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PERSUADING CUSTOMERS VIA CHATBOT REMINDERS: THE EFFECT OF QUIZZES

FLORENTINE VON KLEIST

Work project carried out under the supervision of:

Nikita Melnikov

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Abstract

This study focuses on funeral cover products sold via chatbots and the challenge of customer disengagement during the purchasing process. The research conducts Randomized Control Trials (RCTs) by sending reminders at various times, using informative messages and gamified quizzes as reminder types. Results indicate that all reminders significantly increase the likelihood of users resuming insurance quotes, with quizzes showing a slightly higher impact. However, no significant effect on sales transactions is observed. In summary, this study provides insights into re-engaging users in the funeral cover purchase process using reminders but questions their effectiveness in driving sales.

Keywords

1) Chatbot, insurance, reminder, statistical message, narrative message
2) Chatbot, insurance, reminder, incentivized quiz, non-incentivized quiz

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I. INTRODUCTION

The financial sector is witnessing a growing trend in steadily replacing face-to-face interactions with digital and virtual channels (Bagus et al. 2020). Technological advancements and changes in expectations and preferences of the digitally influenced younger generation exert considerable pressure on companies to adjust (Barrett et al. 2015). To remain competitive and innovative, companies in the financial sector must embrace digital transformations throughout their value chain. This includes restructuring their business models to engage with customers in new and innovative ways, as highlighted by Barrett et al. (2015).

In this financial sector, customers often find themselves overwhelmed by various product offerings, creating a challenging environment to navigate (McShane et al. 2017). Simultaneously, financial enterprises such as insurance companies constantly struggle to attract and retain their customers' attention, recognizing the importance of regular and sustained customer engagement initiatives (Ahmed 2021; Gravert 2021). Within their promotional strategies, businesses can seamlessly integrate the practice of sending product reminders to their customer base. There is extensive literature on optimizing customer engagement (Schadler and McCarthy 2012) via online reminders (Du et al. 2020; Reinartz, Wiegand, and Imschloss 2019). Particularly in the finance sector, the utilization of text reminders has demonstrated increased loan repayments (Du et al. 2020) and microloan deposits (Karlan, Morten, and Zinman 2016), indicating elevated customer engagement.

Chatbots present a viable solution to streamline complex processes to retarget customers (Rodriguez Cardona et al. 2019; Singh et al. 2019; and Koetter et al. 2019). Chatbots, often called ‘conversational agents’, are automated yet personalized virtual assistants that leverage the power of natural language processing and machine learning to communicate seamlessly

with humans (Rodriguez Cardona et al. 2019; Tsai, Liu, and Chuan 2019). They serve as valuable business tools, facilitating connections with potential customers and elevating overall customer satisfaction. The interactive nature of chatbots fosters deeper customer engagement, proving to be remarkably cost-efficient compared to traditional communication methods. Chatbots are available 24/7, providing real-time responses to consumers' inquiries, eliminating the need for long waiting times on the phone or delays in email exchanges (Tsai, Liu, and Chuan 2019; Nuruzzaman and Hussain 2020). By automating responses to more than 70% of daily inquiries that are related to insurance account information, claim status, and simple policy-related questions (Singh et al. 2019), chatbots can provide constant support. The three crucial processes within the insurance value chain are marketing, sales, customer contracts, and claim management, which traditionally involve significant paperwork (Koetter et al. 2019).

As a part of FinTech, which refers to technological innovations and development in the financial sector, InsurTech focuses on challenges and opportunities in the insurance industry (PwC 2016). InsurTechs are modern market players providing the technological component to insurance products or services, aiming to increase efficiency (OECD 2017). With technology facilitating the dissemination of information directly to customers (Erasmus 2023), InsurTechs can drastically enhance access to financial products among individuals (Tanguy et al. 2017). Mostly, InsurTechs play the role of brokers that facilitate the distribution of financial products (Erasmus 2023). Consequently, they support traditional providers by streamlining and digitizing processes along the value chain. Engaging in partnerships unlocks opportunities for both sides. Incumbents can expedite their response to the digitalization occurring in the insurance sector by collaborating with tech-savvy start-ups. In turn, InsurTechs gain access to a more extensive existing customer base that they can cultivate (Koprivica 2018).

This study is conducted in cooperation with the South African InsurTech RatherChat, headquartered in Cape Town. Its chatbot technology helps to ease the sales processes for insurance companies that primarily sell funeral, life, and health cover products within the South African insurance sector. The messenger-based chatbot provides automated guidance, generates quotes, and addresses customer inquiries throughout the purchasing process. Potential customers are acquired by spreading advertisements for specific insurance products by various providers via social media platforms. Customers click on the link and are led through the guided conversation. Individuals can personalize their optimal funeral quote, selecting the desired number of family members for coverage and specifying the coverage level. Towards the end of the process, customers are asked whether they wish to proceed with the purchase based on their personalized quote.

This study solely focuses on funeral cover products. A major hurdle in this purchasing process is the loss of numerous customers who disengage from the conversation, resulting in missed sales opportunities. Internal data from RatherChat reveal that merely 5% of acquired customers complete the sales process, with the majority dropping out at various stages throughout the interaction. Distractions, disinterest, or interrupted data coverage are potential reasons for this occurrence. While the company has already started attempts to lower attrition, it still needs to be determined what strategy to retarget users works best.

An extensive body of literature has worked on how to best re-engage customers by retargeting them in a certain way. Customer retention is critical, prompting the strategic implementation of reminders as a solid instrument to direct customers toward embracing specific actions (Gravert 2021). Other studies, such as Li et al. (2022) and Goic, Rojas, and Saavedra (2021), reinforce the efficacy of targeted reminders in a B2C context. This sheds light on the vital role of digital

communication channels in fostering interactions between customers and brands. Within their studies, customers who have been inactive for an extended period are reminded of their incomplete transactions. Given the yet still novel field of a chatbot taking over the sales agent role, the existing literature offers limited insights into addressing the optimal retargeting strategy. Consequently, this research aims to explore the potential of reminders as a potent promotional tool for re-engaging users via chatbot, encouraging them to continue with insurance quote inquiries and ultimately boosting sales of funeral cover products.

When configuring reminders to retarget users that interrupted a specific sales process, two questions are central: When is the most effective time to dispatch reminders, and how can they be optimally designed? Considering the timing component, valuable insights can be obtained from academic studies that have explored the impact of timing on survey response rates. Lindgren et al. (2020), Faught, Whitten, and Green Jr. (2004), and Lewis and Hess (2017) conduct research in related fields, aiming to identify the "best time" during the day for sending survey invitations to maximize response rates. The question of how to optimally design the reminder will be discussed in the following.

The incorporation of gamified elements into customer communication strategies has gained attention within the digital service industry, capturing interest among researchers in the realm of human-computer interaction (Eisingerich et al. 2019; Müller-Stewens et al. 2017; Thorpe and Roper 2019). As Deterding et al. (2011) outline, gamification introduces a gamified dimension to situations where interaction is required but previously lacked game elements. One approach to achieve this integration is by implementing quizzes (Sanchez, Langer, and Kaur 2020) that convey essential information about the product or service offered to customers. Existing literature has explored the extent to which the introduction of monetary incentives

enhances recipient re-engagement and motivation to complete the quiz (Brewer et al. 2013; Miller, Pater, and Mynatt 2013), examining factors such as response rates (Bosnjak and Tuten 2003; Deutskens et al. 2004; Knoll et al. 2012, Porter and Whitcomb 2003; Yu et al. 2017).

While several studies investigate the optimal timing for sending survey invites, there is a notable gap in the literature when assessing various reminder dispatch times throughout the day within chatbots. The same holds for the design. There are studies that evaluate the role of gamified online quizzes (Eisingerich et al. 2019; Sanchez, Langer, and Kaur 2020), but none of them focuses on designing reminders used in chatbots. Consequently, the objective of this study is twofold: not only to assess the efficacy of sending reminders at various times throughout the day but also to investigate how the impact varies solely based on the design.

To answer the first part of the research question, reminders are sent out to the 95% of chatbot users who dropped out of conversation at three distinct times throughout the day. Recipients are randomly allocated to a morning, noon, or evening dispatch. Considering the second part of the research question, the study employs one type of reminder sent out after users stop communicating with the chatbot. The reminder consists of a quiz in which the questions contain similar content but are presented in a gamified approach. It is further split into sub-treatments. The quiz is divided into one offering monetary compensation and one without incentivization. Following the randomization of timing and reminder type, the experiment allows the execution of several randomized control trials (RCTs). Consequently, the insights derived from this analysis will likely be relevant to the broader South African population. Recognizing the diversity of official languages in South Africa, we also undertake a subsample analysis, comparing English speakers and those who indicate other home languages. Given the random dispatch of reminders at three distinct times during the day, we can additionally categorize the

sample based on the time elapsed between the initial end of the conversation and the assigned treatment time. Lastly, we assess the impact across a younger and an older age cohort.

