

Annotating Customer-Oriented Behaviour in Call Centre Sales Dialogues

Jutta Stock^{1,2}, Dietrich Klakow², Volha Petukhova²

¹DPV Deutscher Pressevertrieb GmbH, Hamburg, Germany

²Saarland University, Spoken Language Systems, Saarbrücken, Germany

jutta.stock@rtl.de; {dietrich.klakow,v.petukhova}@lsv.uni-saarland.de

Abstract

Customer-oriented behaviour (COB) plays an important role in call centre interactions, particularly in the context of successful sales negotiation. However, the evaluation of COB in customer-agent conversations often lacks clarity in its definition and robust computational assessment methods. This paper addresses these challenges by presenting a comprehensive conceptual and empirical framework. We conducted multidimensional dialogue act annotations of authentic call centre interactions using the ISO 24617-2 taxonomy, capturing the multifaceted nature of these interactions. This process led to the identification of relevant dialogue act categories, proposed extensions concerning relationship-building aspects, and derived corpus statistics. The findings highlight specific facets of COB that positively impact Customer Satisfaction (CS), as determined through correlation analysis. Additionally, we delved into the dependencies between COB and feedback acts, leveraging the hierarchical structure of the DIT++ model. This framework improves our understanding of the dynamics shaping sales strategies in call centres and holds promise for practical applications in optimising customer-agent interactions.

Keywords: dialogue act annotations, customer-oriented behaviour, call centre dialogues, ISO 24617-2

1. Introduction

Frontline call centre agents perform a diverse range of tasks, including handling customer inquiries with precision, discerning and addressing customer needs, engaging in sales negotiations, and managing call efficiency (Average Handling Time, AHT). The transparency of successful communication is of outstanding importance, representing a valuable asset that not only supports Customer Satisfaction (CS), but also fosters brand loyalty and facilitates up- and cross-selling initiatives.

However, the importance of COB (Customer-Oriented Behaviour) is often hindered by a lack of theoretical clarity concerning its precise definition (Brady and Cronin Jr, 2001) and the absence of robust analytical, categorization, and computational approaches. To comprehend the dynamics of goals, strategies and processing steps in sales negotiations during call centre interactions, it is imperative to model dialogue acts, accounting for pragmatic and semantic phenomena.

Thus, we have formulated the following primary research objectives and corresponding experimental steps:

1. Comprehensive understanding of COB: our initial objective is to attain a comprehensive understanding of COB by specifying a set of dialogue acts and conducting multidimensional dialogue annotations using the ISO 24617-2 taxonomy. We also address gaps in relationship-building aspects through necessary extensions.

2. Identification of influential COB facets: subsequently, we aim to identify the facets of COB that positively influence customer-perceived service quality by correlating COB annotations with customer ratings.
3. Fine-grained analysis of the sales phase: In a more detailed analysis of the sales phase, we investigate various pragmatic phenomena and discourse dependencies to enhance our understanding of the dynamics of sales negotiation.

This exploration will shed light on both strong and weak communicative and sales negotiation strategies. We aim to provide deeper insights into the mechanisms that underlie effective communication and sales negotiation strategies. The annotated corpus comprises real-world call centre conversations from a German publishing house. The telephone conversations within our corpus were conducted in German. Systematic and comprehensive dialogue act analysis and dialogue modelling with ISO 24617-2 are frequently employed to gain insights into human interactive behaviour. Annotation schemes enable empirical exploration of interactive and task-oriented phenomena, while also providing a data-driven foundation for designing and constructing interactive systems. The automation of services within the domain of call centre conversations has garnered substantial attention, particularly in the context of AI chatbots. The remainder of this paper is organized as follows. Section 2 provides related work about COB. Section 3 describes the framework of the ISO

24617-2 dialogue act taxonomy and discusses required extensions. Section 4.1 outlines the corpus data and the annotation procedure in section 4.2. 4.3 deals with an exploration of effects of COB on service quality. Section 4.4 delves into sales strategies and feedback mechanisms. We conclude with a combined discussion and conclusion in section 5.

2. Background and Related Work

Customer-centricity is a central component in modern marketing. Customer Oriented Behaviour can be defined as a set of behaviours, actions, and attitudes that businesses as well as employees exhibit to meet customers' needs and expectations¹. In call centre environments, it should be noted that distinct approaches often coexist, characterised by high goal conflicts (Marr and Neely, 2004). Firstly, the *production line* approach prioritises handling a high volume of calls with a focus on quantitative performance metrics, e.g., Average Handle Time (AHT), calls handled, and abandonment rates. They primarily measure efficiency and directly impact financial performance. Secondly, the *customer-orientation* approach focuses on delivering service quality and relationship building by supporting and helping customers (Gilmore and Moreland, 2000; Marr and Neely, 2004). Blending service and sales adds complexity, (Jasmand et al., 2012), as different behaviours (e.g., reliably conducting a request to explore customer needs) are required. According to the call centre literature on customer-oriented agent behaviour (De Ruyter and Wetzels, 2000; Parasuraman et al., 1991; Burgers et al., 2000; Zeithaml, 1988; Bitner, 1990), relevant aspects are:

- *Responsiveness*: the willingness to help customers and provide prompt service.
- *Reliability*: the ability to perform the promised services accurately.
- *Explanation*: clarity, truth and honesty when providing content and explanations to the customer.
- *Adaptability*: the ability to adjust behaviour and handle interpersonal situations (Pulakos et al., 2000).
- *Empathy* is considered vital - broadly defined as the ability to understand another person's perspective and react accordingly (Davis, 1983).

¹<https://cmr.berkeley.edu/2021/09/what-is-customer-centricity-and-why-does-it-matter>

- *Personal initiative (PI)*(Freese and Fay, 2001) and proactive work behaviour are also relevant.

Furthermore customer-orientation is an essential prerequisite for a successful sales approach; the salesperson needs to fundamentally understand the customer's feelings and thoughts (Stock and Hoyer, 2005), providing information rather than asserting pressure (Donavan et al., 2004) and to satisfy their needs adequately (Saxe and Weitz, 1982).

