

# Assessment of Sales Negotiation Strategies with ISO 24617-2 Dialogue Act Annotations

Jutta Stock<sup>1,2</sup>, Volha Petukhova<sup>2</sup>, Dietrich Klakow<sup>2</sup>

<sup>1</sup>DPV Deutscher Pressevertrieb GmbH, Hamburg, Germany

<sup>2</sup>Saarland University, Spoken Language Systems, Saarbrücken, Germany

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

## Abstract

Call centres endeavour to achieve the highest possible level of transparency with regard to the factors influencing sales success. Existing approaches to the quality assessment of customer-agent sales negotiations do not enable in-depths analysis of sales behaviour. This study addresses this gap and presents a conceptual and operational framework applying the ISO 24617-2 dialogue act annotation scheme, a multidimensional taxonomy of interoperable semantic concepts. We hypothesise that the ISO 24617-2 dialogue act annotation framework adequately supports sales negotiation assessment in the domain of call centre conversations. Authentic call centre conversations are annotated and a range of extensions/modifications are proposed making the annotation scheme better fit this new domain. We concluded that ISO 24617-2 serves as a powerful instrument for the analysis and assessment of sales negotiation and strategies applied by a call centre agent.

**Keywords:** call centre, semantic annotations, interaction analysis

## 1. Introduction

For companies and their associated call centres, information about service quality, sales success factors and customer satisfaction is a valuable asset. Call centres routinely record interactions with their customers, such as phone calls and emails. To record, track and analyse conversational data, Speech Analytics Tools (SAT) are used, such as AVOKE<sup>1</sup>, Talkdesk<sup>2</sup>, NICE<sup>3</sup>, and VERINT<sup>4</sup>. The current SAT applications for call centre interactions incorporate speech-to-text and text mining functionalities. However, most of them do not enable in-depths analysis of persuasive communicative and sale strategies that account for social and interpersonal aspects, affected cognitive states of interlocutors, and the corporate organisational rules and business logic. Being able to plan, monitor and evaluate appropriate interactive and sales negotiation strategies while optimising customer satisfaction for inbound service calls are the core skills and tasks of call centre agent in order to gain high economic and reputation advantages for their company.

In the challenging call centre environment, agents are advised to regard any service call as an opportunity for sales and an option to connect the customer to the corporate brands and products. At the same time, agents need to preserve customer satisfaction and choose the most efficient strategy to keep the Average Handling Time (AHT) as short as possible. To support this, agents have a set of special offers, including discounts and vouchers. Agents may experience a variety of situations with angry, difficult, extreme wordy or helpless customers or those whose context or needs are not

clear. Call centre agents have to be aware that their interactions and attitudes will influence the outcome of a call, both negatively and positively. This leads to the following question: why are some agents successful while others cannot finalise a single deal, despite the fact that they share the same set of special offers and vouchers or even have high activity indexes.

To obtain a better understanding of the exact nature of strong and weak communicative and sales negotiation strategies, a comprehensive analysis of authentic conversations is required. While there are different opinions and guidelines concerning what constitutes human-like intelligent communicative behaviour, supported by formal (qualitative and quantitative) studies, data driven studies of authentic human-human interactions in many domains, especially those sensitive to personal data, are very scarce. Call centre conversations usually contain private data, such as full name and address, often also much more sensitive and legally protected data, such as bank and credit card details. Call centres are very careful about their data and are even obliged to purge it regularly, e.g. every 3-6 months; they are reluctant to share it for research purposes. On the other hand, the lack of comprehensive, theoretically well motivated, and potentially automatable analysis methods play a major role in hindering large scale data driven research in this area. The study reported in this paper is the first step in addressing this gap and developing a conceptual and operational framework for a comprehensive multidimensional, multi-level and multi-factor interaction analysis of call centre interactions. The analysis involves annotations with dialogue act information. Annotation schemes have been constructed to be useful for both empirically-based studies of interactive and task-related phenomena, and for the data-driven design of interactive systems. We hypothesise that the ISO

<sup>1</sup><https://www.intrado.com/>

<sup>2</sup><https://www.talkdesk.com/>

<sup>3</sup><https://www.nice.com/>

<sup>4</sup><https://www.verint.com/>

24617-2 dialogue act annotation framework will adequately support sales negotiation assessment in the domain of call centre conversations. The presented study tests this assumption and performs a comprehensive analysis of the annotated communicative behaviour applying the ISO-24617-2 taxonomy (Second Edition, (ISO, 2020)). We extend the ISO 24617-2 repository of communicative functions specific to a given application domain and enrich functional aspects of dialogue act specifications with domain-specific semantic content in various forms and degrees of detail. This allows customising the ISO 24617-2 dialogue act taxonomy as a tool to support effective understanding and assessment of call centre inbound interactions accounting for the relationship between language-specific schemes and emotional, social and cognitive determinants of sales negotiation strategies.

The remainder of this paper is structured as follows. Section 2 discusses the domain of sales negotiations and the related work performed in the analysis and modelling of call centre conversations. Section 3 addresses the complexity of call centre sales negotiations and specifies a number of use cases. In Section 4, the ISO 24617-2 annotation framework and previous relevant annotation efforts are presented. Section 5 presents annotation experiments performed to assess the applicability and coverage of concepts defined in the ISO 24617-2 taxonomy to the target domain, whereby we specify the corpus data and discuss the results obtained. Section 6 proposes extensions to ISO 24617-2 to make it powerful and accurate, as required for the use cases to analyse and model call centre interactions. Finally, Section 7 summarises our findings and outlines directions for future research and development.