Existing literature demonstrates that reminders positively impact customer engagement (Gravert 2021; Li et al. 2022; Goic, Rojas, and Saavedra 2021), effectively directing attention to decision-making processes (Gravert 2021). Our study partly aligns with these findings, confirming that reminders effectively re-engage users within the chatbot purchasing process, boosting quote continuation. However, contrary to Goic, Rojas, and Saavedra's (2021) conclusion that reminders increase overall sales, our research suggests that reminders do not positively affect sales in our study context. Our contribution to the literature highlights the nuanced effects of reminders in different contexts and underscores the need to explore further their effectiveness in driving sales. This null result regarding the effectiveness of reminders on sales opens up a discussion of whether they are a sufficient promotional instrument in other study setups.

In our study, reminders effectively boost quote continuation. However, the design does not significantly influence overall sales transactions, indicating suboptimal effectiveness within our context. Our findings align with literature like Du et al. (2020) and Gravert (2021), suggesting that reminders conveying negative connotations, as in our case with funeral cover, have no positive effect on sales. Our contribution highlights the limited efficacy of negative-themed reminders in achieving sales objectives.

Second, existing literature studies the impact of sending out reminders at different times (Faught, Whitten, and Green Jr. 2004; Lewis and Hess, 2017; Lindgren et al. 2020). Although Faught, Whitten, and Green Jr. (2004) and Lewis and Hess (2017) find that specific weekdays

and hours of the day are most effective in evoking a positive response, the significant effects that are found by Lindgren et al. (2020) diminish gradually along the study period. Our results highlight positive significant results for all three times but do not show significant differences across the three predetermined time slots throughout the day. We contribute to the literature on timing as it provides insights into an industry previously not covered by such research.

This work is related to the literature analyzing the effectiveness of using gamified elements to enhance behavioral outcomes through psychological forces (Eisingerich et al. 2019; Müller-Stewens et al. 2017). By triggering curiosity and active engagement by introducing a quiz reminder, the entire experience can be more memorable (Eisingerich et al. 2019). Thorpe and Roper (2019) underscore the positive impact of gamification on increasing customer engagement and sales. Our results complement existing literature as such reminders positively affect user engagement in the first instance of the conversation stream. However, we cannot support the positive impact on sales for our study. Much existing literature has shown how incentivization can positively increase users' response rate (McLeod et al. 2013; Robertson, Walkom, and McGettigan., 2005; VanGeest, Johnson, and Welch 2007). When integrating monetary incentivization into the first quiz reminder, we observe notable positive effects on the quote continuation. However, comparing both approaches, there is no difference in the magnitude of this effect. We complement this literature by introducing novel evidence on the effectiveness of incentivization, prompting us to question whether monetary compensation used to shape user engagement positively is as powerful a tool as expected.

The study begins by providing the contextual background for the experiment in Section II. Section III outlines the specific design of the treatment, followed by Section IV, covering the methodology. Section V presents our empirical results, which will be thoroughly discussed in

Section VI. Finally, the study culminates in Section VIII, where we draw conclusions based on our findings and offer insights into potential areas for further research.

II. BACKGROUND

The experimental study is conducted within the dynamic landscape of South Africa, a country facing significant challenges related to financial and digital inclusion. This environment has led to a notable disparity between a small wealthy and a sizeable underprivileged population. According to a study by Deloitte (2017), economically disadvantaged households at the bottom of the pyramid without accessible and reasonably priced options for insurance find themselves defenseless against undesirable events such as unemployment, illness, or death. Limited financial knowledge and constraints attributed to this population group may challenge insurance providers to serve them adequately. In response to the lack of accessible insurance products, there is a growing demand for cost-efficient solutions. One of South Africa's prominent insurance products is funeral cover, deeply rooted in cultural traditions.

2.1 Financial and Digital Inclusion in South Africa

A significant segment of the South African population has relatively low levels of financial literacy. Roberts et al. (2021) conduct a baseline survey on financial literacy in South Africa from 2015 to 2020. The analysis involves a comprehensive financial quiz encompassing financial control, planning, and product selection. Results reveal a significant gap in financial literacy across various income groups. South Africa has a large income gap between population groups, exhibiting one of the highest inequality rates globally, with a Gini coefficient[1] of 0.67

[1] The Gini coefficient assesses income distribution within a specific population, ranging from 0 to 1. As the coefficient increases, so does the level of inequality. In other words, a higher Gini coefficient indicates that a small portion of the population is receiving a significant proportion of the total income for that population. (Source: Investopedia, 2023)

in 2018 (OECD 2022). Over the past few decades, South Africa has witnessed advancements in financial services, revolutionizing the landscape of products (FSCA n.d.). Financial inclusion is essential for developing an equitable society as it provides primarily underserved or excluded individuals with access to affordable financial services (National Treasury n.d.).

In line with the low coefficient of equality, digital inclusion remains a second factor that differs largely between rich and poor. Using the definition of Adedokun and Zulu (2022), digital inclusion explains the possession of adequate internet literacy skills and access to a computer or mobile phone, enabling individuals to navigate digital platforms effectively. This entails possessing a certain level of technical proficiency and the capability to access the necessary digital services when required. South Africa has one of the continent's highest mobile phone penetration rates, with an impressive 90% of the adult population owning a mobile phone and 69% of that being smartphones (Genesis Analytics 2019). Despite this encouraging statistic, the persistence of the digital divide remains a significant hurdle, preventing marginalized segments of the population from actively participating in the transformative wave of digitization. High mobile data costs further fuel the digital divide. Data is needed to ensure an internet connection. With the price of one gigabyte (ZAR 85~ four EUR) equivalent to four hours of wage for an individual earning minimum wage, South Africa queues into one of the countries with the most expensive data prices in Sub-Saharan Africa (World Economic Forum 2022).

2.2. The South African Insurance Market

Pre-Covid estimates suggested promising economic growth expectations for Africa. Combined with a largely underdeveloped insurance market, the continent was ranked the second-fastest growing region for insurance after Latin America worldwide (Bagus et al. 2020). Before the pandemic, the insurance industry in Africa was ranked the 8th largest globally, with a value of

roughly $68 billion in gross written premium (GWP)[2]. Across the African continent, South Africa accounts for just above 70% of the overall GWP, followed by North Africa, including Morocco, Algeria, Tunisia, Libya, Egypt, and Sudan, with almost 13% (Bagus et al. 2020). Figures from 2021 show that the greatest insurance uptake is dedicated to funeral cover, with 42% of the South African population insured, followed by 10% of adults covered by life insurance. Health insurance uptake comes last, with only 8% of adults insured (FSCA 2022). The South African government's attempt to offer state-managed universal funeral insurance, considering it one of the most widely held insurance products, has failed and has been postponed to a distant future (Milliman 2023). Internal political structures overshadowed by corruption, patronage, and mismanagement are relevant aspects posing a barrier to its implementation (Khasoane 2019). The prevailing poverty and inequality in South Africa create a high barrier to intergenerational mobility, exacerbating low employment rates and a significant proportion of individuals engaged in the informal sector. This underscores the unfortunate reality that society's most vulnerable members often lack the financial means to adequately protect themselves against unforeseen financial threats (UN 2020).

2.3 The Relevance of Funeral Cover

According to Berg (2011), funeral insurance is recognized as one of the earliest forms of insurance. The high uptake of funeral insurance in South Africa is embedded in a cultural context. According to Olupona (2015), a professor of Indigenous African Religions at Harvard Divinity School, ancestors are considered to exist in a realm of presence superior to that of humans in several African cultures. They are thought to hold the power to determine the fate of

[2] Gross Written Premium (GWP) is the revenue source of an insurance company composed of the total sum of insurance premiums written or issued by an insurance company during a specific period (Liberto 2020).

their descendants, thereby having the ability to grant blessings or inflict illness upon them. Hence, proper death rituals in the form of dignified farewells ensure that the deceased person rests in peace and becomes a spirit that watches over the descendants. According to Dercon et al. (2006), death has a strong social and psychological presence among many African cultures. Funerals are regarded as communal occasions that unite families and affirm a family's status within the community. The importance of funeral cover can be traced back to the development of funeral associations, as Berg (2011) describes. The key objective of so-called stokvels is to pool risk among its members. Members can receive funds through individual contributions regularly or as a transaction upon death to organize and pay for funerals. As funeral associations are mainly formed within communities among friends, colleagues, or relatives, they go beyond simply covering funeral expenses by providing emotional support and spiritual counsel. Further, burial societies are autonomous, trust-based, and member-governed funeral associations with informal agreements and fines for non-compliance. However, the absence of formal regulation increases the risk of abuse. In South Africa, many households simultaneously hold formal and informal funeral insurance due to the social significance and high cost of funerals (Bester et al. 2005). According to Writer (2020), OECD Better Life Index Data shows that average funerals cost around ZAR26,875 (ZAR20 ~ one Euro). Internal company data reveal that most chatbot users inquiring about funeral cover have a monthly income between ZAR3,500 - ZAR10,000. This indicates that an average funeral costs between 33% and 64% of annual income. Given these circumstances, relatively high funeral costs and high poverty levels create financial risks for family members.