2.1. Analysing Customer-Oriented Behaviour

The existing literature on the linguistic analysis of COB phenomena and its association with customer satisfaction (CS) covers a wide range of approaches. Studies range from the investigation of linguistic clues in services and related CS (Fan et al., 2023) to predictions of CS based using machine learning and fuzzy linguistic as well as natural-language processing methods (Abdullah and Khadijah, 2011; Sudarsan and Kumar, 2019). Additionally, deeper insights into the relationship between COB and CS have been explored through argumentative analysis, relating to preexisting COB indicators (Pallotta and Delmonte, 2013). Furthermore, the exploration of linguistic, prosodic and conversational information of CS prediction is relevant in this context (Luque et al., 2017), which utilizes a Deep Convolutional Neural Network (CNN) based Natural Language Processing (NLP) approach to fuse linguistic and prosodic information at the feature level.

3. Semantic Framework of the ISO 24617-2 Dialogue Act Taxonomy

The ISO 24617-2 (Second Edition, ISO 2020) serves as a powerful instrument for the analysis and assessment of sales negotiation and behaviour applied by call centre agents, as already found in (Stock et al., 2022). It presents a semantic framework encompassing a multidimensional multimodal view on dialogue and offers a rich inventory of dialogue act tags (Bunt et al., 2010a, 2017; Bunt, 2019). The communicative activities are called *dialogue acts* and have two components: a *semantic content*, which corresponds to what the utterance is about and a *communicative function*, which specifies how the addressee updates their information state, resulting in multi-layered annotations.

The ISO 24617-2 taxonomy distinguishes nine dimensions addressing information regarding tasks (*Task Management*), feedback on communicative behaviour (*Auto-Feedback* (speaker)) or (*Allo-Feedback* (other participant)), needing time to

continue the dialogue (*Time Management*), managing the next turn (*Turn Management*), the way the speaker is planning to structure the dialogue (*Dialogue Structuring*), and information about social conventions (*Social Obligations Management*) (Petukhova and Bunt, 2020).

The ISO 24617-2 annotation scheme is designed to be universally applicable, meaning that its defined dimensions and communicative functions can be used across various types of dialogues, regardless of the specific task domain. However, the standard is also open allowing for the inclusion of new concepts through extensions (Bunt, 2019).

Stock et al. (2022) have previously identified that modelling the aspects of relationship-building in call centre conversation requires extensions, as these components are prerequisite for successful customer interaction. We therefore incorporated *rhetorical relations* defined in the ISO 24617-8 standard and *sentiment qualifier* from ISO 24617-2.

In the field of *rhetorical relations*, ISO 24617-2 does not prescribe a definitive selection of relations for use (Bunt et al., 2020). Rather, it provides a framework for the integration of the ISO 24617-8 standard, which refers to the annotation of discourse relations into the annotation scheme for dialogue acts. Bunt et al. (2017) explain that the annotation of *rhetorical relations* is optional and serves to explain the causal or motivational link between one dialogue act and the subsequent performance of another. The scientific field of discourse relations, also referred to as *coherence* or *rhetorical relations*, comprises extensive research (Prasad and Bunt, 2015). The present research utilised the categories for *rhetorical relations* defined in the ISO 24617-8 taxonomy, focusing on those categories relevant to the specific use cases within the designated domain.

Using the ISO 24617-2, *sentiment qualifiers* can be attached to communicative functions, modifying/strengthening its force. Sender's attitudes can be expressed towards other participants and towards the utterance content. Applying *sentiment qualifier* as an open category brings flexibility to the description of various domain specific phenomena, which is advantageous. To model aspects of COB, we incorporated positive *sentiment qualifier* which may be highly relevant for the agents communicative strategies.

The ISO standard has been successfully applied to analyse and model interactive games (Petukhova et al., 2014), multi-issue bargaining dialogues (Petukhova et al., 2016), and, with the support of additional specific types of communicative action, medical consultations (Petukhova and Bunt, 2020).

4. Annotation Experiments

In the following sections, we present three experiments. Firstly, we evaluate the ISO 24617-2 standard's ability to annotate various facets of COB. We analyse 67 call centre dialogues, emphasising COB-related aspects and discussing potential extensions. In the subsequent phase, we establish correlations between annotated customer service dialogues and customer ratings. Our focus is to determine if specific COB facets are linked to excellent customer ratings. In the context of our primary research theme, i.e., sales strategies, we aim to explore the dynamics between COB and successful sales interactions, using a pragmatic deep-analysis approach.

4.1. Corpus Data

The analysed corpus comprises authentic call centre conversations from a German publishing house, involving magazine subscribers seeking assistance with various issues, e.g., orders, address changes, delivery concerns, and subscription cancellations. We deliberately selected conversations featuring diverse, experienced agents displaying comprehensive COB and sales strategies, aided by the VONAGE² speech analysis software. The final corpus includes 67 call centre interactions, totalling 4.3 hours. It encompasses audio recordings, transcripts, and additional metadata like agent IDs, talk times, timestamps per turn, and customer ratings on a scale from one (excellent) to five (poor). Speech signals from the audio recordings were automatically transcribed and verified manually.

The analysed dialogues were exclusively conducted in German. While the scope of this study does not extend to detailed examinations of German language and culture, it is important to highlight that the annotation process was conducted by native speakers. Therefore, we can assert the reliability and validity of our findings within the context of this linguistic framework, based on the methodologies employed and the data analysed.

4.2. Modelling Customer Oriented Behaviour

The literature review on COB in call centre communication reveals the multifaceted nature of this activity. Call centre agents must skilfully juggle multiple tasks concurrently. This includes managing the dialogue's flow, providing and eliciting feedback, proactively managing their time, all while nurturing trust and relationships and pursuing sales objectives. In our annotation experiment, we divided 67 customer service dialogues into 3.054 segments and manually assigned 3.994

²www.vonage.com

communicative functions to the various dimensions outlined in ISO 24617-2 in order to capture the COB indicator. Our perspective highlights the importance of the following dimensions and communicative functions in modelling this behaviour.

In the *Task dimension*, activities encompass various tasks related to *information-seeking*, such as the use of question tags to address customer concerns, needs, and requirements. Agents continue by *providing information*, which includes conveying *agreement* or *disagreement*, offering details about contract data, and presenting sales offers. This dimension also covers *commissive functions*, where speakers commit to specific actions such as making *offers*, *promises*, and *accepting requests*. Additionally, *directive functions* are involved, including *requests* and *suggestions*.