## 2. Domain of Sales Negotiations

People negotiate daily, often without considering it to be a negotiation (Fisher et al., 2011). The study of negotiation has been an active research field for a long time, pursued from the perspectives of several disciplines including psychology, organisational behavior, decision sciences, game theory, communication, and others. The overall questions concern what drives several parties to negotiate, how they behave when doing so, how they should handle negotiations to obtain specific results, and how disputants can be helped reaching joint, mutually satisfactory decisions (Borbély et al., 2017). It can be further observed that negotiation wisdom remains rather distributed in its disciplines and practices of origin.

To understand communicative negotiation behaviour in call centre interactions, we consider it important that negotiation is always a process (Lax and Sebenius, 1986). For instance, (Weingart and Olekalns, 2004) mentions that the negotiation process is related to tactics that are not used in isolation but rather in combination to form a strategy. The way in which tactics are

combined to form a strategy or strategies are employed to reach a goal is reflected in the form of the communication.

The actual negotiation phase in such interactions is called the *sales approach* which reflects the step-by-step proposition developed by a sales person or company to improve the selling process. The sales process can be defined as a linear process with chronological steps of interest generation, presentation and closing (Freese, 2000). A properly developed sales approach is what sometimes differentiates an amateur salesperson from an experienced one. Top-performing salespeople treat customer interactions like a hierarchical set of if-then choices, while other salespeople treat customer interactions as a linear dialogue (Leigh et al., 2014).

The particular challenge with incoming service calls is that the customer has a service request and does not expect a sales offer. It is therefore all the more important that the agent consciously chooses his strategy. Like many others in marketing literature, (McFarland et al., 2006) refers to the importance of rapport building, consultative communication, presenting tangible benefits, using financial incentives and creating an emotional response in customers as strategic tools to support successful sales negotiations.

Communication strategies are not well explored within the call centre scenarios. Call centre conversational data has been analysed from many perspectives, including: to classify call types (Tang et al., 2003), assist and monitor agents' performances (Mishne et al., 2005), filter problematic conversations (Hastie et al., 2002), develop domain models (Roy and Subramaniam, 2006), and enable automatic user-specified analysis (Takeuchi et al., 2009). There is also a steady growing research interest in automatic assessment of call centre service quality relating agents characteristics (including their personalities and communication skills) to the negotiation outcome. In (Clark, 2011), it has been observed that communication strategies for call centre agents are a missing area of research. With this study, we aim to outline an approach to close this gap accordingly.

## 3. Use Cases

Limitations of pure text-based speech analytics software solutions have been described by (Pallotta and Delmonte, 2013). It was emphasised that conversational speech is fundamentally different from written text and that the analysis of conversations can not be only focused on semantics. In our view, there are at least three important techniques used by a sales agent that may significantly influence sales success, namely the agent's: (1) pervasive questioning methods, (2) specific customer-oriented behaviour and (3) power of persuasion.

### 3.1. Pervasive Questioning

According to (Kellermann, 2007), questioners put words in the answerer's mouth, shaping their re-

sponses. Even small changes in word choice and order, presuppositions and framing effects upon which questions are based, the implications that they carry and their surface form may trigger major changes in answers.

In the marketing literature, there are numerous references to the importance of questioning techniques. A salesperson's questioning skill is the act of asking customers probing and insightful questions that uncover their buying situation and needs (Shoemaker and Johlke, 2002). In the need identification stage of a sales encounter, customer oriented sales people engage in behaviors to identify the customer's interests, goals, and other product-related needs (Homburg et al., 2011). The most straightforward way to identify customer needs is to ask questions.

Furthermore, it is underlined that effective questioning skills should yield immediate performance benefits, compared to customer orientation (CO) and adaptive selling (AD)(Arndt et al., 2018). Methodologies such as the SPIN model (Rackham, 2020) or (Freese, 2000) are commonly used to support salesperson training to effectively ask questions. It is emphasised that questions persuade more powerfully than any other form of verbal behaviour. Open and closed questions are distinguished, whereby the latter are acknowledged as stronger instrument to persuade the customer to disclose more and initially not-intended information about his/her preferences and constraints.

### 3.2. Customer Oriented Behaviour

From experience, we know that some agents are capable of seizing any opportunity and successfully closing a deal, even if they face negatively loaded, complaining customers. Customer-oriented behaviours (COB) that an agent can show will significantly increase customer satisfaction and therefore influence sales success. While intuitively there should be significant effects of being 'customer oriented' on service performance perceptions and sales outcomes, there is a lack of a clear understanding of what it means for a service organisation to be 'customer oriented' and how it fits into established service marketing paradigms (Brady and Cronin Jr, 2001). COB can be defined as the ability to identify, evaluate, understand, and meet customer needs (Reychav and Weisberg, 2009). (Mechinda and Patterson, 2011) define it as specific behaviors shown by front-line employees to increase customer satisfaction. Rafaeli (2008) defines five types of COB for call centre settings and relates them to the service quality as evaluated by customers: (1) anticipating customer requests; (2) providing explanations and justifications; (3) educating customers; (4) creating an emotional bond with a customer; and (5) offering personalised information.