2.4 RatherChat

RatherChat is an InsurTech with a technological approach to enhance the holistic insurance purchasing experience. Their chatbot solution lets customers obtain insurance coverage without

phone calls or face-to-face interactions. Thereby, the necessity for a middleman, such as a broker, between the insurance provider and the customer is eliminated. The startup extends its services to insurance providers in South Africa, delivering an average reduction of 80% in the cost per purchase compared to transactions conducted through the insurers' websites. RatherChat leverages the popularity of WhatsApp as its primary messenger service to engage with customers. WhatsApp's widespread dominance on the African continent is evident from Global Web Index's 2020 Flagship Report statistics, showing massive penetration rates in Kenya at 97%, followed by South Africa at 96%, and Nigeria at 95%. In analyzing the effectiveness of communication channels, RatherChat's research discovered that email encounters a 17% open rate, while WhatsApp messages raise this rate to 95%. Similarly, response rates via email range from 2-5%, while WhatsApp achieves a rate as high as 20-50%. These findings firmly establish WhatsApp as more effective than emails for sales processes.

2.5 Chatbot Technology

Employing a messenger-based chatbot solution presents insurance companies with numerous opportunities. Firstly, it addresses the growing trend highlighted by Gartner (2015) that the frequency of app downloads stagnates. With users becoming reluctant to download additional apps on their smartphones, InsurTechs relying on separate app installations or website interfaces may experience lower adoption rates than chatbot technologies. Chatbots are accessible via messaging apps that most smartphone users use daily (Koetter et al. 2019), offering a more appealing and convenient option. Secondly, chatbots eliminate the need for customers to familiarize themselves with a new interface or navigate through information-heavy websites, reducing barriers often encountered with conventional applications. Chatbots can efficiently narrow down the information relevant to the customer right from the beginning

of the conversation (Koetter et al. 2019), making the experience more seamless and user-friendly.

Despite chatbots finding widespread application in retail and e-commerce markets, as indicated by Paraskevi and Saprikis (2022), their adoption in the insurance industry has been relatively limited. One potential explanation, as highlighted by Koetter et al. (2019), is the presence of heterogeneous IT infrastructures within many insurance companies, making it challenging to implement universal data-driven AI solutions. Moreover, the authors explain that the insurance sector faces the complexities of adhering to various legacy regulations and managing high volumes of sensitive data. Ensuring the secure processing of customer data and protecting their privacy throughout the process is crucial for chatbots in this context. The study by Rodriguez Cardona (2019) reveals that customers may not yet fully trust chatbot solutions to handle insurance-related decisions without human interaction, leading them to prefer a hybrid customer interface.

III. TREATMENT DESIGN

The main challenge in chatbot communications is customer dropouts, often caused by distraction, product uncertainty, or limited financial understanding. This leads to potential customer loss due to external distractions and financial literacy issues, representing missed sales opportunities. Re-engaging customers through the chatbot by sending reminders can address these issues by providing additional information, overcoming interruptions, and gaining insights into customer preferences. Successful retargeting can result in increased sales and higher customer satisfaction.

The primary objective of our study is to understand to what extent sending reminders as a promotional strategy effectively persuades customers to buy funeral insurance. To achieve this goal, we split the analysis into two parts. Firstly, to examine the overall effectiveness of reminders, they are sent at three different time slots during the day. Secondly, the quiz reminder seeks to evaluate the impact of incorporating a gamification aspect into the process. To achieve this, we will administer the same quiz to two subgroups: one will receive incentives for a chance to win a shopping voucher for completing the quiz, while the other will not. The overarching research question we aim to answer is: Are reminders an effective tool to retarget customers, and if they are, when is the optimal time to dispatch them, and how are they best designed?

3.1 Timing of Reminders

To determine the most efficient timing for our treatments, we rely on valuable insights from academic studies exploring the impact of timing on survey response rates. Lindgren et al. (2020) conduct a study on the optimal time for survey invitations sent via email during the day. The authors highlight the presence of inconvenient periods during the day when survey invitations are more likely to be forgotten or ignored. With the advancement of technology enabling a shift towards digital communication methods, researchers face the challenge of being unable to control when potential participants read their messages despite having control over the dispatch time. This emphasizes the critical role of timing in effectively engaging individuals, according to Faught, Whitten, and Green Jr. (2004). The authors focus on identifying the "best time" during a specific day of the week, sending surveys at various times throughout the day. Building upon these three studies mentioned above, our research aims to investigate whether there is an optimal time during the day when our chosen treatments yield the highest interaction rates and may ultimately lead to a higher sales rate.

RahterChat internal data, see Appendix, reveals the total number of first interactions and total sales throughout the day for funeral insurance. Several noteworthy observations emerge from this data. Firstly, sales peak between 9 am and 10 am. This peak can be attributed to incomplete sales from the previous days and sales occurring within zero to three hours after the initial interaction. As depicted by the internal data (see Appendix), the latter is the spectrum in which most sales are converted after the first interaction. Hence, the first treatment is initiated at 6 am for our study design. Our target group likely faces extended commuting times to their workplaces, necessitating an early start to their day. By sending out treatments at 6 am, we ensure that individuals with time during their morning commute can actively engage in the sales process. Secondly, as the number of interactions remains relatively stable around noon, the second treatment is sent at 12 pm to re-engage customers during their lunch break. This approach ensures that both early and late lunch breakers receive some form of treatment, maximizing the chances of re-engagement. Lastly, the global maximum of interactions occurs between 6 pm and 7 pm. During this time, many potential customers are likely finishing their workday, allowing them to dedicate time to go through the chatbot process. Moreover, they may be able to discuss important insurance-related matters with family members. Thus, the final treatment is sent out at 6 pm to take the most out of this peak engagement period. We consciously want to avoid sending out treatments during nighttime to avoid inconvenience (Lindgren et al. 2020).

3.2 Quiz Reminders

The quiz reminder is subject to a gamification component. The integration of gamification elements in communication strategies has emerged as a trend among digital service providers (Eisingerich et al. 2019). It is applied in various domains, including the healthcare sector for promoting physical exercise, the education sector for enhancing learning experiences, and

corporate environments for fostering positive organizational behaviors (Seaborn and Fels 2015). The increasing prevalence of mobile technology has further facilitated the utilization of gamification for greater customer engagement (Müller-Stewens et al. 2017). Gamification, as defined by Deterding et al. (2011) and Huotari and Hamari (2011), underlies the objective of enhancing user engagement by incorporating game-like elements. It entails integrating challenges, rewards, competition, and progress tracking to improve user engagement and motivation (Eisingerich et al. 2019).

The topic of increased participation through incentive schemes is broadly discussed in the literature (Brewer et al. 2013; Miller, Pater, and Mynatt 2013; Yu et al. 2017). Dillman (1978) argues that an individual's choice to participate in a survey heavily depends on the costs they identify with participation and the individual's expected benefit gained from that participation. We aim to assess the effectiveness of incentivized and non-incentivized quizzes, employed as sub-treatments for the second reminder type, on retargeting chatbot users and driving sale transactions. Incentives are considered one major factor in increasing the response rate of customers (Yu et al. 2017). Both monetary and non-monetary forms can be used to persuade customers into behavioral change. When a financial incentive is offered alongside an online questionnaire or survey, it tends to boost user participation and active engagement with the content, implying an increased response rate (McLeod et al. 2013; VanGeest, Johnson, and Welch 2007). This approach can steer behavior in a manner that makes it an effective tool for enhancing user engagement as individuals are well aware of rewards and incentives (Robertson, Walkom, and McGettigan. 2005).

Studies conducted by Knoll et al. (2012) and Robertson, Walkom, and McGettigan (2005) look into the type of monetary compensation for online surveys and find lottery[3] incentives to be effective in engaging with individuals. Using incentives, like financial rewards, to increase survey responses can similarly be applied to financially incentivize users to participate in a quiz. This quiz can serve as a means to provide users with additional product information and rekindle their engagement in the chatbot conversation. Supported by findings by Bosnjak and Tuten (2003) and Kalantar and Talley (1999), implementing a lottery in web surveys and questionnaires positively influences individuals' attitudes towards participation, resulting in an increased actual completion rate. Contrarily, non-incentivized quizzes forgo any monetary compensation upon completion. The renunciation of compensation implies providing additional informative content to the participant. User engagement may be predominantly driven by intrinsic motivation, influenced by the aspects of a survey, such as the survey topic (Shamon and Berning 2019).