Furthermore, call centre agents must structure conversations to optimise efficiency. These aspects are assessed within the *Turn management* dimension, which includes functions like *turnAssign* and *turnAccept*. *TurnTake* and *turnGrab* functions are particularly noteworthy, as they reflect agents' efforts to manage overly talkative customers and ensure the conversation's efficiency. *Time management* functions, such as *stalling* and *pausing*, are significant for maintaining the conversational flow and preventing unfilled pauses that can irritate customers during call centre interactions.

The *Discourse Structuring* dimension is relevant in assessing COB. It involves creating a coherent dialogue with well-defined *openings*, *closings* and smooth transitions between *topics*. Within the *Social Obligations Management* dimension, functions like *apologizing* and *thanking* play a crucial role. *Greeting* and *replying*, as well as *self-introduction* and *replying*, are a standard in service dialogues but do not necessarily indicate a dedication to customer orientation.

In the evaluation of Customer-Oriented Behaviour (COB), the development of the customer-agent relationship is highly significant, primarily facilitated through the agent's display of empathy, transparency, articulate explanations, and adaptive behaviour. Empathy ensures understanding and connection, transparency builds trust, clear explanations aid in customer comprehension, and adaptive behaviour allows for personalised service. These elements are crucial as they directly impact the interaction's effectiveness, influencing customer satisfaction and loyalty.

To assess relationship-building aspects, we also incorporated *sentiment qualifiers* and *rhetorical relations* into our annotations. A detailed specification of the tags can be found in the following section on in-depth analysis 4.4.4 and 4.4.5.

Table 1 presents the relevant dimensions and

communicative functions including illustrative examples from the analysed conversations .

Table 2 presents the frequency distribution of all annotated communicative functions across dimensions.

Notably, the *Task* and *Turn Management* dimensions account for a high proportion of total annotations, indicative of a focused, task-oriented exchange between the agent and the client. The significant presence of relationship-building elements, accounting for 33.1% of the total, can be attributed to the previously mentioned selection criteria for customer service calls. These calls specifically involve experienced agents and encompass comprehensive facets of COB. As expected, with the exception in the *Social Obligations Management* dimension, the majority of communicative functions are primarily performed by the agent.

4.3. Effects of COB on the perceived Service Quality

In the following phase, we examine the correlation between annotated COB indicators and customer-perceived service quality, driven by the hypothesis that COB positively influences this aspect. Post-call surveys were conducted using automated IVR (Interactive Voice Response) systems, where customers rated the service's quality on a scale ranging from 1 (excellent) to 5 (poor). The examined call centre conversations typically received favourable ratings, ranging between 1 and 3. Several factors may contribute to these ratings. Agents often avoided soliciting feedback in escalated or negative conversations, fearing consequences from superiors following unfavourable evaluations. Additionally, customers tend to provide more positive feedback, motivated by politeness. Due to the limited dataset of 67 conversations and a small variance, we categorised the ratings into two groups, following a methodology consistent with (Rafaelli et al., 2008): 52 conversations received a rating of 1 (excellent), while 15 received a rating greater than 1.

Our goal was to find significant effects on the customer rating (dichotomous variable) relating to the COB indicators (metric variables). In the first experiment we assigned dialogue acts (i.e. <dimension; communicative function>) for each segment. Service quality scores were computed for the entire call/dialogue and not for each segment. We normalized the number of communicative functions per dimension with the talk time per call and calculated a Mann-Whitney-U test, see Table 3.

It is noteworthy that sentiment qualifiers, across all dimensions and communicative functions, exhibit a measurable impact on customer evaluations. Further examination focused on the signif-

Dimension	Dimension-specific communicative function	Illustrative examples
Task Management		
<i>Information-Seeking</i>	propositional-Question set-Question check-Question choice-Question	<i>do you have any further questions</i> <i>may I ask how old you are</i> <i>did I understand you correctly</i> <i>would you prefer the half-year or yearly offer</i>
Information-Providing	inform agreement confirm	<i>the offer includes 2 free copies</i> <i>it doesn't make sense if the subscription continues</i> <i>I am canceling the subscription as per your request</i>
Commissives	answer offer promise	<i>yes, the subscription ends in 3 months</i> <i>in this case, I'll look up the order using your name</i> <i>you will receive a confirmation within 24 hours</i>
Directives	accept request suggest	<i>we are pleased to do that</i> <i>can you give me your client number, please</i> <i>I can also arrange to have the magazine sent to you again</i>
Turn Management	turnAssign, -Accept, -Take, Grab	depends on the individual situation
Time Management	stalling, pausing opening	<i>I will be right with you, the system needs a second</i> domain-specific greeting
Discourse Structuring	closing topicShift	<i>thank you for calling</i> <i>may I ask you a question</i>
Social Obligations Management	apology thanking	<i>sorry for the delay</i> <i>thank you</i>
Rhetorical Relation	recommendation	<i>This magazine is very popular with children</i>
Sentiment Qualifier	explanation happy regretful	<i>Yes, you will receive a written confirmation from me</i> <i>Yes, super! Thank you for ordering the magazine</i> <i>It's a pity that you're cancelling, but I can understand you</i>

Table 1: Dimension-specific communicative functions and illustrative examples in the domain of call centre conversations.

Dimension	Functional segments (in%)		
	All	from those	
		Company	Customer
Task Management	30.9	72.0	28.0
Turn Management	18.6	76.5	23.5
Time Management	4.0	97.5	2.5
Discourse Structuring	6.9	93.8	6.2
Social Obligations Man.	6.5	55.0	45.0
Rhetorical Relation	16.6	61.8	38.2
Qualifier	16.5	75.3	24.7

Table 2: Distribution of functional segments across dimensions produced by the Customer and Company, in terms of relative frequency (in %).

icance of positive sentiment qualifiers, revealing three qualifiers with a notable influence on customer ratings: *cordial* ($p=0.04$), *helpful* ($p=0.07$), and *polite* ($p=0.03$). While acknowledging the limitations of our small dataset and limited rating differentiation, our results suggest that aspects related to customer-agent relationship-building have the most substantial impact on achieving an excellent customer rating.