Within the framework of adaptive selling, (Weitz et al., 1986) explain sales negotiation effectiveness by the knowledge of customer types and sales strategies, as

well as the motivation of salespeople to flexibly adapt their behavior and to alter their sales goals.

### 3.3. Persuasive Negotiation

In our view, one of the most powerful impact factors on the sales success is the persuasive power of an agent's arguments. Salespeople can adapt their persuasion strategies to reach the deal acceptance by the customer. Successful salespeople know which persuasion strategies are most appealing to their customers. Knowing certain customers' characteristics and preferences associated with those characteristics could inform agents what message strategies are optimal for which specific customers. The persuasiveness of messages can be affected by many factors and needs to be experimentally investigated.

People accept certain suggestions if they receive additional relevant information. Due to powerful rhetorical devices, messages may be perceived as strongly persuasive. People generally associate certain speech, personality and interaction features with what they think is a persuasive argument, e.g. related to audibility, engagement, conviction, authority and likability (AECAL) criteria, (see the overview provided by (Petukhova et al., 2017)).

People respond to persuasion strategies based on their distinct personality (Adler et al., 2016). There are also interpersonal social factors that influence persuasion preferences.

Messages conveying competence arguments have been shown to be more persuasive for higher power audiences while messages conveying warmth arguments are more persuasive for low power audiences. The big two of social cognition are *communion/warmth* and *agency/competence* (Fiske et al., 2002). Warmth subsumes characteristics like cooperativeness, trustworthiness, and likeability, whereas competence includes dominance, capability and status (Fiske, 2018).

Further, the role of psychological power in the persuasion process and the relationship between power and persuasion have been investigated by (Dubois et al., 2016). The authors outline a theoretical model to demonstrate that the persuasiveness of messages can be affected by the alignment between the psychological sense of power of the communicator and the audience. To model the specified use cases, we apply the ISO 24617-2 dialogue act taxonomy and propose the necessary domain-specific extensions. We expect to gain a better understanding of the interaction structure and establish reliable indicators for specific negotiation behavior.

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

Dialogue is a complex activity in the sense that it requires participants not only to understand and perform actions towards joint goals or underlying tasks, but also to continuously share background information about

the processing of each other’s messages, elicit feedback, manage the use of time, take turns, and monitor contact and attention, often simultaneously (Allwood, 2000; Bunt et al., 2012). Similarly, in call centre sales negotiations, dialogues serve at least three core functions: (1) to determine, monitor and resolve a customer-related sales problems (*Task and Task Management*), (2) to carry out and manage the successful interaction (*Dialogue Control*); and (3) to develop and maintain relationship between an agent, also in fact between an organization and a customer (*Interpersonal Relations Management*). These aspects can be addressed simultaneously in one utterance contributing to its multifunctionality and requiring multidimensional analysis. Multidimensional approaches to dialogue act annotation, that incorporate a multifunctional view of dialogue behavior, have been recognised by many researchers as empirically better motivated, and allowing a more accurate modelling of theoretical distinctions (Allwood, 2000; Core and Allen, 1997; Bunt, 1999; Klein, 1999; Larsson, 1998; Popescu-Belis, 2005).

ISO 24617-2 (Second Edition, (ISO, 2020)) presents the semantic framework for the systematic analysis of behaviour of dialogue participants, taking a multidimensional view on dialogue in the sense that participation in a dialogue is viewed as performing several activities in parallel, such as pursuing the dialogue task or activity, providing and eliciting feedback, and taking turns. These activities in various ‘dimensions’ are called *dialogue acts* and are semantic units in the description of dialogue behaviour, characterising how the information state(s) of the participant(-s) at whom the behaviour is directed are changed when he/they understands the behaviour. Dialogue acts have two main components: a *semantic content*, which corresponds to what the utterance is about, e.g. objects, events, etc.; and a *communicative function*, which specifies how an addressee updates his information state with the semantic content when he understands the corresponding aspect of the meaning of a dialogue utterance. ISO 24617-2 includes the specification of the XML-based Dialogue Act Markup Language (DiAML) for the representation of dialogue act annotations (Bunt et al., 2012).

Assigning communicative functions to utterances in multiple dimensions can help represent the meaning of dialogue contributions at an adequate level of complexity for interaction analysis, resulting in multi-layered annotations. Nine dimensions are distinguished, addressing information about *tasks*, the processing of utterances by the speaker (*auto-feedback*) or the addressee (*allo-feedback*), managing difficulties in the contributions of the speaker (*own communication management*) or that of the addressee (*partner communication management*), the speaker’s need for time to continue the dialogue (*time management*), the allocation of the speaker role (*turn management*), topic management (*dialogue structuring*), and managing social obli-

gations (*social obligations management*).

