past years, especially with the rise of conversational technology like CAs (Folstad and Brandtzaeg 2017). The focus on developing and designing a good user experience is all about designing and developing a high-quality interaction that motivates and engages the user, creating a stimulating and satisfying user experience (Sutcliffe 2009). Therefore, it is crucial to know the basic interdisciplinary (e.g., information systems, sociology or psychology) theories and models that play into interaction processes (Moore and Arar 2019). Thus, we briefly introduce theoretical concepts relevant to our research. A very prominent model from the IS domain is the technology acceptance model (TAM) which is an integral part of information systems research until today (Davis 1989; Venkatesh and Davis 2000). In the context of our research, TAM is relevant and important since we plan to install a new artefact (i.e., persuasive CA) in our digital service context that must be accepted by users to succeed. Furthermore, in order to facilitate interaction processes and user engagement persuasive design can be used (Fogg 2002, 2003). Persuasive design can help to facilitate the interaction to progress towards the user's desired outcome more effectively (Benner et al. 2022b; Schöbel et al. 2020b). The idea behind this design concept is to implement small design interventions that help facilitate communication, task completion, social situations or dialogue (Oinas-Kukkonen and Harjumaa 2009; Shevchuk et al. 2019). Past research has shown that such persuasive features can indeed help in human-agent interaction and for instance increase enjoyment and user experience during communication with the CA (Ischen et al. 2020). However, past research mostly focuses on isolated elements or not in the context of CAs and digital services (Diederich et al. 2022; Elshan et al. 2022) while others emphasize on the importance of more research on this topic (Wang et al. 2023; Zierau et al. 2021). In this article, we will draw on digital nudging (Thaler and Sunstein 2008) specifically to implement our persuasive interventions. By using this design approach, users can be nudged to change behaviour by for instance using social comparison, progress bars and colour cues that subconsciously help facilitate interactions (Barev et al. 2020; Schöbel et al. 2020a). Such design elements can improve the interaction and outcome of it for the user as well as the perception of the service provider (Diederich et al. 2022; Elshan et al. 2022) and can also have positive or negative implications for trust (Wintersberger et al. 2020) i.e., in the technology or service provider. Overall, such a design can mark a critical quality criterion for CAs and can help to leverage the potential of CAs in digital service (Lewandowski et al. 2023).

3 Research Approach and Methodology

For our general research approach, we use action design research (ADR) as introduced by Sein et al. (2011), our approach to ADR is seen in Figure 1. The idea behind ADR is to address the practical concerns of people or organizations in a specific context with an unresolved problem for which a solution needs to be found. ADR follows an interwoven three-phase iterative process that incorporates the needs of all relevant stakeholders by actively including them in the overall ADR process. Because we emphasize on the development of an innovative solution for our research problem we focus on the IT-dominant variant of ADR (Sein et al. 2011). Our ADR project and research are set in the context of digital services, specifically subscription-based services (e.g., streaming subscriptions). Thus, in our

case, the practitioner group consist of CA developers and experts from the field (i.e., subscription service business employees). The end users in our case are the B2C customers of the subscription-based services and to an extent also the B2B customers who may also have an interest in our research and prototype. The ADR process itself encompasses three major iterative steps (Sein et al. 2011): (1) the problem formulation, (2) the conceptualization of the research and (3) the build-intervention-evaluation cycle (BIE). In this article, we have addressed the first two steps in the former sections by formulating our motivation (i.e., research problem) and introducing the conceptual proposed solution. Thus, we focus on the BIE section in this article, in particular a pre-test online experiment and its evaluation as well as the planned next steps. Therefore, we focus on basic functionality and design intending to provide a first potential proof of concept.