Employing quizzes to elevate user engagement represents an innovative application of gamification. A profound sense of accomplishment can be triggered by presenting users with a clear view of how far they have come, further fueling their motivation to engage and complete the quiz (Zichermann and Cunningham 2011; Raymer 2011). MacInnis and De Mello (2005) support that access to a progress-tracking format can profoundly impact participants' perception of their ability to achieve their goals. In conjunction with rendering the participant's progress transparently, Zichermann and Cunningham (2011) and Lee and Hammer (2011) expound on

[3] Lottery refers to the case where a winner is randomly drawn and announced from all participants who successfully completed the quiz. The selection process is mainly done electronically to ensure fairness. Vouchers, in contrast, are handed over to all participants who completed the quiz.

integrating feedback at every stage of the process. They recognize feedback as the pivotal game tool that breaks the monotony of conventional conversations between chatbot and user. It enables individuals to grasp their performance more effectively and circumvents any negative associations with failure, fostering a more constructive and supportive learning environment. Rather than merely providing a binary response of correct or incorrect, the quiz should be crafted to offer valuable insights into the underlying reasoning behind each answer and clarify why specific answers may be wrong (Raymer 2011).

In the context where gamified quizzes convey additional information, gamification is a prominent and influential strategy (Sanchez, Langer, and Kaur 2020). Empowered with a tool to enhance individuals' awareness and comprehension of insurance, companies can enable their customers to make more informed and sound financial decisions (Lusardi and Mitchell 2011). To our best knowledge, there is no existing literature on the effectiveness of sending out incentivized and non-incentivized quiz reminders via chatbots in the insurance context. Hence, we aim to fill this gap by employing a quiz reminder to retarget users and increase sales transactions.

The quiz is a gentle reminder to re-engage customers in the sales purchase process if they had previously stopped it for various reasons. Its gamification elements provide a playful approach to delivering information on the importance and benefits of funeral cover, simplifying access to financial knowledge for users. Utilizing the quiz to enhance customers' financial awareness, has the potential to increase the uptake of financial service products. Participants of both treatments are greeted with the same introduction, acknowledging their prior absence from the conversation. Both treatments follow a similar structure, with one key distinction. Customers

receiving the incentivized quiz can win a R1,000 grocery shopping voucher upon completing all quiz questions[4].

Users can access the terms and conditions and privacy policy through an external link to ensure data privacy and transparency. Additionally, they are informed about the estimated time required to complete the quiz. Upon taking the quiz, participants are guided through six single-choice, multiple-choice, and true/false questions. The quiz aims to effectively convey information about funeral cover to users, persuading them of its importance and encouraging them to revisit and proceed with the quotation process, resulting in a sales transaction. The content of the quiz is intended to highlight the substantial costs associated with funerals in South Africa (Moonstone 2022). It also elucidates the structure of the coverage and advantages that come with a successful purchase. Both quizzes' specific structure, content, and reactions are shown below. Each answer provided by participants triggers immediate feedback, aiming to foster a genuine learning experience. Correct responses are reinforced with affirmations and positively connotated emoticons, while incorrect answers are followed by clarifications to facilitate comprehension and knowledge retention. The progress tracking feature keeps customers informed of their achievements to enhance the sense of accomplishment during the quiz. Once participants reach the halfway mark of the quiz after the third question, they will receive a notification. This update provides transparent information on their progress, giving them a clear understanding of how far they have come and what remains ahead. Participants answering the incentivized quiz are again informed of the prospect of getting closer to winning

[4] According to research conducted by Bosnjak and Tuten (2003), Göritz (2006) and Porter and Whitcomb (2003), increasing the size of the incentive has no positive linear effect on the response rate. No significant impact can be found between announcing a single winner of a high-value voucher or splitting it up into multiple smaller ones.

a voucher. Once completed, customers are offered the option to continue the quote and guided through the sales process equally to customers who choose to continue once they have received the message reminder. The quiz reminder is built as follows.

Structure for the Incentivized Quiz[5]*:*

Hey, we noticed that you did not finish the funeral insurance purchase. As a valuable RatherChat customer, we invite you to participate in our quiz that gives you key insights into the benefits of funeral insurance.

PRIZE: By participating, you'll have the chance to win one R1,000 Checkers shopping voucher. The winner announcement will be on the 1st of September.
T/Cs: https://tsandcs.online/barriers-to-insurance-survey/
Privacy Policy: https://www.comparisure.co.za/privacy/
Time to complete: Less than 6 minutes

Get more information on funeral insurance today by clicking Take Quiz below.

Q1: True or False: Funeral insurance can help protect your loved ones from bearing your funeral-related costs.
- *True (Correct!)*
- *False (Not quite, funeral insurance prevents your family from facing an overwhelming financial burden)*

Q2: What happens if someone passes away without funeral insurance?
- *Government covers costs (Unfortunately not - the government does not provide any assistance for funeral costs)*
- *Family members must pay (Fantastic!)*

Q3: What expenses does funeral insurance typically NOT cover?
- *Funeral service costs (This is included!)*
- *Transportation fees (This is included!)*
- *Coffin or urn (This is included!)*

[5]The non-incentivized quiz shares identical introductory content and questions with its incentivized counterpart, with two key distinctions: first, it lacks the initial and concluding prize announcements, and second, the message following the third question, which indicates progress, merely serves as a reminder that participants have reached the halfway point, omitting any mention of the opportunity to win.

- *Loan repayment (Exactly, no financial obligations, such as loan repayments are covered)*

Progress tracking message for the incentivized quiz: Hey, you are halfway there and closer to your chance of winning a R1,000 Checkers shopping voucher! Keep up the good work!

Q4: Can funeral insurance cover multiple family members?
- *No, only policyholder (Nope, there is more! It can cover the policyholder and up to 21 additional family members.)*
- *Yes (That's right!)*

Q5: True or False: Funeral insurance typically offers immediate coverage in the case of accidental death.
- *True (Correct!)*
- *False (Almost! Cover is with immediate effect if the death is an accident. For non-accidental causes, payout will only happen after 6 months from when the cover is started.)*

Q6: How does funeral insurance benefit you and your family?
- *Beloved farewell (Correct but it also prevents any financial hardship to family members)*
- *No financial hardship (Correct but it also enables a dignified farewell of the loved one)*
- *Both answers are correct (Awesome!)*

Thank you for completing the quiz. We truly appreciate your time!
You are now entered in the draw for one R1000 Checkers shopping voucher. The winners will be announced on the 1st of September 2023.
Do you want to cover insurance now? Just click "Continue Quote" and you will be guided through the process.

IV. METHODOLOGY

Group Part

4.1 Data Collection

The primary objective is to address the core research question of whether reminders can effectively retarget customers who initiated the funeral purchasing process via chatbot but discontinued before concluding a sales transaction. To collect data for our study, we utilize RatherChat's chatbot and employ two automatic reminder dispatched at three times during the

day. We implement a condition to ensure that individuals who halted the process shortly before a threshold time do not receive a reminder immediately after. According to this, the earliest reminder can be sent out two hours after their last interaction with the chatbot. For instance, if a customer stops the process at 11.30 am, the earliest possible reminder they could receive would hence be at 6 pm. The sample includes 5,186 observations collected over a total period of eight weeks.

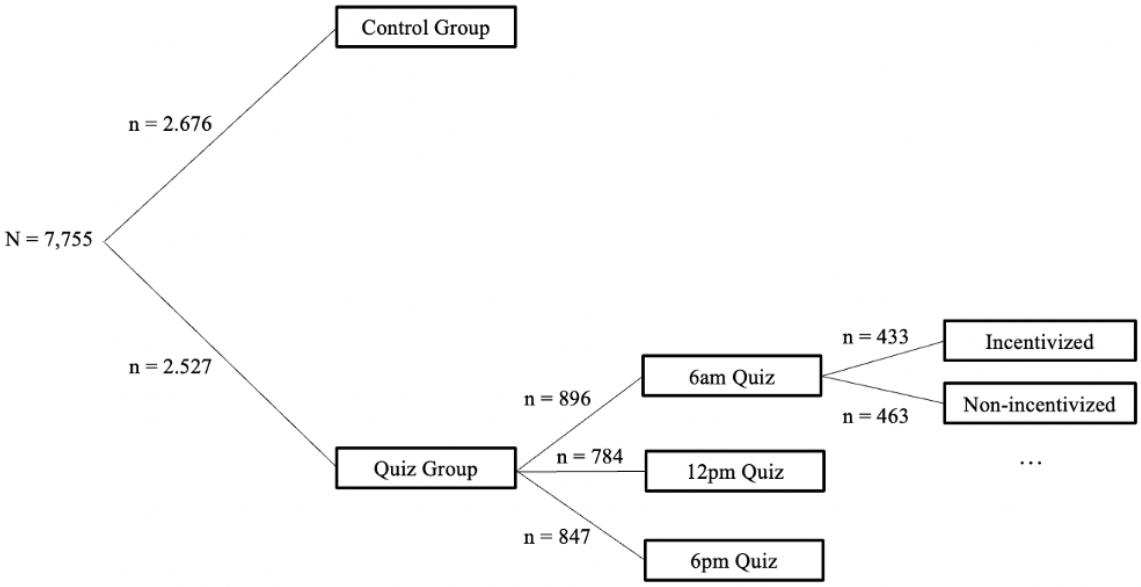
If a customer receives either the incentivized or non-incentivized quiz, they will be invited to take the quiz, implying a successful re-engagement with the chatbot user or to opt out by selecting 'not now'. Users can still proceed with their quotation despite the option to skip the quiz and entirely discontinue it once started. Once the quiz has been completed, like the design of the two messaging treatments, the customer is then provided the option to continue the quote to be led back to the point where they initially stopped the process and thus offered the chance to complete the purchase process. For the quiz group, customers that take up the process after receiving a treatment but again terminate after that will not receive another reminder.