The ISO 24517-2 dialogue act annotation scheme is an open domain-independent taxonomy. The multidimensional nature of the ISO taxonomy enables various extensions and offers the opportunity to tailor it to specific applications and domains. It has been successfully used to analyse and model interactive games (Petukhova et al., 2014), multi- and two-party political debates (Petukhova et al., 2015; Petukhova et al., 2018), multi-issue bargaining dialogues (Petukhova et al., 2016), and robot-assisted disaster responses (Anikina and Kruijff-Korbyová, 2019). Plug-ins have been defined in (Bunt, 2019) that allow DiAML expressions to be enriched with (a) articulate semantic content representations, tailored to the semantic complexity of a specific application domain, e.g. specifying negotiation and debate semantics (Malchanau, 2019), modality-specific semantics (Lapina and Petukhova, 2017); and (b) descriptions of emotions, for example following EmotionML (Burkhardt et al., 2017). Finally, additional specific types of communicative action for a given application domain can be defined. For example, as shown when modelling medical consultations (Petukhova and Bunt, 2020).

## 5. Annotation Experiments

The goal of our annotation experiments is to identify key dialogue phenomena specific to the call centre interactions and mainly related to participants’ strategies.

### 5.1. Corpus Data

The analysed corpus presents a selection of inbound service calls from a publishing house where call centre agents communicate with various customers. These interactions are initiated by the customer, calling the contact centre for a wide range of services like ordering, cancelling their magazine subscription, expressing a complaint or changing their address. Using the in-house speech analytics application of VONAGE<sup>5</sup>, the data collection process is organised to extract specific rather than random dialogue recordings. For instance, to find typical call centre situations featuring rich sales negotiation behavior, we selected dialogues where the customer intends to cancel the subscribed service and the call centre agent applies at least one sales approach to prevent the customer from cancelling. To achieve this, keyword lexicon functionality is used to extract dialogues containing the customer’s utterances “I’d like to cancel the subscription of magazine XX” and those of an agent’s “We have very attractive proposals with a discount...”.

The final analysed corpus includes 60 call centre interactions with a total duration of 4 hours. The dialogue data is provided with the metadata concerning: call duration, agent ID and time stamp per turn. The speech signals (audio recordings, one channel per

<sup>5</sup><https://www.vonage.com>

Dimension	Functional segments (in%)			Dimension	Communicative Function	Relative frequency in %
	ALL	from those Company	Customer			
Task	41.0	53.6	46.4	Task	request	11.6
rhetoricalRelation	8.9	63.9	36.1		answer	5.8
qualifier	3.2	34.7	36.1		confirm	19.9
autoFeedback	8.8	59.5	40.5		inform	28.5
turnManagement	20.0	52.2	47.8		setQuestion	6.4
timeManagement	3.2	68.0	32.0	Turn Management	checkQuestion	5.1
ownCommunicationManagement	1.1	46.8	53.2		choiceQuestion	1.1
discourseStructuring	2.9	80.1	19.9		turn-unit-initial functions	46.0
socialObligationsManagement	10.8	57.1	42.9	discourseStructuring	turn-unit-final functions	50.1
					opening	34.2
					closing	35.4
					topicShift	13.7
					interactionStructuring	16.8

Table 1: Distribution of functional segments across dimensions produced by the Customer and Company, in terms of relative frequency (in %), Distribution of the most frequent dialogue acts, in terms of relative frequency (in %)

speaker) were automatically transcribed and manually corrected.

## 5.2. Annotations

The ISO 24617-2 annotations were performed segmenting participant’s turns into functional segments as having one or more (potentially qualified) communicative functions, dependence and rhetorical relations between segments and/or dialogue acts. The corpus contains 29,954 tokens, segmented into 3,572 functional segments from which the customer produced 1,590 segments (45%) and the company about 1,982 (55 %). An average call duration comprises 3.7 minutes.

From all dialogues that feature subscription cancellations by the customer, about 40% of the interactions were successfully completed by a call centre agent, i.e a cancellation was avoided or an alternative product was successfully offered. Dialogues have a similar structure and comprise (i) the opening, (ii) customer identification, (iii) the discussion of an issue related to the subscription, e.g. mostly subscription cancellations, (iv) the sales approach by the agent, and (v) closing.

Semantic content specifications can be plugged in into the ISO 24617-2 standard as proposed by (Bunt, 2019). Table 1 provides an overview of dialogue act distribution addressing ISO 24617-2 dimensions as well as three dimensions in detail. It can be observed that agent-customer interactions are dominated by task-related exchanges. The Task dimension was addressed in 41.0% of all functional segments.

Within the Task dimension, the largest share of the categories comprise Request, Answer, Confirm and Inform with a total share of 65,8%, expressing a focused exchange of information. They are predominantly related to concerns about customer identification, information regarding the cancellation procedure or eliciting customer’s interests. The next big part comprises tags in the question categories of Set Question, Check Question and Choice Question with a share of 12,6 %, with the majority being part of the sales negotiation, or detailed questions about offers or re-negotiations. The remaining 21,6 % are distributed among categories that focus on the sales negotiation, mostly presentation of Offers and Suggestions, and corresponding responses to them such as Decline- or Accept Offer or Suggest

respectively.

The Turn Management dimension is dominated by *turn-unit-initial* functions when the customer agrees to take the turn, which the agent has given to him/her and *turn-unit-final* functions when the agent wants the customer to take the turn. This is due to a high share of request and information exchange dialogue acts.

Discourse Structuring categories like opening and closing the conversation, topic shift and active interaction structuring are clearly dominated by the agent (80,1 %) as the leading participant of the communication.

In summary, the standard functions of the ISO 24617-2 taxonomy provide a comprehensive view of the structure, the process steps and the actions of the participants in the conversation.