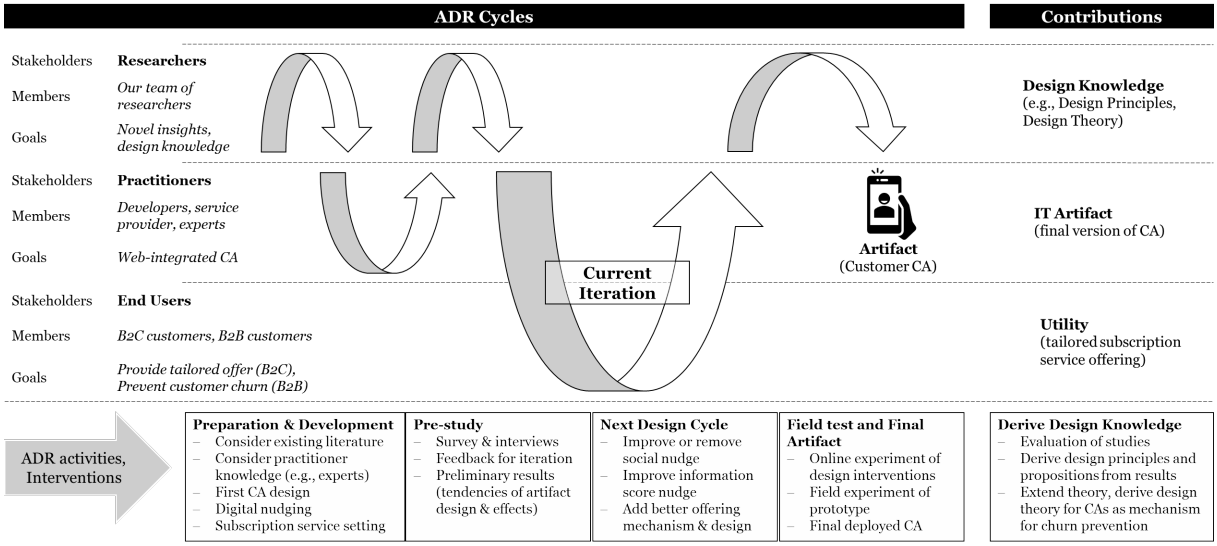

Figure 1. IT-Dominant Action Design Approach (Sein et al. 2011)

Concerning the experimental setting, we conduct a small-scale online experiment with three treatment groups. We fully randomized the treatments assigning participants in no particular order. Our control group (T0, n = 8) reflects the status quo (i.e., survey as usually used in the industry) as a form-based approach without conversational or design intervention. The first treatment group employs a conversational intervention in the form of a CA (T1, n = 15) and the second treatment group adds a design intervention on top (T2, n = 14). The general design of T1 and T2 can be seen in Figure 2. The conversational design (T1) intervention can be seen on the left where the CA requests information from the user before making a personalized offer. The design intervention (T2) can be seen on the right. Here, the CA uses social nudges (i.e., social comparison) to enable users to compare themselves and their input to other customers. Additionally, a progress bar style information score bar is implemented that reflects the user input and increases with the information the user provides to the CA. We have chosen these design elements based on input from prior research (e.g., Benner et al. 2021b; Schöbel et al. 2020a) and a focus group we held before designing the prototype.

For the prototype evaluation, we use a mixed-method approach combined with a fictional scenario. First, we construct a relatable real-world scenario that participants can relate to. In the scenario, participants have a subscription service (i.e., streaming subscription) that they wish to cancel but are instructed to try to receive a better and personalized offer from the prototype (based on the treatment group). Second, we use a questionnaire built with established scales and include an attention check to sort out fake answers. We include process and interaction quality (PIQ) (Hone and Graham 2000), persuasion for the design intervention (PSD) (Oinas-Kukkonen and Harjumaa 2009; Shevchuk et al. 2019), trust since we are in a trust-sensitive context (TTT) (Benbasat and Wang 2005) as well as TAM components to measure use and usage factors (Davis 1989; Venkatesh and Davis 2000). Additionally, we measure self-determination (SDT) (Ryan and Deci 2000), (customer) expectation (TXP) (Dietvorst et al. 2015),

prototype functionality and perceived helpfulness (TFH) (McKnight et al. 2011) of the CA to complete the task i.e., finding a suitable subscription instead of cancelling the current one. Next, we also conduct student interviews (n = 5) to enrich our experimental results with qualitative insights. Here, we use a semi-structured interview approach including a subscription task and case (Mayring 2000; Opdenakker 2006).

