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**Abstract**

The need for meaningful, value-creating interaction in marketing communications on the Web is also a need for a technological means to sustain the shift from manipulating the marketing mix towards managing information and knowledge. This paper explores knowledge graphs as potential enablers of context-aware and personalized marketing communications. The main research question in it is "How a knowledge graph can serve dialogic marketing communication?".

**Keywords**

marketing communications, dialogic communication, relationship marketing, knowledge graphs

Knowledge Graphs From the Perspective of Dialogic Marketing Communications

## 1. Introduction

Dialogue is a concept discussed in both interpersonal and organizational communication [1]. One way to define dialogue is as a culturally and historically specific way of social discourse accomplished through the use of language and verbal transactions [2]. In a dialogic interaction, the communication is looked not only from the perspective of the referential (descriptive) function of language, to use Jakobson's distinctions[3], but also but also from the phatic (interaction-driven) and metalingual (self-describing) functions of language. In marketing communications, dialogue is of strategic importance[4]. The concept is an integral part of the theory of relationship marketing [5] [6] as a means for customer satisfaction and retention[7]. Recently the foundational aspect of dialogue for marketing has grown in importance [8], especially in the light of the networked communication on the Web[9] and the increasing need to view relationships with stakeholders as an asset[10]. Dialogue, in its most basic form of conversational exchange, has been recognized as business critical from businesses like MasterCard (Mastercard Conversation Suite [11]), Nestle for creating shared value[12], Matel [13]. In computer science, dialogue has recently attracted increasing attention due to its promising potentials and alluring commercial values [14]. Chen et al. categorize dialogue systems into two groups: task-oriented systems and non-task-oriented systems, where the first aim to assist the user to complete tasks such as finding products, booking services etc. and the second interact with human to provide reasonable responses and entertainment [15]. Such task-oriented dialogue systems for e-commerce have been built successfully and have shown good results, as reported [14]. In addition, research in the conversational AI literature has explored the efficacy of automated

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dialog management and response systems using knowledge graphs [16], as well as the potential of conversational recommendation over knowledge graphs in e-commerce [17].

However, there hasn't been enough research at the intersection of dialogue, as explored in the area of human-computer conversation systems and dialogue as investigated in the area of marketing communications, and more specifically in relationship marketing literature.

## 2. Problem Statement

The effectiveness of marketing communications relies on the ability of marketing practitioners to connect to individuals (stakeholders) in a meaningful, context-aware way. However, this is no longer feasible without the help of a system that can serve as a content, relationship and data management system where knowledge can be explicitly sotred, discovered and shared. Such a system has to function as an enabler of a continuum of interactions in an information-intensive environment, as opposed to disconnected or insufficiently related records of discrete events of transactions. Functionally, such system should be similiar to what Rashi Glazer describes as a knowledge base [18].

The value of a knowledge base serving relationship-building has been shown by Glazer [18] and is illustrated in the following diagram:

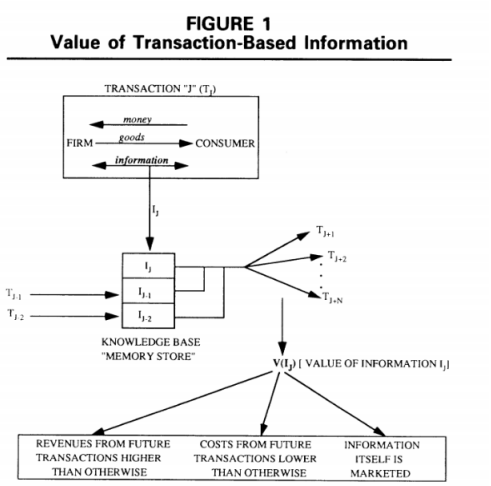


**Figure 1:** Value of Transaction-Based Information Rashi Glazer

For dialogic communication on the Web, not in the sense of human-computer conversation, but in the sense of building human-to-human long-term relationships, this is hard to build and maintain. Dialogic communication is highly dependent on knowledge-enabled interaction. And as such it is impeded by the increasingly competing content and competing metadata in the respective systems managing the content and the interactions. As Rockley [19] notes CMS, CRM and KM product competing metadata. Other major challenges for sustaining a continuum in the interactions with stakeholders are the disparate systems marketing information and records are stored in, the difficulty in accessing as well as the lack of environments for collaborative

knowledge-creation, critical for the the reflexive customer[20].