4.4. Deep Analysis of Sales Strategies

Our preliminary findings suggest that relationship-building aspects hold substantial importance for customers. Subsequently, we conducted an in-depth analysis of the impact of these relationship-building factors on the flexible adaptation of the sales strategy.

In the context of call centre sales interactions, agents are required to be highly precise and strategic. This entails accurate comprehension of customer needs, efficient communication of product

features, and clear presentation of pricing structures. These dialogues are typically dynamic, characterised by continuous adjustments in agent strategies based on customer feedback. To comprehend the dialogue dynamics and the agent's sales negotiation strategy, we must closely analyse feedback acts. These should be examined with respect to the following key aspects: (1) participant comprehension: evaluating whether the person understood the preceding utterance correctly; (2) customer interest: determining if the customer is displaying interest in the presented offer; (3) desire for further information: assessing if the client is expressing interest in obtaining additional details about the offer; (4) addressing uncertainty: identifying strategies employed by the agent to persuade the customer when uncertainty and/or hesitation are detected, including providing more information or rephrasing; and (5) negative reaction: recognising any negative reactions from the customer, prompting potential adjustments by the agent to prevent customer irritation. To understand the unfolding of the dialogue and the agent's sales negotiation strategy, feedback acts must be examined in detail.

Feedback can be described as the mortar of conversation, as it serves the purpose of continually exchanging information among dialogue participants (Bunt, 2012). This fundamental role of feedback is crucial for effective communication (Petukhova, 2011). Achieving success in call centre conversations involves two distinct yet interconnected goals: firstly, the successful processing of utterances from a pragmatic point of view (Allwood and Cerrato, 2003), as feedback strategies

<i>Dimension</i>	<i>MV Rating 1</i>	<i>MV Rating >1</i>	<i>SD Rating 1</i>	<i>SD Rating >1</i>	<i>test statistics</i>	<i>p</i>
Discourse Structuring	0.0199	0.0152	0.0091	0.0058	-1.482	0.138
Social Obligations Man.	0.0108	0.0099	0.0089	0.0060	-0.181	0.856
Task Management	0.0640	0.0572	0.0232	0.0224	-1.094	0.274
Time Management	0.0097	0.0103	0.0073	0.0082	0.166	0.868
Turn Management	0.0418	0.0393	0.0167	0.0170	-0.196	0.845
Qualifier	0.0364	0.0213	0.0205	0.0096	-2.677	0.007
Rhetorical Relation	0.0260	0.0188	0.0159	0.0113	-1.700	0.89

Table 3: Results Mann-Whitney-U Test (MV: Mean Value, SD: Standard Deviation).

are used in a *cooperative way* of exchanging information regarding the communication's success. Secondly, there is the establishment of satisfactory and meaningful interaction with the customer. Additionally, in the dialogues analysed, success also encompasses the achievement of a productive sales closure.

In particular, the investigation addresses the following research questions:

1. Function and Categorisation: what are the functions and purposes of customer and agent feedback acts in the context of sales negotiations? How can these feedback acts be systematically assessed and categorised using pragmatic concepts?
2. Relationship with COB: how do feedback acts relate to COB within sales negotiations? Which strategic intentions support these relationships?

4.4.1. Corpus Data Sales Dialogues

To perform an in-depth analysis, we have selected call centre sales conversations that feature complex sales negotiations. These calls encompass instances where multiple offers (e.g. special offers with vouchers or discounts, alternative magazines on the same subject or digital versus printed versions) are provided during a single conversation, evoking varied customer reactions. Our dataset comprises a subset of ten conversations, which have been meticulously segmented. The dialogues under examination generally follow a consistent structure, including (1) the opening and farewell, (2) customer identification, (3) the customer's request, (4) the agent's sales approach, and (5) a Customer Satisfaction (CS) survey query. Our exclusive focus lies on analysing sales negotiation behaviour, which involves the examination of dialogue acts during the sales phase. This phase begins with the agent seeking information, such as reasons for cancellation or inquiries about the customer's specific interests. These dialogue segments typically entail multiple exchanges, with customer reactions ranging from hesitance to interest or expressions of doubt.

4.4.2. Annotations

In our subsequent analysis, we investigate feedback acts and their correlation with COB annotations. Our goal is to derive strategic insights into the agents' sales behaviour. To achieve this, we concentrate on specific dimensions within the ISO 24617-2 framework, *Task*, *auto- and allo-Feedback*, as well as the accompanying annotations in the *qualifiers* and *rhetorical relations*, representing indicators of COB. The analysis of segments and word distribution during the sales phase reveals a notable discrepancy: although both participants exhibit a similar number of the 3.492 segments (customer 44.3%, agent 55.7%), the agent produces nearly twice the amount of words (2.465, 70.6%) compared to the customer (1.027 / 29.4%). This can be attributed to the agent's active engagement during the sales phase, characterised by a proactive needs assessment and product explanations. In contrast, customers are typically faced with sales offers unexpectedly, following their initial service request.

It can be observed that a majority occur as backchannel acts (Yngve, 1970), expressed by short morphemes like "hmhm" and "ja", as evidenced by the average segment length of only seven words. Backchannel acts, as noted by Ward and Tsukahara (2000), (i) directly respond to the content of the other participant's utterance, (ii) are optional, and (iii) do not require acknowledgment from the other participant. These findings support our hypothesis that analysing feedback-related acts can provide valuable insights into the underlying sales strategies.

Table 4 displays an overview of the dimensions relevant to this use case. The analysis shows that a majority of the functional segments belongs to the *Task* dimension, in which the agent produces twice as many tasks as the customer, expressing a focused exchange.

The *Task* dimension's annotations can be further differentiated in *information-seeking* functions (15.6%), *commissives* (2.1%), *directives* (23.9%), and *information-providing* functions (58.5%). The discussion about products, possible alternatives, prices, additional vouchers and customers' needs is expressed here.