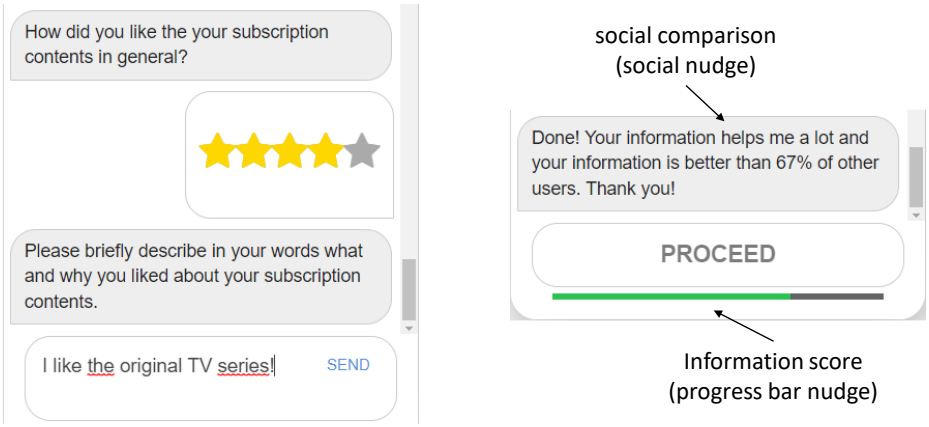

Figure 2. Prototype design and design interventions

4 Preliminary Findings and Discussion

First, we calculate the reliability of our results using CA and CR (Cho 2016; Cronbach 1951) and present findings in Table 1.

Construct	Subconstruct	Source(s)	CA	CR
Process and interaction quality (PIQ)	System response accuracy	Hone and Graham (2000)	0.876	0.890
	Affection / likability		0.940	0.942
	Cognitive demand		0.883	0.889
	Habitability		0.902	0.912
	Speed		0.682	0.426
Persuasion (PSD)	Primary task support	Oinas-Kukkonen and Harjumaa (2009)	0.858	0.863
	Dialogue support	Shevchuk et al. (2019)	0.842	0.867
	Credibility support		0.738	0.798
	Social support		0.954	0.956
	Perceived persuasiveness		0.914	0.921
Trust (TTT)	Benevolence	Benbasat and Wang (2005)	0.929	0.936
	Integrity		0.887	0.899
TAM	Perceived usefulness	Davis (1989)	0.974	0.975
	Perceived ease of use		0.886	0.898
	Intention to use		0.947	0.949
Expectation (TXP)		Dietvorst et al. (2015)	0.823	0.828
Functionality & helpfulness (TFH)		McKnight et al. (2011)	0.875	0.885
		McKnight et al. (2011)	0.943	0.944
Self-determination (SDT)	Autonomy	Ryan and Deci (2000)	0.843	0.878
	Relatedness		0.909	0.915
	Competency		0.897	0.901

CA = Cronbach's alpha (calculated with R and psych package); CR = composite reliability (calculated with R and lavaan package)
All constructs and items were measured using a 7-point Likert scale and ranged from 1 (low/disagree) to 7 (high/agree)

Table 1. Construct reliability measurement

We can observe that almost all construct measurements fulfil the quality criterion of greater or equal to 0.7 (Diamantopoulos et al. 2012; Hair et al. 2021). Only one construct does not meet this criterion: the process and interaction quality subconstruct speed with CA and CR scores of 0.682 and 0.426. At this point, we cannot explain this finding with neither qualitative nor quantitative data. According to our interview participants, the speed and length of the interaction and process are satisfactory. One participant even praised the efficiency of our prototype. Thus, these subconstructs may require special attention during our next BIE iteration.

Next, we conduct pairwise t-tests across treatment groups using R standard library with no pooled standard deviation as these are diverse in our data. Additionally, we opt for the statistically more conservative Bonferroni correction to minimize Type I error rate at the price of statistical power (Dunn 1961; Frane 2015). These results can be seen in Table 2. Additionally, we also calculate construct-wide mean and standard deviation for supplementary information of our data. A general overview of our main constructs can be seen in Figure 3.