4.2 Randomization

Each individual within our sample of 5,186 observations is randomly allocated to a specific group. Firstly, roughly one half (n = 2,676) is assigned to the control group, where the observations are excluded from any intervention. This group serves as a benchmark with which the actual effect of the treatments can be determined. The other half is allocated to the quiz group (n = 2,527), as shown in Figure 1 below. Participants receive an incentivized or non-incentivized quiz when allocated to the quiz group. Simultaneously, each treated participant randomly receives the reminder at one of the three preselected time slots. For instance, 433 individuals are invited to take the incentivized quiz in the morning. This randomized process

allows an overall effect of the quiz reminder and a comparison among the two sub-groups. Further, we can accumulate over the specific time slots, irrespectively of which reminder type has been sent. This results in a sample size of n = 896 for participants receiving any reminder in the morning, n = 784 at noon, and n = 847 in the evening.

Figure 1: Randomization of the sample



4.3 Dependent Variables

To effectively measure reminders are an effective tool to re-target customers who have interrupted the purchasing process, we specify two outcome variables. Firstly, we utilize a binary variable that takes on a value of one if the chatbot user engages in the conversation after receiving one of the four sub-treatments at one of the three times of the day. If users continue the quote, it is considered successful retargeting, allowing them to proceed with the funeral insurance purchasing process. Secondly, the outcome variable sale is also designed as a binary variable, taking on a value of one if a sale occurs and zero if otherwise. From a marketing

strategy perspective, the ultimate goal of sending reminders is to increase sales. Hence, this outcome variable is core to our analysis, in which we want to test the effectiveness of reminders.

4.4 Independent and Control Variables

Throughout collecting data, we gather a range of variables that can serve as explanatory factors in our analysis. The treatment variables are of particular importance, which indicate the specific reminder each customer received and the corresponding time of day when the treatment was administered. Moreover, we capture data on various interaction moments, such as when the initial conversation and the conversation after re-targeting ended. In addition to these interaction-related variables, we collect various socio-economic data such as number of children, language spoken at home[6], and the number of policy members. Additionally, conducting a subsample analysis with the variable age is only possible. Throughout the chatbot conversation the users are not asked to provide their age until shortly before finalizing the policy contract. The dataset does not contain the variable gender, as it is not required for generating a quote on funeral cover and hence not asked for throughout the process within the chatbot conversation. For a comprehensive list of variables, their corresponding names in Stata, and detailed descriptions, please refer to the Appendix.

4.5 Hypotheses

The hypothesis testing is split into two sections, Panel A and Panel B. The objective of Panel A is to investigate the effectiveness of sending reminders on the two outcome variables, continue quote and sale. In the analysis, the three preselected time slots - morning (6 am), noon (12 pm), and evening (6 pm) - are considered to further explore the optimal timing of sending

[6] South Africa has eleven official languages, namely English, Afrikaans, isiNdebele, isiXhosa, isiZulu, Sesotho, Sepedi, Setswana, siSwati, Tshivenda, Xitsonga. English serves as the common language of communication (Alexander 2023).

reminders. To test the optimal time of dispatch, all reminders regardless of their type are accumulated. The guiding hypothesis states:

A) H1: Reminders are an effective tool to retarget customers at a specific time of the day, irrespective of the type of reminder sent.

Panel B builds upon the previous Panel by further investigating how the reminders should be designed to successfully retarget chatbot users. In this section, the timing component is neglected as it solely examines the optimal design of reminders. For this purpose, Panel B.i) explores the effectiveness of the predefined design for quizzes in general. While in a second step, in Panel B.ii) this broad type is specified into its subgroups: incentivized and non-incentivized quizzes. The hypothesis states:

B) H1: Regardless of the time of the day, an effective reminder design exists to re-engage customers who abandoned the purchasing process.

4.6 Empirical Specification

In Panel A of our empirical testing, we aim to identify the optimal timing to re-engage with customers who had previously stopped their purchase process of funeral cover. We evaluate the effectiveness of each time slot based on the two key outcome variables (*outcome*): continue quote (*cont_quote*) and sale (*sale*). We employ linear regression models to analyze the impact of these time slots on each outcome variable. In these models, the coefficients β_1, β_2, and β_3 represent the influence of receiving a reminder at 6 am (*morning*), 12 pm (*noon*), and 6 pm (*evening*), respectively. The error term e in the equation measures the disparity between the

actual outcome variable value and the predicted value generated by our model calculations. The linear regression model is given by Equation 1:

$$1)\ outcome = \beta_0 + \beta_1 \times morning + \beta_2 \times noon + \beta_3 \times evening + e$$

In Panel B, we analyse the impact of *quiz* reminder on the outcome variables. In a second specification, we examine the effect of an incentivized quiz vs. non-incentivized quiz on the three outcome variables, regardless of timing considerations. Equation 2 measures the effect of the reminder type on the dependent variables. Similarly, Equation 3 illustrates the linear regression model for measuring the effect of the specific sub-treatments.

$$2)\ outcome = \beta_0 + \beta_1 \times quiz + e$$

$$3)\ outcome = \beta_0 + \beta_1 \times incentivized + \beta_2 \times non\_incentivized + e$$

V. RESULTS

5.1 Empirical Results

Table 1 presents Panel A and B results using the dataset with N=5,186 observations. In Panel A, we observe highly significant results regarding the effectiveness of reminders. Based on this finding, we can confidently reject the null hypothesis regarding quote continuation, indicating that reminders effectively retarget customers, thereby supporting the alternative hypothesis. For instance, sending out reminders at noon, irrespective of their type, leads to an approximately 18% increase in the likelihood of users to continue the quote. The difference in the coefficients of the three day times is smaller than the standard errors between them, indicating that it cannot be said with certainty which time is most effective for quote continuation. Albeit promising significant effects on the uptake of further conversation after receiving a reminder, none of the

three time slots reveals a positive effect on completed sales transactions. This result indicates that the null hypothesis cannot be rejected regarding sales, implying that sending reminders does not necessarily lead to increased completed transactions. Reminders serve as a valuable tool to retarget customers but fail to evoke a positive influence on sales.

Table 1: Overall results of RCTs

	(1) Continue quote	(2) Sale
Panel A. Direct impact of timing		
Morning (6 am)	0.164	-0,004
	(0.17)***	(0.003)
Noon (12 pm)	0.18	0.004
	(0.019)***	(0.005)
Evening (6 pm)	0.149	0.005
	(0.018)***	(0.005)
R squared	0.12	0.02
Observations	5,186	5,186
Panel B. i) Direct impact of reminder type		
Quiz	0.166	0.002
	(0.012)***	0.003
R squared	0.12	0.02
Observations	5,186	5,186
Panel B. ii) Direct impact of sub-reminder type		
Incentivized quiz	0.16	0.002
	(0.015)***	(0.004)
Non-incentivized quiz	0.17	0.001
	(0.015)***	0.004
R squared	0.12	0.02
Observations	5,186	5,186

Note: *** p<0.01, ** p<0.05, * p<0.1. Reminders increase the likelihood of quote continuation but have no impact on sales. The unit of observation is a chatbot user. Panel A reports the result when reminders are dispatched at three times during the day. Panel B.i. shows results for the general quiz reminder, Panel B.ii. represents findings splitted by subcategories. Column 1 and 2 present results regarding two outcome variables, quote continuation and sales transactions. Controls include the difference between the end of the initial conversation and receipt of the reminder, the number of members insured under the policy, the language spoken at home, and the number of children. The robust standard errors are reported in parentheses.

In Panel B.i), we find a strongly positive impact for quiz reminders on the probability of users to continue the quotation within the chatbot conversation. This result favors the alternative hypothesis, emphasizing the effectiveness of the reminder design when retargeting chatbot

users. With an approximately 17% increase in the likelihood of recipients continuing the quote, quiz reminders have a statistically significant impact on average. Considering the impact of the reminder on sales, the results fail to reject the null hypothesis for the second outcome variable. Like findings in Panel A, sending such reminders does not yield higher sales transactions. While approximately one half of total sales in the sample is completed by the control group, the other half is attributed to the quiz reminder group, as shown in Table 2. Hence, the findings support that the impact of reminders on sales approaches zero.

Table 2: Distribution of completed sales among reminder types

	Control Group	Quiz Receiver
Sale	32	34
No Sale	2,613	2,507
Observations	2,645	2,541

Note: Table shows equal distribution of sales among the control group and the treatment group, message quiz receiver. Total observations sum up to 5,186.