## 3. Research Questions and Objectives

This paper explores if and how a knowledge graph can effectively overcome the above described challenges and thus serve what is a necessity in today's cybermarketscape [21]: context-aware, information rich conversations and the decision-making related to them. Acknowledging cutting-edge research in the area of conversations enabled by human-machine interactions, this paper seeks to investigate the dialogic communication powered by knowledge-enabled customer relationship management systems [22].

The main research question in this study is "How a knowledge graph can be used to enable dialogic marketing communications?". In other words, how can marketing communications practitioners utilise knowledge graph capabilities to engage in dialogic communication. The reason such research is necessary is the growing importance of building long-term, meaningful relationships on the Web and the need for a technological solution that can underpin this endeavour.

## 4. State of the Art

### 4.1. Dialogue and Public Communication

From classical to modern era, dialogue has been central to the enquiry into human connection, meaning and understanding. Although understood and examined through different models[23], and without a solid shared definition of the phenomenon, dialogue is most often conceived through the concepts of exchange, ethical discourse, community.

On the plane of public communication, dialogue is seen as a process towards coherence[24], part of the inevitable heteroglossia in organizations[1], as the act of doing and being together[25], as an inevitable process in trade relations unfolding as a private business in the arena in the public space [4] . In public relations dialogue is theorized as key in ethical and practical approaches to engaging with publics[26][27][28].

Within these the paradigms of understanding from several areas in communication theory (interpersonal communication, organizational communication, communication with the Other) the process of dialogue overlaps with and drives tangential processes such as community building, value generation, knowledge creation, mutual understanding, meaning and interpretation experiences. Yet, dialogue is not always carried out by constructing a common field of meanings and finds expression in reaching a consensus. Very often, dialogue is not rooted in the idea of togetherness and enrichment of views, but in the utilitarian goal of information exchange, where meaning is fixed, formal, already reached and just being communicated, unambiguously.

It is here that it is necessary to distinguish dialogue as communication and exchange from communication, which takes place in order to transfer instructions. The way dialogue is explored in this paper is through its co-creation function that is in its brand co-creation aspect [29] as opposed to a dialog system capturing data and exchanging instructions, fed by a database.

### 4.2. The Dialogical Foundation of Marketing

Dialogic communication among marketing stakeholders is necessary for an enterprise to be an innovative social and economic contributor [5]. It is through a communication-based interaction that long-term relationships with customers are built and sustained. This is because customer's perception of relationships is holistic and cumulative [30] and lack of information or badly handled customer service scenario can destroy an otherwise good solution. Also, as channel choices in the purchase funnel affect one another because of lock-in effects and cross-channel synergies[31], consistent marketing communications across channels are key to developing enduring customer relationships, as opposed to "achieving exchanges in isolated transactions through the use of the marketing mix"[32].

In marketing, dialogue is also related to knowledge and meaning co-creation, where dialogic communication is achieved through consumer centric-approach[33], customer retention activites [7], relationship building and inter-organizational collaboration[32]. As Gronroos observes[30], continuing Guberson's research on long-term relationship building and the new marketing concept[34], customers feel genuine interest when they are involved in dialogic communication in which not only existing content is provided, but new content is created.

## 5. Knowledge Graphs From the Perspective of Marketing Communications on the Web

Marketing communications are the means by which a supplier of goods, services, values and/or ideas represents itself to its target audience with the goal of stimulating dialogue leading to better relationships [35] by conveying messages that are relevant and significant [36]. In information-intensive environments, building relationships online is important for organizations that want their messages to be greeted and reciprocated by stakeholders[9].Sophisticated customer databases, when used properly, allow for interactive, open dialogue and the creation of personal relationships with millions[37]. It has also been argued that knowledge management and customer relationship management show a high synergy potential in an integrated approach [38]. In addition to that, there has been discovered a potential impact of Social Semantic Web technologies in the directions of integrated offerings across channels, improved sales force efficiency and effectiveness, customized products and services and individualized marketing messages [39]. The conceptual basis under this intertwined use of data, marketing approaches and knowledge management systems have been laid by Hoffman and Novak who argued [40] that marketers must reconstruct advertising models for the interactive, many-to-many medium underlying the Web. Today, as marketing communications on the Web are competing with other content part of the information-intensive environment of the Web, their paradigms, strategies, and structures evolve and knowledge is becoming an asset in its own right [41]. So should the systems that underpin their creation and management.