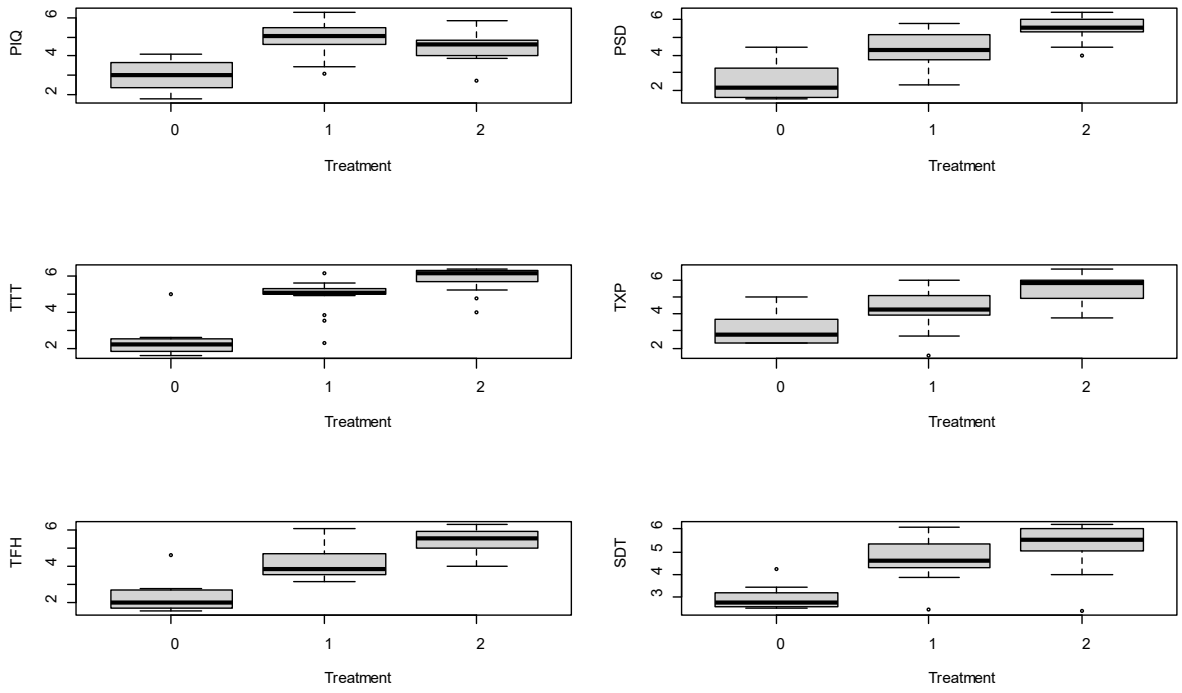

Figure 3. Construct measurement boxplots (by treatment)

It can be observed that both treatments T1 and T2 perform significantly better across the board when compared to the control group with no design intervention T0 (i.e., form-based approach.). Comparing treatments T1 and T2 differences between constructs can be observed with varying degrees. All constructs measure better for T2 except for PIQ. In this case, we can explain this finding with our additional interviews. Participants described the interaction process as slightly more lengthy, complex and bothersome because the CA is more verbose with instructions and includes more design elements. A practitioner voiced his concern that "the dialogue is too lengthy and customers may prefer shorter answers and clickable options". This was supported by our user interviews and may explain the bad loadings of the aforementioned subconstructs. We assume that these interventions harm the user perception of the process and thus plan to redesign these in the next iteration of our ADR project. Further comparing T1 and T2 we can see that the subconstructs affection/likability and habitability measure with a significant positive difference in favour of T2. Concerning persuasion and our implemented persuasive design interventions we can observe that particularly primary task support (i.e., interacting with the CA to receive a better subscription) and dialogue support show significant positive results in favour of T2. We find that this is confirmed by our interviews where all subjects agree that our approach

is likeable and preferable to the industry standard. A participant said that "talking to the CA is more personal, the provider makes the impression to be more invested in my problems. I like this much more than standard emails I usually get".

Construct	Subconstruct	Mean	SD	Pairwise t-test		
				T0 × T1	T0 × T2	T1 × T2
Process and interaction quality (PIQ)	System response accuracy	4.909	1.607	0.007**	0.000***	0.269
	Affection / likability	4.445	2.812	0.000***	0.000***	0.038*
	Cognitive demand	5.230	1.917	0.002**	0.001***	0.999
	Habitability	3.778	3.235	0.049*	0.459	0.000***
	Speed	-	-	-	-	-
Persuasion (PSD)	Primary task support	5.137	2.214	0.005*	0.000***	0.023*
	Dialogue support	4.333	3.071	0.000***	0.000***	0.001***
	Credibility support	4.295	1.790	0.164	0.021*	0.220
	Social support	-	-	-	-	-
	Perceived persuasiveness	4.153	2.455	0.005**	0.000***	0.139
Trust (TTT)	Benevolence	4.992	2.110	0.001**	0.000***	0.091
	Integrity	4.383	1.630	0.006**	0.000***	0.000***
TAM	Perceived usefulness	4.712	3.490	0.003**	0.000***	0.059
	Perceived ease of use	4..909	2.562	0.003**	0.000***	0.357
	Intention to use	4.830	3.204	0.001***	0.000***	0.112
Expectation (TXP)		4.506	1.924	0.059	0.000***	0.018*
Functionality & helpfulness (TFH)		4.288	1.903	0.002**	0.000***	0.053
		4.322	2.467	0.000***	0.000***	0.000***
Self-determination (SDT)	Autonomy	5.634	1.785	0.999	0.999	0.999
	Relatedness	3.792	2.213	0.000***	0.000***	0.360
	Competency	4.617	1.927	0.006*	0.000***	0.104
Constructs not passing CA or CR test have been excluded from further calculations *Pairwise t-tests are calculated with R standard library; significance with *p ≤ 0.05, **p ≤ 0.01, ***p ≤ 0.001*						