Examples:

- (1) Company: Is there a particular reason why you no longer wish to read the magazine? *<Task;setQuestion(cancellation:reason)>*  
Customer: I don’t have the time *<Task; answer(cancellation:reason:lack\_of\_time)>*
- (2) Company: I will use your email address to send you the cancellation confirmation. I think it will take 48 hours at the latest. With a bit of luck, it will be in your e-mail box this evening. Then you’ll have it in black and white. *<Task; inform (cancellation:procedure); rhetoricalRelation (explanation)>*
- (3) Company: Of course, we don’t want to lose you as a customer. So that you don’t cancel, I could offer that you read another 8 months, but only pay for 6. Then you will have two full months of the magazine free of charge. *<Task; suggest (sales:offer:advantage:price); rhetoricalRelation(elaboration)>*

## 6. ISO 24617-2 Extensions and Modifications

Applying the ISO 24617-2 scheme with its rich inventory of dialogue act tags to call centre interactions has shown that there remain a number of uncovered sections for assessing sales negotiation behavior. To identify and understand the communicative behavior described in the use cases, we propose the following extensions and modifications.

Semantic Content			
1st Level	2nd Level	3rd level	
customerIdentification	name		
	contactDetails	address phoneNumber email other	
	callReason	delivery cancellation other	
subscriptionDetails	conditions		
	invoice		
	service	satisfaction	
	product	satisfaction	
cancellationDetails	subscription		
	procedure		
	payment		
	reason	lackOfTime	
		content	
		age	
advertising			
volume	financial		
	changeInterest		
pausing			
other			
salesOffer	alternative	product condition	
	advantage	specialPrice	
		flexibility digitalProduct service	

Table 2: Semantic content categories at multiple levels of specificity.

## 6.1. Semantic Content

ISO 24617-2 focuses on the functional aspects of dialogue acts and supports the annotation of semantic content by means of plug-ins. To model participants intentions and sales negotiation strategies in the call centre domain, the semantic content is essential. Discussed topics were observed to reflect the aforementioned dialogue structure. The distribution of all functional segments addresses the main topics of the cancellation procedure and the sales approach undertaken by the call centre agent. Other information is concerned with customer identification, contact details and addressing social and structural aspects, e.g. greetings, thanking, topic shifts, see Table 2. Functional segments addressing subscription cancellation and sales approach are of particular interest.

It merged that this structure, containing up to three level of semantic content, supports the understanding of the communicative intentions, as well as the strategic components of sales negotiation behavior. By annotating, for example, a cancellation reason such as `cancellationDetails:reason:lackOfTime`, see example in (1) rather than only a cancellation, the agent’s decision on which products and offers to present to the customer becomes transparent. Furthermore, we have differentiated various sales offers. It is interesting to observe which product advantages such as price, flexibility or alternatives are incorporated into the sales approach ar-

gumentation, and how clients respond to them. Strategic approach, questions and corresponding answers, as well as argumentation and objection handling become evident. In these parts of the conversation, strategic aspects of sales negotiations, flexible and adaptive behaviour (Weitz et al., 1986) become transparent as well as the agent’s ability to think in if-then dependencies in their sales approach (Leigh et al., 2014). Overall, analysis of various approaches leading to particular outcomes can be compared and the most successful sales strategies can be identified.

Table 2 provides the list of defined semantic content categories at multiple levels of specificity.

## 6.2. Interpersonal Relations Management

Successful relationship building is one of the prerequisites for sales negotiation. Therefore, it is important to capture all clues that express developing and maintaining a relationship between an agent and a customer. In the conversations analysed, the main challenge is that two strangers are trying to address their concerns and build a relationship in a very limited period of time. Still challenging is that customers are often suspicious about subscriptions, because they fear long, inflexible contract terms. Therefore, building trust is significant. Clients expect proper management and precise information especially regarding their termination modalities and possible new contracts.

## 6.3. Rhetorical Relations

Concerning rhetorical relations, ISO 24617-2 (ISO, 2020) does not propose a specific set of relations to be used, but defines a plug-in for ISO 24617-8 discourse relations annotation standard (Bunt and Prasad, 2016) to be incorporated into dialogue act annotations. In (Bunt et al., 2017), it is explained that rhetorical relations can optionally be annotated to express how one dialogue act motivates the performance of another dialogue act.

In linguistic literature there is a wide field of research on discourse relations, also described as *coherence relations* or *rhetorical relations* (Prasad and Bunt, 2015). Relations bind contiguous segments of text into a global structure for the text as a whole with elaborations, explanations, contrasts, parallelisms, etc. (Hobbs, 1985) We applied rhetorical relations categories offered by the ISO 24617-8 taxonomy and focused on those that have relevance for the domain specific use cases.

The following categories were the most frequently observed: explanation, restatement, elaboration, cause and recommendation, see Table 3. Explanations, elaborations and recommendations are mostly used by the agent. (S)he often explains offers proposed and why communication needs to be terminated or resumed/repeated, see examples in (2) and (3). At the same time, the customer mostly provides reasons and restatements. This behaviour is closely related to the client’s desire to be understood by the agent, e.g. by

Rhetorical Relations	Company	Customer
explanation	51.2	73.2
restatement	14.5	39.4
elaboration	13.1	85.9
cause	9.2	17.8
recommendation	3.7	100

  

Qualifier	Company	Customer
happy	27.4	35.4
uncertain	25.7	8.9
dissatisfied	11.4	0
pleased	10.9	63.2
satisfied	8.6	93.3

Table 3: Top five rhetorical relations and qualifiers, distributions in relative frequency in (%).

specifying the purpose of his call or explaining the reason for subscription cancellation. It has been observed that rhetorical relations mostly connect consecutive segments.