According to the results in Panel B.i), we endorse the hypothesis that dispatching quizzes exerts a notably significant and positive influence on users' likelihood to continue the conversation. According to the results in Panel B.i), re-engagement with the chatbot increases for quiz recipients. When distinguishing between incentivized and non-incentivized quizzes in Panel B.ii), both quiz types show consistently similar effects with an average 17% increase in the probability of continuing the conversation. These results support the alternative hypothesis. However, no clear distinction can be made to tell which quiz types significantly impact the first outcome variable. It appears that the chance of winning may not have a superior impact. Results for the impact of quiz reminders on sales in Panel B.ii) show that both forms, incentivized and non-incentivized, are insignificant; thus, we fail to reject the null hypothesis concerning completed sales transactions.

5.2 Subsample Analysis

In the diverse regional landscape of South Africa, we encounter a variety of eleven official languages, all of which are represented in our sample. Approximately 60% of the individuals in our study disclose English as their primary language spoken at home. It is important to note that many South African citizens are bilingual, with English as a common language for communication. Hence, some individuals may indicate English as their first language but also speak one of the other ten languages at home. Following English, the second-largest group in our dataset comprises isiXhosa speakers (9.35%), followed by those who identify themselves with the Zulu language (8.72%). The distribution of the eleven languages within our dataset is shown in the Appendix.

Table 3: Panel A results clustered by language spoken at home

	(1)	(2)	
i) Continue Quote	English	Other	Prob > F
Morning (6 am)	0.173	0.148	0.415
	(0.021)***	(0.03)***	
Noon (12 pm)	0.203	0.145	0.059
	(0.023)***	(0.03)***	
Evening (6 pm)	0.145	0.151	0.831
	(0.023)***	(0.029)***	
R squared	0.145	0.1	
Observations	3,101	2,085	
ii) Sale			
Morning (6 am)	-0,004	-0,004	0.975
	(0.004)	(0.006)	
Noon (12 pm)	-0,004	0.018	0.035
	(0.005)	(0.010)*	
Evening (6 pm)	0.002	0.009	0.423
	(0.006)	(0.009)	
R squared	0.02	0.02	
Observations	3,101	2,085	

Note: *** p<0.01, ** p<0.05, * p<0.1. When split by language spoken at home, reminders increase the likelihood of quote continuation but have no impact on sales. The unit of observation is a chatbot user. Column 1 and 2 present results regarding the two subgroups, English and any other language. Controls include the difference between the end of the initial conversation and receipt of the reminder, number

of members insured under the policy, language spoken at home, and number of children. The robust standard errors are reported in parentheses.

To draw further conclusions on Panel A, the sample is subdivided into an English-speaking group and one containing all other languages. As shown in Table 3, the coefficients describing the relationship between timing and the likelihood of chatbot users continuing the quote exhibit significance across all three time slots for the English subgroup and all other languages. Consistent with our initial results, the reminders have no significant impact on funeral insurance sales. When employing a Wald test to investigate whether the coefficients between the two groups have significant differences, we find that they are consistently equal. Thus, it cannot be concluded that there are major differences among language groups when retargeting chatbot users.

To obtain more intricate findings for Panel B.i.), we establish subcategories by examining the time interval between the conclusion of the initial conversation and the moment of the reminder dispatch. These subgroups are categorized into four segments, each representing a specific time interval in hours. The first group, in which reminders are sent within the first five hours after the initial interaction stops, is a reference to which all other groups are compared. Results are shown in the Appendix. Conducting the Wald test, we discover that all coefficients in the subgroups are not statistically different from those in the reference group. Hence, no recommended time interval between the end of the initial conversation and dispatching reminders can be derived. Further, these results reveal consistency with those found in Panel B.i).

5.3 Robustness Check

Considering the age distribution regarding sales, as shown in the Appendix, we observe that most sales occur within the middle-aged population until age 45. Knowing this, we want to

investigate if the effect of the reminders differs when the sample is categorized into two age groups. This analysis requires age as the determining factor of categorization, which reduces the sample size to 2,923 as the dataset does not entail the variable age for all 5,186 observations. Still, when observing the results on quote continuation in Table 5, we see no major differences in the coefficients compared to the general analysis. In contrast to previous findings for the second outcome variable sale, this subsample analysis reveals significant results for the age group older than 45. Looking into the distribution of sales among the control group and two reminder groups, the data show an equal distribution across the age group younger than 45, as shown in Table 4. In contrast, almost all sales in the second sub-group, aged above 45 years, are either attributed to the control group or recipients of the quiz, with only one purchase being made after receiving a message reminder.

Table 4: Distribution of completed sales among control group and quiz reminder clustered by age

Age <= 45	Control Group	Quiz Receiver
Sale	20	23
No Sale	1,015	965
Observations	1,035	998

Age > 45	Control Group	Quiz Receiver
Sale	12	11
No Sale	447	430
Observations	459	441

Note: Equal distribution of sales among the control group and the two reminder types for chatbot users aged below 45. Almost zero sales under message receivers when aged above 45.

Table 5: Overall results categorized by users aged below and above 45 years

	i) Continue quote			*i) Sale*		
	(1) Age <= 45	(2) Age > 45	Prob > F	(1) Age <= 45	(2) Age > 45	Prob > F
Panel A. Direct impact of timing						
Morning (6 am)	0.181	0.191	0.84	-0,006	-0,01	0.754
	(0.03)***	(0.048)***		(0.007)	(0.013)	
Noon (12 pm)	0.208	0.144	0.166	0.003	0.017	0.458
	(0.032)***	(0.046)***		(0.009)	(0.018)	
Evening (6 pm)	0.178	0.138	0.376	0.015	-0,006	0.15
	(0.03)***	(0.045)***		(0.011)	(0.014)	
R squared	0.08	0.06		0.01	0.01	
Observations	2,023	900		2,023	900	
Panel B. i) Direct impact of reminder type						
Quiz	0.194	0.157	0.24	0.004	0.000	0.679
	(0.021)***	(0.032)***		(0.006)	(0.011)	
R squared	0.08	0.06		0.01	0.01	
Observations	2,023	900		2,023	900	
Panel B. ii) Direct impact of sub-reminder type						
Incentivized quiz	0.209	0.136	0.071	0.005	-0,001	0.648
	(0.026)***	(0.04)***		(0.008)	(0.013)	
Non-incentivized quiz	0.178	0.175	0.94	0.003	0.000	0.82
	(0.026)***	(0.039)***		(0.008)	(0.013)	
R squared	0.08	0.06		0.01	0.01	
Observations	2,023	900		2,023	900	

Note: *** p<0.01, ** p<0.05, * p<0.1. Robustness check. Reminders increase the likelihood of quote continuation, irrespective of age group. In the form of messages, they negatively impact sales in the group of users above 45. No other impact on sales. The unit of observation is a chatbot user. Panel A reports the result when reminders are dispatched at three distinct times during the day. Panel B.i. shows results for the quiz reminder, Panel B.ii. represents findings splitted by subcategories. Column 1 and 2 present results regarding the two subgroups, age below 45 and above 45, respectively. Controls include the difference between the end of the initial conversation and the receipt of the reminder, number of members insured under the policy, language spoken at home, and number of children. The robust standard errors are reported in parentheses.

A similar number of sales for the control group and the treatment group receiving the quizzes exists, independently of the age group, emphasizes the lack of significance in the coefficients associated with the quiz for this subsample analysis. Since the younger and older populations exhibit similar responses regarding translated sales transactions, age does not seem to play a differentiating role on the effectiveness of quiz reminders in driving sales.

VI. DISCUSSION

6.1 Overall Results

Many of the existing studies in the literature have consistently demonstrated that reminders positively impact driving customer engagement (Gravert 2021; Li et al. 2022; Goic, Rojas, and Saavedra 2021). Reminders can embrace specific behavioral action, effectively directing attention toward critical decision-making processes (Gravert 2021). Li et al. (2022) reinforce the effectiveness of reminders as e-coupons on retargeting customers. The implementation of targeted reminders for coupons significantly boosts the coupon redemption rate. Additionally, Goic, Rojas, and Saavedra (2021) focus on reminding customers about incomplete transactions or rekindling engagement with those inactive on websites for extended periods. Their study yields significant outcomes, particularly regarding the effectiveness of such reminders in increasing revenues through online channels. Our findings support the notion that users can be effectively retargeted through reminders within the chatbot purchasing process. We observe significant positive coefficients on quote continuation, regardless of the treatments applied to different subgroups. Hence, our findings align with Gravert (2021) and Li et al. (2022), indicating that engagement can be enhanced when using reminders as promotional tools. However, we cannot support the conclusion put forth by Goic, Rojas, and Saavedra (2021) that reminders can increase overall sales. On the contrary, reminders appear to have no positive effect on sales.