As anticipated, the annotations of *qualifiers* and

Dimensions	All (in %)	Customer	Company	TaskDimension	All (in %)
Task	44.3	36.2	63.8	Information-seeking (check-, propositional-, set-Questions)	15.6
autoFeedback	21.8	65.0	35.0	Commissives (offer, promise)	2.1
alloFeedback	2.1	64.3	35.7	Directives (request, suggest)	23.9
RhetoricalRelations	20.5	21.6	78.4	Information-providing (answer, confirm, accept-/decline-Offer)	58.5
Qualifier	11.3	39.2	60.8		

Table 4: Distribution of functional segments (All in (%)) across feedback dimensions (Auto-, Allo-Feedback) and additional COB indicator (qualifier, rhetorical relations); distribution within the Task dimension.

rhetorical relations predominantly manifest on the agent's side, whereas the majority of feedback acts are observed on the customer's side.

4.4.3. Feedback Behaviour

This section explains our approach to annotating communicative functions related to feedback utterances, taking into account various discourse phenomena. Concerning the definition of the term "feedback utterance", we follow Bunt (Bunt, 1994) "Feedback is the phenomenon that a dialogue participant provides information about his processing of the partner's previous utterances. This includes information about perceptual processing, about interpretation, about evaluation (agreement, disbelief, surprise,...) and about dispatch (fulfilment of a request,...)."

Concerned with multimodal annotation constraints, Allwood et al. (1992) use a framework wherein feedback analysis is split into four basic communicative functions: 1) contact, 2) perception 3) understanding 4) attitudinal reactions.

The ISO 24617-2 takes into consideration the feedback aspects of *polarity* (positive / negative) and *direction* (giving / eliciting). It provides two dimensions, first distinguished by Bunt (1999).

Auto-Feedback refers to the feedback on the speaker's own processing. *Allo-Feedback* means feedback on someone else's procession, including feedback elicitations like "okay?" or "right?". Both dimensions can have *positive* and *negative* functions.

Positive feedback means that the utterance(s) in question have been processed with sufficient success, whereas *negative feedback* means that a clarification or correction is required.

Responsive acts, i.e. all types of answers, acceptance and rejection, entail implicit *positive Auto-Feedback*. Adhering to the guidelines of the ISO 24617-2 standard (Bunt, 2019), we avoided redundancies and only annotated *Auto-* and *Allo-Feedback* acts that are expressed as short morphemes (e.g. "yes", "hmm") and involve a high degree of context dependence.

In the studied sales dialogues, there were, save a few exceptions, no situations where a lack of understanding regarding the context or a disturbance was expressed between the interlocutors. Thus,

there was no need for annotating *negative allo- or auto-Feedback* acts. This can be explained by the fact that the *cooperative principle* (Davies, 2000) is particularly evident in call centre conversations, where the participants are highly focused and intent on achieving their communicative goals, which requires clear communicating from both sides.

Hadi et al. (2013) mentions Grice's work, i.e. that participants essentially tend to cooperate during a verbal exchange in order to construct meaningful conversations. Furthermore, (Allwood and Cerrato, 2003) found that feedback strategies are used as a cooperative way of exchanging information about the successfulness of communication. The analysis of *allo-Feedback* annotations has helped to provide insights into feedback behaviour in the context of sales approach, even if the share of 2.1% of the total annotations is rather small. The next example shows how a customer implicitly signals uncertainty and simultaneously elicits more information:

(1) **Company:** I don't know if you already know this magazine?

Customer: Hmm... no. <*alloFeedback*>

As for the *auto-Feedback* dimension, our results suggest that it does not have the granularity to adequately annotate the analysed conversations.

To conduct an in-depth analysis of the feedback mechanisms that are important for this use case, we refer to the DIT framework. The DIT++(Dynamic Interpretation Theory) taxonomy (Bunt, 2012), which forms the basis for the ISO 24617-2 standard. It distinguishes five levels of processing in a logical order that follows the information-state update approach. The lowest feedback-level of *attention*, e.g. applied to utterances like "sorry - what were you saying", could not be identified in the studied conversations. This can be explained by the intention of precise and targeted communication between agent and customer. The usefulness of the remaining four levels lies in their ability to annotate feedback acts in their respective contexts and the intentions associated with them, as the following illustrations show:

(2) **Company:** You can terminate the offer after half a year.

Feedback Level	All (in%)	Customer	Company
perception	13.3	63.2	36.8
interpreting	39.8	64.9	35.1
evaluation	38.5	61.8	38.2
execution	8.4	83.3	16.7

Table 5: Level-specific feedback acts (in %) according to the DIT++.

Customer: Hmhm.

<auto-Feedback: *perception*

- (3) **Company:** So the next edition of the magazine is published on xxx.

Customer: Yes, ok.

<auto-Feedback: *interpretation/understanding*

- (4) **Company:** You would then immediately start with edition x and I would transfer the credit balance.

Customer: Yes, super

<Qualifier: *happy*; auto-Feedback: *evaluation*

- (5) **Company:** The offer would include three free copies and a voucher.

Customer: Yes, then we do it like this.

<auto-Feedback: *execution*

When analysing sales conversations, it became apparent that the interpretation of customer feedback acts in sales negotiations is particularly dependent on intonation. Customer feedback of “hmhm” to the previous utterance “We are pleased to be able to make you a favourable offer” can be interpreted as the level of *perception*. If the voice rises, it can be understood as an *evaluation* i.e. as an utterance that is signalling interest in further information.

As expected, the distribution of feedback acts based on the DIT levels, see Table 5, predominantly favours the customer’s side. *Execution* acts are mostly evident towards the end of the sales phase, coinciding with the moment when the customer expresses readiness to accept an offer and confirms their acceptance with e.g. “yes” or “good”.

Furthermore, it is of interest to observe that feedback acts uttered by the agent also encompass distinct levels. For instance, the agent primarily exhibits indications of active listening at the *perception* and *interpretation* levels, while at the *evaluation* level, they convey assurance to the customer through phrases such as “that’s right”, “exactly”, or “we can proceed in that manner”.