#### 6.4. Qualifiers

Agents should be aware of the customer’s feelings and insecurities, and this ideally at the very beginning of the phone call. In cases of complaint, feelings are obviously mostly negative. However, many customers do not openly express their sentiment and it is not always easy to determine it. Recognizing and understanding such behaviour is important to gain and maintain customer acceptance and satisfaction, and initiate successful sales negotiations.

To model these aspects of communicative behavior, we incorporated qualifiers into our annotations and further analysis. In the ISO 24617-2, sentiment qualifiers, that we mostly are interested in, are underspecified and negative-neutral-positive values are defined. Finer distinctions would be required to model our use case, in particular when addressing COB strategies. For instance, positive sentiments qualifiers such as amused, happy or pleased may be important to compute the degree of customer satisfaction.

Similarly, sentiment (emotions, affect) analysis may be highly relevant for sales negotiations addressing customer complaints. In the analysed subscription cancellations, about 175 segments are annotated with qualifiers. With a total of 3,572 segments, however, this is a very small proportion. Table 3 provides an overview of the top five qualifier categories. The main share of the qualifiers *happy*, *dissatisfied* and *uncertain* lies on the customer side. Situations in which these sentiments could be observed are, for example, uncertainties about the cancellation process. Expressing happiness is often related with the outcome of the conversation, when the customer is delighted to have either successfully cancelled subscription or is excited about having ordered a new product in combination with an attractive offer. On the agent side, the categories *pleased* and *satisfied* are most frequent, these occur especially at the end of

the conversation.

An emotion has an experiencer and an object that the emotion is directed to. While in ISO 24617-2 qualifiers are attached to communicative functions modifying/strengthening its force, sender’s attitudes can be expressed towards other participants and towards the utterance content. The former should be modelled as part of the Interpersonal Relations Management, and the latter as part of the semantic content.

Applying qualifier as an open category brings the advantage to be flexible in description of various domain-specific phenomena. For these fine-grained descriptions, many different approaches to emotions and affective states classification can be used. One of the best known taxonomies of emotions, which is still relevant nowadays, is defined in Ekman’s work (Ekman, 1999), (Ekman, 1992), where six basic emotions such as anger disgust, fear, happiness, sadness and surprise are distinguished. There is no agreed benchmark in the form of emotion terms, therefore he proposes an everyday emotion vocabulary (Cowie et al., 1999). It is recommended in ISO 24617-2 to define a plug-in using EmotionML (Schröder et al., 2011), which is a flexible scheme offering a wide range of possibilities to annotate affective aspects of dialogue behaviors. Emotions are represented in terms of ‘emotion categories’, ‘dimensions’, ‘action-tendencies’. Other values that can be considered is the confidence of human annotator as well as related to valence and arousal dimensions defined in circumplex model of (Russell, 1980).

## 7. Conclusion

In this study, call centre conversations were under investigation, sales negotiation behaviour in particular. Taking the complexities of sales negotiation into account, we considered several use cases which support assessment of the sales success: questioning techniques, customer oriented behaviour and the power of persuasion.

Based on the obvious limitations of the existing speech analytics solutions, we applied the ISO 24617-2 dialogue act taxonomy in order to reply our research questions. The ISO 24617-2 has been already proven to be useful in qualitative and quantitative detailed studies of communication behavior. Due to the multidimensional nature and flexibility in terms of possible extensions, we aimed to obtain a deeper understanding of the participants negotiation behaviour. Customer-agent human-human dialogues were annotated and the occurrences of dialogue acts, their semantic content and relations between them were analysed. Such detailed multidimensional ISO 24617-2 based annotations provided insights into the structure, processing steps and communicative behaviour of the negotiation participants. Already at this initial research stage, the advantages of the standard procedures became apparent. However, as enabled by the framework and specified by the standard procedures, certain domain-specific extensions or

modifications are necessary including modelling important social and interpersonal aspects of sales negotiation and customer-oriented behaviour. The application of qualifier and rhetorical relations are essential for the processing of the use cases, but require further specification to close gaps in . Hereby we established a framework that enables in-depth analysis of sales negotiation behaviour.

For future research, we suggest the following perspectives and application development on the basis of our outcomes. All three use cases will be explored in individual studies; specific research questions and hypotheses will be formulated and empirical experiments designed.

The annotation methodology will consistently rely on the ISO 24617-2 guidelines for semantic and discourse information annotations (Second Edition, (ISO, 2020)). Annotation costs, quality as well as the individual processing steps will be documented in detail. In the follow-up annotation experiments, trained and (domain) expert annotators will be involved. Due to practically unlimited access to the call centre data, a wide range of various interactive scenarios will be investigated. Existing marketing theories and models will be empirically validated and novel models or their components may emerge.