Known for their capacity to enable applications for search, browsing, recommendation, personalization, advertisement, etc.[42], knowledge graphs are to be explored as systems for knowledge-enabled marketing communications. Knowledge graphs are already a business-critical element of the systems of many enterprises today, providing structured data and factual

knowledge to drive many products and make them more intelligent and magical, some of them (e.g. Microsoft's Bing knowledge graph and the Google Knowledge Graph) supporting conversational interaction[43]. Yet for the many different implementations of the knowledge graph paradigm within large enterprises such as Google, IBM, Amazon, Samsung, Ebay, Bloomberg, NY Times, Twitter [44], to mention just a few, it is still to be discovered whether the use of knowledge graphs can prove efficient for the discovery and utilization of marketing communications knowledge.

Knowledge graphs can potentially serve not only to power conversational systems, but also to organize and utilize knowledge and knowledge-related artifacts (to use the KM paradigm of decribing content) in away that would enable marketing communications professionals to lead information-rich, meaningful dialogue with contextual and relevant knowledge, pertinent to the person with whom they interact. For example, it could be that a knowledge graph can serve meaningful human interaction (as described in Sheth et al. [45] by ingesting (and interlinking) data from heterogeneous sources with unstructured data, such as customer reviews, emails, inquiries, comments, chats, eWom as well as other content such as blog posts, social media posts, ebooks, whitepapers, wikis, user-generated content.

## 6. A Knowledge Graph Use Case And Its Marketing Communications Implications

Recent research [46] showed that in tourism every major player has a knowledge graph and thousands of players need or want one because of the increasingly important role this technology plays in successful e-marketing and e-commerce. Among other real-world problems, solved by knowledge graphs are those in corporate knowledge management, healthcare and cultural heritage[44]. Below is presented one use case of knowledge graphs where content and data have been integrated in order to serve a better customer relationship built in a conversational platform. What follows is a hypothetical knowledge graph presented for discussion and enhancement.

### 6.0.1. A Knowledge Graph Platform Powering Conversational Platforms

It is argued that the creation of conversational interfaces that engage in human-like dialogues, calls for building knowledge graphs as a means for dialog-based access to information. Having defined four major steps of an overall process model ((1) knowledge creation, (2) knowledge hosting, (3) knowledge curation, and (4) knowledge deployment) Fensel et al. [46] outline three layers of different functionalities for a dialog (author note: it is important to distinguish between the emergent dialogue and the goal- and process-oriented one) environment, namely input, storage, output, conversational interface. There is also a built prototype for the tourism area, namely, touristic chatbots and voice assistants [46]. In the case of e-tourism application, such knowledge-graph-powered solutions integrate multiple sources of content, data, and services from various providers and to give information about hotels, bookings, events, weather conditions. From a marketing communications perspective, using chatbots to make voice assistants or any other dialog system smarter, means lower cost for using the product from the customer's perspective, meaning higher perceived relationship value. Also it means lowering

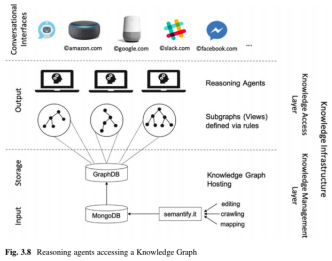


Fig. 3.8 Reasoning agents accessing a Knowledge Graph

**Figure 2:** Figure 3.5. from Fensel et al. p. 80 [46]

the cost for the creation of content from different platforms and decrease of the resources needed for the conversations management across channels. Last but not least, it means capacity to tailor content to the different stages of the customer journey (from information, to booking, to experience) by using contextual data for higher relevancy of the messages sent.

The opportunities the prototype opens for customer communication, while far from adhering to the principles of dialogic communication as a whole, present a starting point for planning for meaningful engagement with the user across various touch-points: e.g. Google Assistant, Alexa, etc. It is also through such a rich information infrastructure that a company can differentiate itself with richly interconnected content (integrated from static and dynamic sources and from open and closed data sources), serving as an immersive and interactive environment for engaging users.