In this section we have explored feedback acts in the *auto- and allo-Feedback* dimension. Our empirical analysis highlights the need for a fine-grained approach when addressing various aspects within the auto-Feedback dimension, in order to properly interpret feedback in the context of sales negotiations. Despite the decision made by

Qualifier Type	All (in %)	Customer	Company
amused	7.2	20.0	80.0
cordial	4.3	33.3	67.7
friendly	2.9	0.0	100.0
happy	26.1	77.8	22.2
joking	4.3	66.7	33.3
personal	11.6	12.5	87.5
pleased	8.7	66.7	33.3
polite	26.1	5.6	94.4
regretful	5.8	0.0	100.0
satisfied	2.9	50.0	50.0

Table 6: Distribution of sentiment qualifier produced by the Customer and Company, in terms of relative frequency (in %).

the ISO 24617-2 designers to collapse the level-specific approach, as noted in (Bunt, 2012), we perceive the use of the DIT level as an opportunity for a comprehensive and thorough examination of feedback acts in sales negotiations.

4.4.4. Sentiment Qualifiers

In the context of sales negotiation, relationship-building aspects are particularly challenging for call centre agents. In the analysed dialogues, customers typically do not expect to receive sales offers following the resolution of their service requests. Thus, such sales offers tend to elicit surprise. Remote communication modalities, such as telephone interactions, often lack the non-verbal cues and contextual information available during face-to-face encounters, leading to increased uncertainty and caution in decision-making. The issue of unfamiliarity between the agent and customer adds another level of complexity to the sales process. Concepts of Emotional Intelligence (EI) (Brown, 2014) and adaptive selling behaviour (Weitz et al., 1986) are related to sales performance (Wisker and Poulis, 2015).

To model these aspects of communicative behaviour, we incorporated *sentiment qualifiers* into our annotations. The distribution in Table 6 shows that a wide variety of emotions/attitudes is expressed.

Regarding politeness tags, it should be mentioned that there are many different approaches to defining and analysing linguistic politeness (Brown, 2013). We are guided by the following indications: positive politeness strategy entails claiming common ground (Brown and Levinson, 1987), seeking agreement, and avoiding disagreement (Cutting, 2005) as the following example may illustrate: “If you wish, WE can terminate your subscription to immediately”. The agent emphasises that they are responding to the client’s request by paraphrasing it and using the pronoun “we”.

It is noticeable that *happy*, *joking*, *amused*, and *satisfied* occur primarily at the end of the sales phase, indicating the culmination of a successful

Rhetorical Relation	All (in %)	Customer	Company
explanation	38.3	6.5	93.5
restatement	33.3	45.0	55.0
elaboration	17.5	9.5	90.5
cause	10.8	30.8	69.2

Table 7: Top four most frequent rhetorical relations (in %).

conversation, either in the form of a sales conclusion or as an indicator of effective relationship building. *Regretful* tags are directly associated with the customer's request for termination of magazine subscription, articulated by the agent as "we regret this very much". From a sales strategy perspective, this situation also serves as an anchor for the beginning of the sales phase.

4.4.5. Rhetorical Relations

As previously indicated, we incorporated *rhetorical relations* defined in the ISO 24617-8 into our annotations in order to express how one dialogue act motivates the performance of another (Bunt et al., 2017). In this section, we explore how *rhetorical relations* support sales strategies and interact with feedback mechanisms. Among the applied categories of *rhetorical relations*, namely *explanation*, *restatement*, *elaboration* and *cause*, the most frequent occurrences are observed. However, it is notable that only in the case of *restatement* the distribution is nearly equal, with the customer contributing 45% and the agent 55%. In all other categories, the predominant contribution comes from the agent.

These annotations are relevant in the context of sales negotiations and encompass activities such as explaining offers, extending proposals and reformulating price advantages. This means that they are attached to annotations in the *task dimension* such as *offer*, *suggest*, *inform*, *confirm*. It is interesting to observe how feedback acts motivate the performance of the next dialogue act, including a *rhetorical relation*, as the next dialogue section will illustrate:

- (6) **Company:** And the next possibility is that I check if I can find a nice discount offer that we have right now for the magazine.

<Task:suggest; RhetoricalRelations: elaboration, DiscourseStructuring: TopicShift >

Customer: Hmhm <autoFeedback: perception>

Company: And you can save a lot of money.

<Task:inform; RhetoricalRelations: restatement >

Customer: Hmhm <autoFeedback: perception>

Company: So I could also offer that, just for your information.

<Task:suggest; RhetoricalRelations: restatement>

Here we can see how *rhetorical relations* connect strategic steps of sales negotiation behaviour,

and how these dialogue acts are elicited from the customer's feedback. Due to the somewhat vague feedback from the customer at the *perception* level, the agent proactively continues the sales approach.

5. Discussion and Conclusion

The primary objective of this paper was to assess the influence of COB on the effectiveness of sales negotiation strategies within the domain of call centres. To address the complexities of call centre sales negotiations, we adopted the ISO 24617-2 dialogue act taxonomy, allowing us to capture the multidimensional and multimodal facets of COB comprehensively. In this context, we identified relevant dimensions and communicative functions. We also established domain-specific extensions within the *sentiment qualifier* and *rhetorical relations* categories to model critical social and interpersonal elements. Our investigation delved into the correlation between COB annotations and customer ratings, revealing that aspects related to relationship-building exhibit a positive impact on customer ratings. Subsequently, we employed a deep-analysis approach to examine these interpersonal facets in the context of feedback acts during the sales phase. In particular, the feedback levels based on the DIT++ framework proved to be beneficial for this analysis.

The use of multidimensional annotations aligned with the ISO 24617-2 dialogue act taxonomy has proven to be effective in capturing the complex and multi-layered nature of customer-oriented behaviour (COB) in call centre dialogues. The integration of *rhetorical relations* and *sentiment qualifiers* proves to be a critical foundation that expands the taxonomy's analytical possibilities. Furthermore, the study of feedback acts highlights the value of considering the multi-layered structure of the DIT++ model, which allows for the capture of nuanced elements that are critical to analysing sales strategy methods. However, this study encounters a limitation due to the linguistic scope of the dialogues analysed, which are exclusively in German. This peculiarity harbours the possibility that COB and feedback behaviour may manifest themselves differently in different languages. In addition, the analysed dialogues originate from a specific context, namely incoming service calls followed by a sales negotiation. This context may not fully represent the dynamics observed in direct face-to-face sales interactions or in outbound sales-oriented telephone conversations. Our future research aims to delve deeper into the drivers of successful sales negotiations, e.g., politeness strategies and persuasiveness. In the follow-up annotation experiments, trained and (domain) expert annotators will be involved.