### Acknowledgments

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

### 8. References

- Adler, R. F., Iacobelli, F., and Gutstein, Y. (2016). Are you convinced? a wizard of oz study to test emotional vs. rational persuasion strategies in dialogues. *Computers in Human Behavior*, 57:75–81.
- Allwood, J. (2000). An activity-based approach to pragmatics. *Abduction, Belief and Context in Dialogue*, pages 47–81.
- Anikina, T. and Kruijff-Korbová, I. (2019). Dialogue act classification in team communication for robot assisted disaster response. In *Proceedings of the 20th Annual SIGdial Meeting on Discourse and Dialogue*, pages 399–410.
- Arndt, A. D., Rippé, C. B., and Castleberry, S. B. (2018). Any questions? questioning skill as a selling tactic for sales students. *Journal for Advancement of Marketing Education*, 26(2).
- Borbély, A., Ebner, N., Honeyman, C., Kaufman, S., and Schneider, A. K. (2017). A grand unified negotiation theory: In context. *J. Disp. Resol.*, page 145.
- Brady, M. K. and Cronin Jr, J. J. (2001). Customer orientation: Effects on customer service perceptions and outcome behaviors. *Journal of service Research*, 3(3):241–251.
- Bunt, H. and Prasad, R. (2016). Iso dr-core (iso 24617-8): Core concepts for the annotation of discourse relations. In *Proceedings 12th Joint ACL-ISO Workshop on Interoperable Semantic Annotation (ISA-12)*, pages 45–54.
- Bunt, H., Alexandersson, J., Choe, J.-W., Fang, A. C., Hasida, K., Petukhova, V., Popescu-Belis, A., and Traum, D. (2012). Iso 24617-2: A semantically-based standard for dialogue annotation. In *Proceedings of the Eighth International Conference on Language Resources and Evaluation (LREC'12)*, pages 430–437.
- Bunt, H., Petukhova, V., Traum, D., and Alexandersson, J. (2017). Dialogue act annotation with the iso 24617-2 standard. In *Multimodal interaction with W3C standards*, pages 109–135. Springer.
- Bunt, H. (1999). Dynamic interpretation and dialogue theory. *The structure of multimodal dialogue*, 2:139–166.
- Bunt, H. (2019). Plug-ins for content annotation of dialogue acts. In *Workshop on Interoperable Semantic Annotation (ISA-15)*, page 33.
- Burkhardt, F., Pelachaud, C., Schuller, B. W., and Zovato, E. (2017). Emotionml. In *Multimodal interaction with W3C standards*, pages 65–80. Springer.
- Clark, C. M. (2011). *Communication strategies of call center agents: a multi-method study of solidarity building and conversation control on agent performance*. Ph.D. thesis, Nanyang Technological University.
- Core, M. G. and Allen, J. (1997). Coding dialogs with the damsl annotation scheme. In *AAAI fall symposium on communicative action in humans and machines*, volume 56, pages 28–35. Boston, MA.
- Cowie, R., Douglas-Cowie, E., Apolloni, B., Taylor, J., Romano, A., Fellenz, W., et al. (1999). What a neural net needs to know about emotion words. *Computational intelligence and applications*, 404:5311–5316.
- Dubois, D., Rucker, D. D., and Galinsky, A. D. (2016). Dynamics of communicator and audience power: The persuasiveness of competence versus warmth. *Journal of Consumer Research*, 43(1):68–85.
- Ekman, P. (1992). Are there basic emotions? *Psychological Review*, 99(3):550–553.
- Ekman, P. (1999). Basic emotions. *Handbook of cognition and emotion*, 98(45-60):16.
- Fisher, R., Ury, W. L., and Patton, B. (2011). *Getting to yes: Negotiating agreement without giving in*. Penguin.
- Fiske, S. T., Cuddy, A. J., Glick, P., and Xu, J. (2002). A model of (often mixed) stereotype content: competence and warmth respectively follow from perceived status and competition. *Journal of personality and social psychology*, 82(6):878.
- Fiske, S. T. (2018). Stereotype content: Warmth and competence endure. *Current directions in psychological science*, 27(2):67–73.
- Freese, T. (2000). *Secrets of question-based selling: How the most powerful tool in business can double your sales results*. Sourcebooks, Inc.