## 6.1. A Hypothetical Knowledge Graph For Marketing Communications

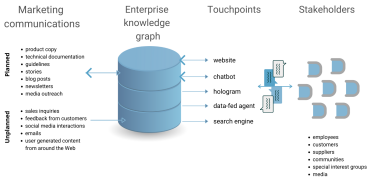


**Figure 3:** A hypothetical use case of a knowledge graph for marketing communications knowledge management and discovery

The above theoretical exploration of the knowledge graph use in managing the information flows and collaborative sense-making in the processes part of marketing communications activities, uses the typology of planned and unplanned marketing communication[47] to define the input in the graph.

The output in this model can be used to feed content across various touch points such as website, chatbot, search engine or any data-fed agent/platform. But more importantly in the case of dialogic communication, it can be a system used by marketing communications professionals to engage in meaningful conversations or create relevant marketing content, having the needed relevant and contextual information.

Such an envisioning of a knowledge graph used to drive and support decision-making and content production is not new, it just hasn't been considered, to my knowledge, as a tool for building long-term relationships. For example, research has explored the combination of existing data sources and computation and storage techniques into a flexible architecture for news journalism [48] . Knowledge graphs have also been considered for online marketing and direct sales [49] where research showcases their innovative practical application through a real-world use case: SalzburgerLand Data Hub: (http://data.salzburgerland.com) and its corresponding knowledge graph. Also, knowledge graphs have been successfully implemented for customer support, namely in claims processes, where knowledge graph-driven conversational agents assisted customers in the process of initiating a claim [50].

Similarly, a knowledge graph could hypothetically encompass all these aspects of organizational communication, which is also marketing communication. Content creation can be underpinned by knowledge about existing content and data. Customer service can also benefit from having context about the customer and their needs. A knowledge graph, build wit Linked Data can also integrate organizational data and content with facts, figures, social media data, reviews, Electronic word-of-mouth communication (eWOM) coming from customers.

For a knowledge graph to be created with that purpose, the following questions are to be answered:

1. What knowledge is needed for the creation of marketing communications content? (e.g. product copy, SME expertise, domain-specific knowledge, common-sense knowledge)
2. How is this knowledge being transformed during publication and distribution process? (e.g. from comments, shares, additional references to the content piece, comments from internal audiences)
3. What knowledge-related artifacts are created and how they are accessed by stakeholders. (e.g. blog posts, whitepapers, interviews, product specifications, product page copies etc.)

The use of "stakeholder" instead of a "user" or "consumer" here is to be understood in the light of Freeman's stakeholder theory [51]. This use helps seeing the strategic importance of the knowledge graphs in marketing communications, as not only a platform to cater to the needs of a person seeking to explore or buy something, but also as a platform allowing employees, customers, suppliers, communities, governments, special interest groups, media and their respective tools/software agents to navigate and use and most importantly to learn, co-create and cooperate.

## 7. Future Research Agenda

More research is needed at the intersection of dialogic communication for building relationships of value and the technological solutions that underpin efficient search, relevant content recommendation and immersive content navigation environments - all of which are part of the marketing communications processes.

The following questions emerge for future research:

- What are the barriers for adopting or tailoring an existing knowledge graph technology for marketing communications?

- Can a knowledge graph, being an architecture with interlinked content (e.g. product information, blog posts, eWom, comments) increase business value (i.e. decreased cost of customer acquisition and retention through timely, meaningful content), employee efficiency (decreased frustration, relevant customer service through access to rich, contextual information), customer satisfaction (i.e. better information accessibility, less frustration)?
- How existing strategies for improving marketing communications can be enhanced with a knowledge graph and what would be the change management cost of such an approach?

## 8. Conclusion

Expertise in information systems database management and other technologies is already crucial for marketers to help them constructively deal with increased information processing and analytical requirements [52]. So should the awareness of the knowledge graph technology as an architecture enabling the knowledge discovery of relationships between marketing communications content. As the Web threatened the orderly hierarchical world [53]the number and complexity of frameworks and architectures for communication with publics grew immensely, it is worth exploring the knowledge graph technology as an enabler of dialogic communication with stakeholders.

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