Acknowledgments

The authors are very thankful to anonymous reviewers for their valuable comments.

6. Ethics Statement

In accordance with data protection regulations and laws, strict measures were taken into account regarding the sensitive nature of personal data in call centre conversations. Prior consent to record conversations was obtained from both customers and agents. Subsequently, all data was subjected to a strict anonymisation process to protect privacy. It was kept strictly confidential throughout the investigation.

7. Bibliographical References

- Lazim Abdullah and Solihah Khadiah. 2011. Fuzzy linguistic for measuring customer satisfaction. *Int. J. Latest Trends Comput*, 2(2).
- Jens Allwood and Loredana Cerrato. 2003. A study of gestural feedback expressions. In *First nordic symposium on multimodal communication*, pages 7–22. Copenhagen.
- Jens Allwood, Joakim Nivre, and Elisabeth Ahlsén. 1992. On the semantics and pragmatics of linguistic feedback. *Journal of semantics*, 9(1):1–26.
- Mary Jo Bitner. 1990. Evaluating service encounters: the effects of physical surroundings and employee responses. *Journal of marketing*, 54(2):69–82.
- Michael K Brady and J Joseph Cronin Jr. 2001. Customer orientation: Effects on customer service perceptions and outcome behaviors. *Journal of service Research*, 3(3):241–251.
- Carlton Brown. 2014. The effects of emotional intelligence (ei) and leadership style on sales performance. *Economic Insights-Trends & Challenges*, 66(3).
- Penelope Brown. 2013. *Politeness and impoliteness*. Oxford Academic.
- Penelope Brown and Stephen C Levinson. 1987. *Politeness: Some universals in language usage*, volume 4. Cambridge university press.
- Harry Bunt. 1994. Context and dialogue control. *Think Quarterly*, 3(1):19–31.
- Harry Bunt. 1999. Dynamic interpretation and dialogue theory. *The structure of multimodal dialogue*, 2:139–166.
- Harry Bunt. 2000. Dialogue pragmatics and context specification. *Abduction, belief and context in dialogue*, 2:139–166.
- Harry Bunt. 2006. Dimensions in dialogue act annotation. In *LREC*, pages 919–924.
- Harry Bunt. 2012. The semantics of feedback. In *16th Workshop on the Semantics and Pragmatics of Dialogue (SEMDIAL 2012)*, pages 118–127.
- Harry Bunt. 2019. Guidelines for using ISO standard 24617-2. *Sl:[sn]*.
- Harry Bunt, Jan Alexandersson, Jean Carletta, Jae-Woong Choe, Alex Chengyu Fang, Kiyong Lee, Volha Petukhova, Andrei Popescu-Belis, Laurent Romary, Claudia Soria, et al. 2010a. Towards an ISO standard for dialogue act annotation. In *Seventh conference on International Language Resources and Evaluation (LREC'10)*.
- Harry Bunt, Volha Petukhova, Emer Gilmartin, Catherine Pelachaud, Alex Fang, Simon Keizer, and Laurent Prévot. 2020. The ISO standard for dialogue act annotation. In *12th Edition of its Language Resources and Evaluation Conference (LREC 2020)*, pages 549–558. European Language Resources Association (ELRA).
- Harry Bunt, Volha Petukhova, David Traum, and Jan Alexandersson. 2017. Dialogue act annotation with the ISO 24617-2 standard. *Multimodal Interaction with W3C Standards: Toward Natural User Interfaces to Everything*, pages 109–135.
- HC Bunt, Jan Alexandersson, Jean Carletta, J Choe, A Chengyu Fang, Koiti Hasida, VV Petukhova, Andrei Popescu-Belis, Claudia Soria, and David Traum. 2010b. Semantic annotation framework (semaf), part 2: Dialogue acts. iso draft international standard iso 24617-2: 2010.
- Arjan Burgers, Ko de Ruyter, Cherie Keen, and Sandra Streukens. 2000. Customer expectation dimensions of voice-to-voice service encounters: a scale-development study. *International Journal of Service Industry Management*, 11(2):142–161.
- Dorina Chicu, Maria del Mar Pàmies, Gerard Ryan, and Christine Cross. 2019. Exploring the influence of the human factor on customer satisfaction in call centres. *BRQ Business Research Quarterly*, 22(2):83–95.