Table 2. Statistical measurements

Regarding the implemented persuasive design interventions, we find that both the survey and our interviews outline the positive aspects. However, participants in our interviews also voiced some criticism and potential improvements. In general, participants described the design interventions as supportive and helpful in trying to negotiate a subscription plan. Particularly the progress bar design element that informs users on the information they have provided the CA with was perceived as helpful and supportive. The participants praised the positive feedback on the input they gave. A participant said that "with the score, I see that whatever I write is somehow used" but added, "hopefully to 'my' advantage and not the companies". This highlights that the element is perceived positively in general.

However, at the same time, our interview participants voiced their desire for more transparency and information. Users did not know how their information is being calculated and used i.e., the score was not perceived as credible. A participant added that "the score could be legitimate or bogus, I don't know" and added "it's the same with the social thing, how do I know the bot is not lying to me?". This concern highlights that adding such persuasive elements may come at the cost of credibility. We can potentially see this in our experimental evaluation where credibility support is barely significant. This may outline a need for more trust and credibility supporting elements such as information or explanation about the design elements that the CA provides to the user i.e., related to explainable AI (Abedin 2022; Leichtmann et al. 2022). Further, two participants described that these features do require some cognitive demand on their part which may negatively impact the interaction. One participant stated that "I get the idea behind this, but to be honest I felt it distracted me from the task more than it helped the cause".

With regard to perceived persuasion, we observe that there is no significant difference between T1 and T2. We interpret this in a positive light as according to this finding subjects do not perceive T2 with persuasive design interventions as more persuasive. This finding reflects the general idea and mechanism behind digital nudging that works subconsciously (Thaler and Sunstein 2008). Regarding the interviews, we have observed somewhat paradoxical or schizophrenic results. While participants stated that the elements are helpful, could influence their decision and that they find the whole prototype artefact generally positive and useful, they also stated they may not be influenced when directed and questioned.

Additional findings from interviews include that participants like the intuitive design of our CA, especially the star rating system, the question dialogue of our CA that was not too lengthy but straight to the point and the friendly appearance and communication of our CA. These findings are also reflected in our pre-study with significant differences between T0 and T1/T2 and differences between T1 and T2 to some extent. This reflects the concerns of practitioners who said that users most likely prefer shorter, more direct and clickable interactions. We find this also confirmed by our interviews where a participant stated that "I understand everything the chatbot says but with it [the implemented elements] the text can be fatiguing, maybe it can be shortened somehow". Thus, we will acknowledge this shortcoming of our prototype and revise the dialogue to be more concise. Furthermore, all interview participants liked the idea of having a CA in the described use case and the chance to maybe get a better subscription deal which means spending less but still being able to consume the exact content they desire. Additionally, all but one participant said that they would not cancel their subscription in this scenario and also described scenarios on their own where such a CA would be beneficial. Considering our pre-study results these findings also support the intention to use, usefulness, ease of use and helpfulness showing significant differences to T0, with helpfulness even showing a significant positive difference between T1 and T2.

5 Next Steps and Expected Contribution

In order to answer our RQ, we engage in an ADR project and have developed a first prototype in the form of a CA and persuasive design interventions drawing on digital nudging. Our CA prototype enables users to get the chance of receiving a personalized offer that suits their needs instead of cancelling their subscriptions. Our first results reveal that while our conversational (T1) and additional design interventions (T2) do make a significant positive difference, our interviews have also highlighted potential room for improvement. Particularly the social nudge component will need a rework during the next iteration as we received mixed feedback from interviews. Thus, we will revise our social nudge intervention to be more trustworthy and comprehensible as this was major criticism during interviews. Moreover, we will redesign our information score (progress bar) to be more transparent and intuitive. Regarding the evaluation of the next iterations, we plan a large-scale online experiment. If satisfactory we will take our next prototype to a real-world field test with a digital subscription service business partner. Therefore, we expect to contribute in two ways. First, we expand theory by advancing design knowledge on persuasive design for CAs in the context of digital service. Second, we contribute to practice by highlighting how a CA can potentially help reduce customer churn in digital service. Additionally, we will derive actionable propositions for practitioners that they can use to create their own CAs or improve existing ones to help their own businesses with customer retention. Considering the limitations of our current study like the relatively small sample size as well as the potentials our mixed-method evaluation has highlighted.

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