In our study context, reminders effectively persuade users to continue the quotation. However, despite this positive effect on quote continuation reminders designed as quizzes do not sufficiently influence overall sales transactions. This suggests that the design may not be optimal within our specific study context. Our findings align with literature, such as Du et al. (2020) and Gravert (2021), which indicate that reminders conveying the likelihood of an

undesirable situation may have no effect or even a negative impact on the desired outcome. Our contribution to the literature underscores the limited effectiveness of reminders with negative connotations in achieving sales objectives, corroborating findings from related studies.

As previously outlined, several external factors may hinder the completion of the purchase of funeral cover. Firstly, a product requiring a stable income may not be affordable to many retargeted chatbot users. Even though quotes start as low as ZAR20 (~ one EUR), this might still be beyond the possible for individuals with sporadic employment. Secondly, many people interacting with the chatbot might use the service to compare different product offerings to seek the best quotation. Consequently, retargeted customers may be interested in obtaining a personalized quotation and not proceed with the purchase transaction. Thirdly, once the purchasing process reaches a stage in which personal details must be shared such as the provision of identification, bank provider, and account details, they may be deterred by the administrative effort and prefer to stop the process. Fourthly, external distractions may make it impossible for users to continue the conversation. Such distractions could be due to work or family-related obligations, other push notifications on the phone resulting in a loss of attention, or a network disconnection. Fifthly, as section two of this paper describes, funeral associations play an important role in South African communities. Despite the higher risk of mismanagement and corruption of informal means of funeral cover, many citizens may not be inclined to enter contracts with formal insurance providers. The latter lacks the emotional support and spiritual counsel that funeral associations can offer. Sixthly, as previously mentioned, the cost of data can also result in a hindrance, as it is relatively expensive in South Africa and thus an exclusive resource for some users. Finally, achieving successful contract completion may hinge on two critical factors: a comprehensive grasp of the product's financial scope and a proficient use of digital devices. These factors can potentially deter individuals

from fully understanding the complexity of the product or feeling overwhelmed using chatbot technology for purchasing activity. Users may lack trust in this novel technology when handling sensitive information, leading users to hesitate and thus fully engage in the digital purchasing process.

Our contribution to the literature opens a significant avenue for discussion. Considering that marketing is a well-established sector in most companies with substantial resources allocated to crafting promising promotional strategies, it is intriguing to encounter a robust null result regarding the effectiveness of reminders. While we do not intend to cast doubt on marketing as a whole, we do wish to emphasize that sending reminders does not contribute to increasing sales in our specific case. This represents only a small contribution to the broader topic. However, further research examining whether these results hold in regional markets or for various products could be insightful.

6.2 Timing

To the best of our knowledge, no existing literature specifically examines the impact of sending reminders at various times throughout the day on the continuation of a conversation via chatbot and subsequent sales transaction. Academic studies on the optimal timing of sending survey invitations reveal that certain time slots can be more effective regarding response rates. For instance, Lindgren et al. (2020) find significant short-term effects, suggesting that sending surveys on weekdays between noon and evening is optimal in their study context. Nevertheless, as the study period advances, these effects gradually diminish. Faught, Whitten, and Green Jr. (2004) demonstrate that Wednesday mornings yield the highest response rates. This finding aligns with the results by Lewis and Hess (2017), who conclude that sending invitations during the early hours of the day is more effective in eliciting responses. We do not uncover such

significant differences in quote continuation among the three predetermined time slots during the day. This implies that communication timing with users may not be as critical within messenger-based chatbot technology. WhatsApp, which enjoys extensive popularity in South Africa, is a platform where users are generally receptive to frequent messages since they can access and read them conveniently. Many users may even appreciate regular contact, as WhatsApp is a platform where people enjoy spending their time and receiving messages is an integral part of the experience.

6.3 Quiz reminder

Examining the effectiveness of incorporating gamified elements into reminders, such as sending quizzes to re-engage with customers, yields diverse insights, as is evident in the literature. According to Müller-Stewens et al. (2017), games can effectively enhance consumers' behavioral outcomes through two psychological forces. First, games stimulate consumers' curiosity about the product, igniting their interest and desire to explore further. Second, gamification drives the perceived vividness of the information transmitted, making the experience more engaging and memorable. By capitalizing on these forces, gamification can provide customers with a more exciting and immersive experience, facilitating effective information processing and retention.

When delving into the fundamental principles of gamification for enhancing customer engagement and digital sales, Eisingerich et al. (2019) underscore the importance of hope. In seeking a desired outcome, hope can serve as a positive stimulus for customer engagement when triggered through gamification elements. Thorpe and Roper (2019) further emphasize that gamification can be a highly effective tool for boosting digital sales, particularly when implemented through mobile applications. While the existing literature on gamification

suggests its potential to increase customer enjoyment, drive engagement, and ultimately lead to higher sales, our results present a different perspective. They support the notion that gamification in the form of a quiz is an effective tool for enhancing overall engagement while the influence on overall sales remains limited. It may be the case that the level of gamification used in this study for the quiz reminder is insufficient to persuade users beyond re-engagement to finalize the purchasing process.

Some studies investigating the effect of incentivized online surveys or questionnaires agree on the positive influence of monetary incentives on increasing the user's response rate (McLeod et al. 2013; Robertson, Walkom, and McGettigan 2015; VanGeest, Johnson, and Welch 2007). Our findings support these insights to the extent that incentivized quizzes have a significantly positive effect on the re-engagement rate of users. However, despite this positive effect on the quote continuation, they do not exceed that of the non-incentivized quiz. Hence, even if the sole objective is to drive re-engagement, it appears that the choice to compensate chatbot users monetarily does not play any role here. This prompts the question whether it is worthwhile to even monetarily incentivize re-engagement in certain parts of the insurance purchasing process. If incentivization merely succeeds in boosting re-engagement without translating into increased sales, it could potentially negatively reflect on the overall financial balance of that company. Further research could expand the effect of different types of incentivization by also looking at non-monetary forms and comparing them to no incentivization at all.

Another interpretation may be that although the likelihood of users re-engaging with the chatbot after receiving a quiz reminder increases, the way the quiz content is delivered may trigger anxiety or death-related thoughts as a funeral cover is connoted rather dark and pessimistic. This aligns with the findings by Du et al. (2020). Hence, it may be interesting to engage in

further research to investigate the impact of such reminders on re-engagement and sales if the content is changed using more optimistic wording.

VII. FINAL REMARKS

This study addresses a critical challenge in chatbot communications: the high customer attrition rate during purchasing. Our research aims to investigate the effectiveness of re-engaging these customers through the chatbot to overcome interruptions. We examine the impact of different daily dispatch times and reminder design on quote continuation and sales transactions. The findings contribute to the broader literature on chatbot interactions and customer engagement. They highlight the complexities of re-engagement strategies and the importance of tailoring them to specific contexts. While reminders prove effective in keeping customers interested, their influence on sales remains limited.

As the financial industry continues to embrace digital solutions, the role of chatbot technology becomes increasingly vital. Conducting additional research to assess strategies for promoting specific products could provide valuable insights into the argument that traditional marketing methods may no longer be adequate in this evolving technological landscape.

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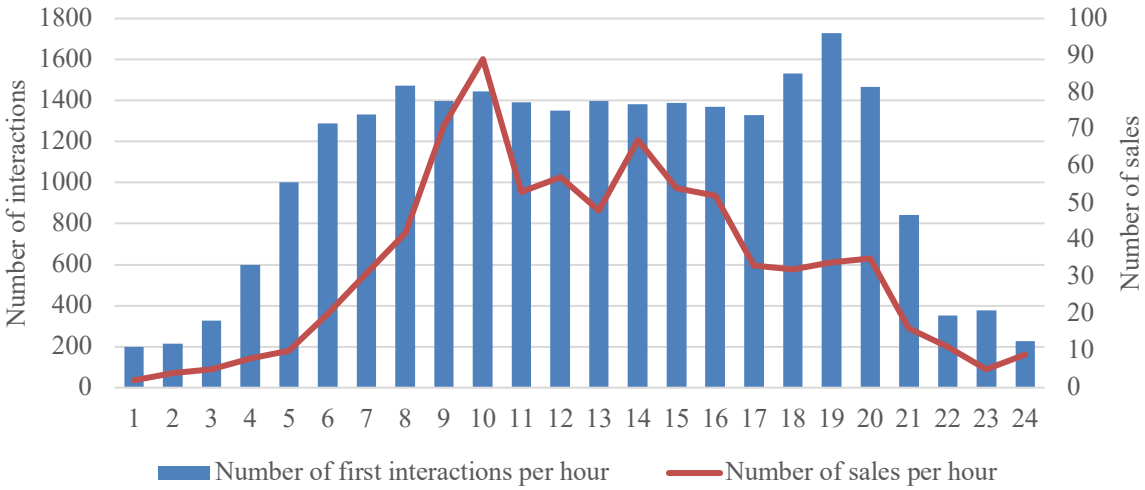
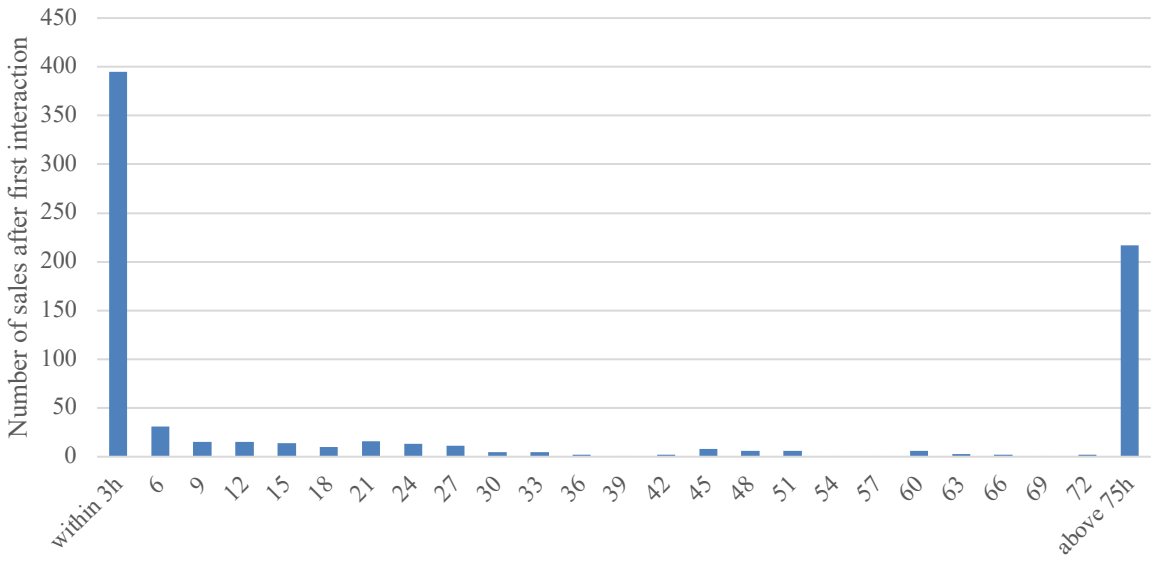
APPENDIX