- Hastie, H., Prasad, R., and Walker, M. (2002). What's the trouble: automatically identifying problematic dialogues in darpa communicator dialogue systems. In *Proceedings of the 40th Annual Meeting of the Association for Computational Linguistics*, pages 384–391.
- Hobbs, J. R. (1985). On the coherence and structure of discourse.
- Homburg, C., Müller, M., and Klarmann, M. (2011). When should the customer really be king? on the optimum level of salesperson customer orientation in sales encounters. *Journal of marketing*, 75(2):55–74.
- ISO. (2020). *Language resource management – Semantic annotation framework – Part 2: Dialogue acts. ISO 24617-2, Second Edition*. ISO Central Secretariat, Geneva.
- Kellermann, K. (2007). Persuasive question asking: how question wording influences answers. In *Annual Meeting of the State Bar Association of California, Anaheim, CA*.
- Klein, M. (1999). Standardisation efforts on the level of dialogue act in the mate project. In *Towards Standards and Tools for Discourse Tagging*.
- Lapina, V. and Petukhova, V. (2017). Classification of modal meaning in negotiation dialogues. In *Proceedings of the 13th Joint ISO-ACL Workshop on Interoperable Semantic Annotation (ISA-13)*.
- Larsson, S. (1998). Using a type hierarchy to characterize reliability of coding schemas for dialogue moves.
- Lax, D. A. and Sebenius, J. K. (1986). Interests: The measure of negotiation. *Negotiation Journal*, 2(1):73–92.
- Leigh, T. W., DeCarlo, T. E., Allbright, D., and Lollar, J. (2014). Salesperson knowledge distinctions and sales performance. *Journal of Personal Selling & Sales Management*, 34(2):123–140.
- Malchanau, A. (2019). *Cognitive architecture of multimodal multidimensional dialogue management*. Saarländische Universitäts-und Landesbibliothek.
- McFarland, R. G., Challagalla, G. N., and Shervani, T. A. (2006). Influence tactics for effective adaptive selling. *Journal of Marketing*, 70(4):103–117.
- Mechinda, P. and Patterson, P. G. (2011). The impact of service climate and service provider personality on employees' customer-oriented behavior in a high-contact setting. *Journal of Services Marketing*.
- Mishne, G., Carmel, D., Hoory, R., Roytman, A., and Soffer, A. (2005). Automatic analysis of call-center conversations. In *Proceedings of the 14th ACM international conference on Information and knowledge management*, pages 453–459.
- Pallotta, V. and Delmonte, R. (2013). Interaction mining: the new frontier of customer interaction analytics. In *New challenges in distributed information filtering and retrieval*, pages 91–111. Springer.
- Petukhova, V. and Bunt, H. (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.
- Petukhova, V., Gropp, M., Klakow, D., Schmidt, A., Eigner, G., Topf, M., Srb, S., Motliceck, P., Potard, B., Dines, J., et al. (2014). The dbox corpus collection of spoken human-human and human-machine dialogues. In *Proceedings of the Ninth International Conference on Language Resources and Evaluation (LREC'14)*. European Language Resources Association (ELRA).
- Petukhova, V., Malchanau, A., and Bunt, H. (2015). Modelling argumentative behaviour in parliamentary debates: data collection, analysis and test case. In *Principles and Practice of Multi-Agent Systems*, pages 26–46. Springer.
- Petukhova, V., Stevens, C., de Weerd, H., Taatgen, N., Cnossen, F., and Malchanau, A. (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.
- Petukhova, V., Mayer, T., Malchanau, A., and Bunt, H. (2017). Virtual debate coach design: assessing multimodal argumentation performance. In *Proceedings of the 19th ACM International Conference on Multimodal Interaction*, pages 41–50.
- Petukhova, V., Malchanau, A., Oualil, Y., Klakow, D., Luz, S., Haider, F., Campbell, N., Koryzis, D., Spiliotopoulos, D., Albert, P., et al. (2018). The metalogue debate trainee corpus: Data collection and annotations. In *Proceedings of the Eleventh International Conference on Language Resources and Evaluation (LREC 2018)*.
- Popescu-Belis, A. (2005). Dialogue acts: One or more dimensions. *ISSCO WorkingPaper*, 62.
- Prasad, R. and Bunt, H. (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)*.
- Rackham, N. (2020). *SPIN®-selling*. Routledge.
- Rafaeli, A., Ziklik, L., and Doucet, L. (2008). The impact of call center employees' customer orientation behaviors on service quality. *Journal of service research*, 10(3):239–255.
- Reychav, I. and Weisberg, J. (2009). Going beyond technology: Knowledge sharing as a tool for enhancing customer-oriented attitudes. *International Journal of Information Management*, 29(5):353–361.
- Roy, S. and Subramaniam, L. V. (2006). Automatic generation of domain models for call-centers from noisy transcriptions. In *Proceedings of the 21st International Conference on Computational Linguistics and 44th Annual Meeting of the Association for Computational Linguistics*, pages 737–744.

- Russell, J. A. (1980). A circumplex model of affect. *Journal of personality and social psychology*, 39(6):1161.
- Schröder, M., Baggia, P., Burkhardt, F., Pelachaud, C., Peter, C., and Zovato, E. (2011). Emotionml—an upcoming standard for representing emotions and related states. In *International Conference on Affective Computing and Intelligent Interaction*, pages 316–325. Springer.
- Shoemaker, M. E. and Johlke, M. C. (2002). An examination of the antecedents of a crucial selling skill: Asking questions. *Journal of Managerial Issues*, pages 118–131.
- Takeuchi, H., Subramaniam, L. V., Nasukawa, T., and Roy, S. (2009). Getting insights from the voices of customers: Conversation mining at a contact center. *Information Sciences*, 179(11):1584–1591.
- Tang, M., Pellom, B., and Hacioglu, K. (2003). Call-type classification and unsupervised training for the call center domain. In *2003 IEEE Workshop on Automatic Speech Recognition and Understanding (IEEE Cat. No. 03EX721)*, pages 204–208. IEEE.
- Weingart, L. R. and Olekalns, M. (2004). Communication processes in negotiation: Frequencies, sequences, and phases. *The handbook of negotiation and culture*, pages 143–157.
- Weitz, B. A., Sujan, H., and Sujan, M. (1986). Knowledge, motivation, and adaptive behavior: A framework for improving selling effectiveness. *Journal of marketing*, 50(4):174–191.