- Herbert H Clark and Meredyth A Krych. 2004. Speaking while monitoring addressees for understanding. *Journal of memory and language*, 50(1):62–81.
- Juliet M Corbin and Anselm Strauss. 1990. Grounded theory research: Procedures, canons, and evaluative criteria. *Qualitative sociology*, 13(1):3–21.
- Joan Cutting. 2005. *Pragmatics and discourse: A resource book for students*. Routledge.
- Bethan Davies. 2000. Grice's cooperative principle: Getting the meaning across. *Leeds Working Papers in Linguistics and Phonetics*, 8(1):26.
- Mark H Davis. 1983. Measuring individual differences in empathy: Evidence for a multidimensional approach. *Journal of personality and social psychology*, 44(1):113.
- Ko De Ruyter and Martin GM Wetzels. 2000. The impact of perceived listening behavior in voice-to-voice service encounters. *Journal of Service Research*, 2(3):276–284.
- D Todd Donavan, Tom J Brown, and John C Mowen. 2004. Internal benefits of service-worker customer orientation: Job satisfaction, commitment, and organizational citizenship behaviors. *Journal of marketing*, 68(1):128–146.
- Alei Fan, Hubert B Van Hoof, Xueting Dou, and Ana Lucia Serrano. 2023. The impact of linguistic style on customer satisfaction: a cross-cultural empirical study in ecuador. *International Hospitality Review*, 37(1):125–142.
- M Freese and D Fay. 2001. Personal (initiative: an active performance concept for work in the 21st century. in b. staw & r. sutton (eds.), research in organizational behavior (vol. 23, pp. 133-187).
- Allison S Gabriel, Arik Cheshin, Christina M Moran, and Gerben A Van Kleef. 2016. Enhancing emotional performance and customer service through human resources practices: A systems perspective. *Human Resource Management Review*, 26(1):14–24.
- Ralph W Giacobbe, Donald W Jackson Jr, Lawrence A Crosby, and Claudia M Bridges. 2006. A contingency approach to adaptive selling behavior and sales performance: Selling situations and salesperson characteristics. *Journal of personal selling & sales management*, 26(2):115–142.
- Audrey Gilmore and Lesley Moreland. 2000. Call centres: how can service quality be managed? *Irish Marketing Review*, 13(1):3.
- Atefeh Hadi et al. 2013. A critical appraisal of grice's cooperative principle. *Open journal of modern linguistics*, 3(1):69–72.
- Claudia Jasmand, Vera Blazevic, and Ko De Ruyter. 2012. Generating sales while providing service: A study of customer service representatives' ambidextrous behavior. *Journal of Marketing*, 76(1):20–37.
- Mark C Johlke. 2006. Sales presentation skills and salesperson job performance. *Journal of Business & Industrial Marketing*, 21(5):311–319.
- Jordi Luque, Carlos Segura, Ariadna Sánchez, Mart Umbert, and Luis Angel Galindo. 2017. The role of linguistic and prosodic cues on the prediction of self-reported satisfaction in contact centre phone calls. In *INTERSPEECH*, pages 2346–2350.
- Bernard Marr and Andrew Neely. 2004. Managing and measuring for value: The case of call centre performance. Technical report, Cranfield School of Management and Fujitsu.
- Philipp Mayring et al. 2004. Qualitative content analysis. *A companion to qualitative research*, 1(2):159–176.
- Vincenzo Pallotta and Rodolfo Delmonte. 2013. Interaction mining: the new frontier of customer interaction analytics. *New Challenges in Distributed Information Filtering and Retrieval: DART 2011: Revised and Invited Papers*, pages 91–111.
- Arun Parasuraman, Leonard L Berry, and Valarie A Zeithaml. 1991. Understanding customer expectations of service. *MIT sloan management review*.
- Volha Petukhova. 2011. *Multidimensional dialogue modelling*. Ph.D. thesis, Tilburg University.
- Volha Petukhova and Harry Bunt. 2009. Grounding by nodding. In *Proceedings of GESPIN, Conference on Gestures and Speech in Interaction, Poznań*.
- Volha Petukhova and Harry Bunt. 2010a. Introducing communicative function qualifiers. In *Proceedings Second International Conference on Global Interoperability for Language resources (ICGL-2), Hong Kong*, pages 123–131.
- Volha Petukhova and Harry Bunt. 2010b. Towards an integrated scheme for semantic annotation of multimodal dialogue data. In *LREC*.

- Volha Petukhova and Harry Bunt. 2020. Adapting the iso 24617-2 dialogue act annotation scheme for modelling medical consultations. In *16th Joint ACL-ISO Workshop on Interoperable Semantic Annotation PROCEEDINGS*, pages 75–87.
- Volha Petukhova, Martin Gropp, Dietrich Klakow, Anna Schmidt, Gregor Eigner, Mario Topf, Stefan Srb, Petr Motliceck, Blaise Potard, John Dines, et al. 2014. The dbox corpus collection of spoken human-human and human-machine dialogues. Technical report, European Language Resources Association (ELRA).
- Volha Petukhova, Laurent Prévot, and Harry Bunt. 2011. Multi-level discourse relations between dialogue units. In *Proceedings 6th joint ACL-ISO workshop on interoperable semantic annotation (ISA-6)*, Oxford, pages 18–27.
- Volha Petukhova, Christopher Stevens, Harmen De Weerd, Niels Taatgen, Fokke Crossen, and Andrei Malchanau. 2016. Modelling multi-issue bargaining dialogues: Data collection, annotation design and corpus. In *Proceedings of the Tenth International Conference on Language Resources and Evaluation (LREC'16)*, pages 3133–3140.
- Rashmi Prasad and Harry Bunt. 2015. Semantic relations in discourse: The current state of iso 24617-8. In *Proceedings of the 11th Joint ACL-ISO Workshop on Interoperable Semantic Annotation (ISA-11)*.
- Elaine D Pulakos, Sharon Arad, Michelle A Donovan, and Kevin E Plamondon. 2000. Adaptability in the workplace: Development of a taxonomy of adaptive performance. *Journal of applied psychology*, 85(4):612.
- Anat Rafaeli, Lital Ziklik, and Lorna Doucet. 2008. The impact of call center employees' customer orientation behaviors on service quality. *Journal of service research*, 10(3):239–255.
- Robert Saxe and Barton A Weitz. 1982. The soco scale: A measure of the customer orientation of salespeople. *Journal of marketing research*, 19(3):343–351.
- Jutta Stock, Volha Petukhova, and Dietrich Klakow. 2022. Assessment of sales negotiation strategies with iso 24617-2 dialogue act annotations. In *Proceedings of the 18th Joint ACL-ISO Workshop on Interoperable Semantic Annotation within LREC2022*, pages 10–19.
- Ruth Maria Stock and Wayne D Hoyer. 2005. An attitude-behavior model of salespeople's customer orientation. *Journal of the academy of marketing science*, 33(4):536–552.
- V Sudarsan and Govind Kumar. 2019. Voice call analytics using natural language processing. *Int. J. Stat. Appl. Math*, 4:133–136.
- Nigel Ward and Wataru Tsukahara. 2000. Prosodic features which cue back-channel responses in english and japanese. *Journal of pragmatics*, 32(8):1177–1207.
- Barton A Weitz, Harish Sujan, and Mita Sujan. 1986. Knowledge, motivation, and adaptive behavior: A framework for improving selling effectiveness. *Journal of marketing*, 50(4):174–191.
- Zazli Lily Wisker and Athanasios Poulis. 2015. Emotional intelligence and sales performance. a myth or reality? *International Journal of Business and Society*, 16(2).
- Laurie Wu, Han Shen, Alei Fan, and Anna S Mattila. 2017. The impact of language style on consumers' reactions to online reviews. *Tourism Management*, 59:590–596.
- Victor H Yngve. 1970. On getting a word in edgewise. In *Papers from the sixth regional meeting Chicago Linguistic Society, April 16-18, 1970, Chicago Linguistic Society, Chicago*, pages 567–578.
- Valarie A Zeithaml. 1988. Consumer perceptions of price, quality, and value: a means-end model and synthesis of evidence. *Journal of marketing*, 52(3):2–22.