Figure A.1: Number of first interactions and total sales throughout the day.



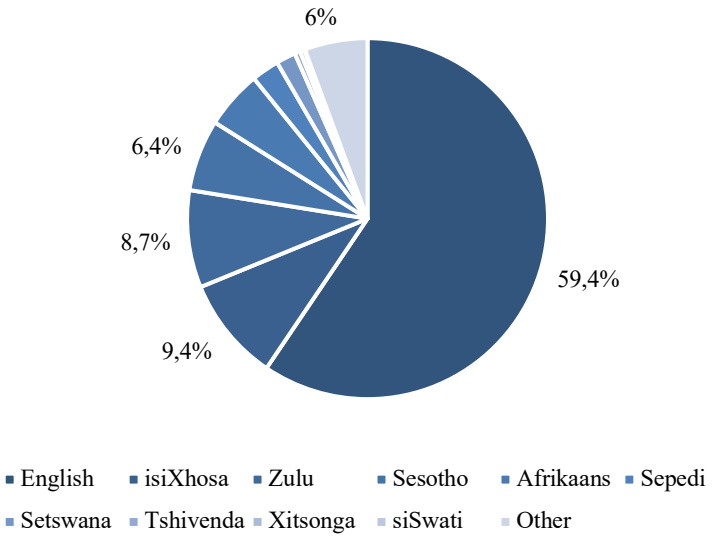
Note: Blue bars represent the number of first interactions during the day. The red line shows sales in absolute numbers. While the first interactions peak between 6 and 7 pm, sales are highest between 9 and 10 am. Source: Internal RatherChat data, based on 25,410 observations.

Figure A.2: Number of sales by hours from the first interaction.



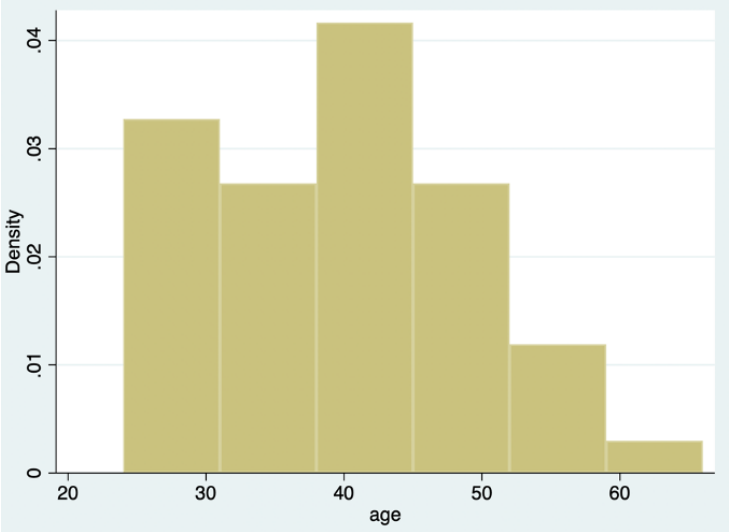
Note: Blue bars represent the number of sales categorized on hours between the first interaction and the actual sales transaction. Sales peak between zero and three hours after the first interaction with chatbot users. Source: Internal RatherChat data, based on 25,410 observations.

Figure A.3: Distribution of languages spoken at home in the overall sample.



Note: English-speaking users represent the majority, followed by isiXhosa and Zulu. Most South African citizens choose English as the common language of communication.

Figure A.4: Distribution of completed sales with respect to age.



Note: The highest density of sales falls within the age of approximately 40 and 45. It decreases with increasing age. Data for age is available for 2,923 observations.

Table A.1: Panel B results of the direct impact of quiz reminder clustered by the time between the end of the initial conversation and the reminder dispatch.

i) Continue Quote

	1) Within 5 hours	Between 5 & 10 hours	Prob > F
Panel A. Direct impact of quiz reminder			
Quiz	0.17	0.18	0.711
	(0.026)***	(0.023)***	
R squared	0.11	0.11	
Observations	1,217	1,453	

	2) Between 5 & 10 hours	Between 10 & 15 hours	Prob > F
Panel A. Direct impact of quiz reminder			
Quiz	0.17	0.137	0.21
	(0.026)***	(0.026)***	
R squared	0.11	0.04	
Observations	1,006	1,535	

	3) Between 10 & 15 hours	After 15 hours	Prob > F
Panel A. Direct impact of quiz reminder			
Quiz	0.17	0.17	0.1
	(0.026)***	(0.021)***	
R squared	0.11	0.11	
Observations	1,217	1,510	

Note: *** p<0.01, ** p<0.05, * p<0.1. Reminders increase the likelihood of quote continuation, independently of the time between the initial conversation ended and the reminder dispatch. The unit of observation is a chatbot user. Panel B.i. shows results for the quiz reminder. Results are compared to Column 1, representing the results for reminders sent within the first five hours. Column 2 shows results for reminders sent between 5 and 10 hours, Column 3 between 10 and 15 hours, and Column 4 after 15 hours. Controls include the difference between the end of initial conversation and receival of reminder, number of members insured under the policy, language spoken at home, and number of children. The robust standard errors are reported in parentheses.

List of Variables:

Stata Variable	Description

cont_quote	Dummy variable indicating whether a chatbot user continued quote (=1) or not (=0)
clicked_cont_quote	Dummy variable indicating whether a chatbot user clicked on 'continue quote' (=1) or not (=0)
sale	Dummy variable indicating whether individual completed a sale (=1) or not (=0)
duration	Duration of interaction after assigned time. If positive, re-engagement has been successful
quiz	Dummy variable indicating whether a chatbot user received any kind of quiz (=1) or not (=0)
incentivized	Dummy variable whether individual received the incentivized quiz (=1) or not (=0)
non_incentivized	Dummy variable whether individual received the non-incentivized quiz (=1) or not (=0)
group	Categorical variable indicating whether a chatbot user is assigned to the control group (=0), the narrative message group (=1), the statistical message group (=2), the incentivized quiz group (=3), or the non-incentivized quiz group (=4)
time	Categorical variable indicating whether a chatbot user is assigned to the morning (=1), the noon (=2), or the evening (=3) group
morning	Dummy variable equal to 1 if user is assigned to morning slot
noon	Dummy variable equal to 1 if user is assigned to noon slot
evening	Dummy variable equal to 1 if user is assigned to evening slot
age	Age of chatbot user (available for 4,379 observations)
language	Categorical variable indicating the language of chatbot user spoken at home: 1 = English; 2 = Afrikaans; 3 = Zulu; 4 = Sepedi; 5 = Sesotho; 6 = Xitsonga; 7 = isiXhosa; 8 = Tshivenda; 9 = Setswana; 10 = siSwati; 11 = isiNdebele; 12 = Other
language_t	Language of chatbot user spoken at home
children	Number of children a chatbot user has
holder_num	Total number of individuals covered by funeral cover policy
pre_time	Time difference (measured in days) between the end of the initial conversation and the assigned time slot
pre_time_hour	Time difference (measured in hours) between the end of the initial conversation and the assigned time slot