Knowledge Graphs and the Dialogic Potential of the Web

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In this paper, led by the research question "Can a knowledge graph serve marketing communications?", initially submitted as a poster to the Knowledge Graphs and E-commerce Workshop, I present findings of theory intersections in the fields of marketing communications and knowledge management, two use cases that show how data and knowledge graphs can be used for content creation and dissemination across platforms, and a model built to initiate cross-disciplinary discussion and research about the potential and plausible uses of knowledge graphs in certain types marketing communications on the Web.

CCS Concepts: • **Information systems** → Network data models; • **Social and professional topics** → **Socio-technical systems**.

Additional Key Words and Phrases: marketing communications, knowledge graphs, relationship marketing, dialogue

1 INTRODUCTION

As the Web threatened the orderly hierarchical world [3]the number and complexity of frameworks and architectures for communication with publics grew immensely, following the growth of the number of touch-points where companies meet their stakeholders. Waving corporate flags [21] and broadcasting one-way marketing messages became an anachronistic practice of the print and mass media paradigms. As part of the novel ways organizations connect to people on the Web in order to successfully engage in a long-term relationship with them, different theories and models emerged, the ones particularly relevant to the new "cybermarketscape" [31] being the dialogic PR theory [24] and the idea of connecting the concept of flow to marketing in hypermedia environment[20].

The rethinking of the process of meaningful, value-creating interaction in marketing communications on the Web calls for reevaluating the technological means for sustaining the shift from manipulating the marketing mix towards managing information flows. Both the concepts of two-way communication through better listening to customers and interactivity and the idea that communication before, during, and after transactions can build or destroy important brand relationships[9] need a technological backbone, i.e. a sophisticated system for interactive, open dialogue and better information plumbing [4].

Theoretically, as the primary reasons for the popularity of knowledge graphs is their capacity to enable applications for search, browsing, recommendation, personalization, advertisement, etc.[28], knowledge graphs (given the right technological pipelines such as NLP and text analysis) could be the answer to that need. Knowledge graphs are capable of ingesting (and interlinking) data from heterogeneous sources with unstructured data, such as customer reviews, emails, inquiries, comments, chats, eWom. And while it is known that there are many different implementations of the knowledge graph paradigm within large enterprises, Google, IBM, Amazon, Samsung, Ebay, Bloomberg, NY Times,

Twitter [16], to mention just a few, it is still to be discovered whether and if the use of knowledge graphs can or has affected certain types of marketing communications.

1.1 Background

This paper and the presented results are rooted in the broader context of my PhD thesis research where I seek to understand how marketing communications change in order to be relevant and adequate for the environment of the Web. Among the main theories that have informed my research so far are the Dialogic PR theory [22], the communication-based marketing model [9], as well as the view of the Web as a public sphere of emerging new social practices [8]. The main concepts I am exploring through the lens of these theories are relationships, content and data. It was the way these concepts work together and influence one another (both in practice and theory) that brought me to exploring the topic about knowledge graphs and their potential use for managing information flows for building long-term relationships of value at a lower cost.

1.2 Goal

By presenting initial findings about the question "Can a knowledge graph be used as a platform for meaningful dialogic marketing communications?", this paper aims to open a discussion and gather perspectives on the possible and plausible futures of marketing communications reimagined through the use of knowledge graphs.

1.3 Methods

With a view to the goal of this paper (open a discussion and gather perspectives) I will present initial results by:

- Listing discovered theory intersections.
- Putting two uses knowledge graph use cases in a marketing communications perspective.
- Present a hypothetical model of a knowledge graph used for certain types of marketing communication content.

2 INITIAL RESULTS

Below are presented the findings of theory intersections between the fields of marketing communications and knowledge management, two knowledge graph use cases and a hypothetical model of a knowledge graph integrating data from certain types of marketing communications.

2.1 Theory Intersections

Expertise in information systems database management and other technologies is already crucial for marketers for them to constructively deal with the increased information processing and analytical requirements [5]. So should be the awareness of the knowledge graph technology (very broadly said, an architecture built on the premise of linking concepts - products, specifications, properties, types of services, people etc. and conducting reasoning on the interlinked structures) and its relation to marketing communications and other tangent disciplines.

This is important because in the context of a networked society[6] , common value creation[2] and an empowered prosumer[29], marketing communication theories are to chart ways, inherently interdisciplinary [11], for communicating in an interconnected environment.

2.1.1 Relationship marketing. There is a substantial body of literature showing the place of knowledge in the meaning co-creation and communication-based marketing mostly in the field of relationship marketing.

The main threads running through relationship marketing theory are value through consumer centric-approach[12], customer retention [19], relationship building and inter-organizational collaboration[17], dialogues[30]. 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 [18] 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[25], 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"[17].

2.1.2   Marketing in hypermedia environment. In 1996 a seminal paper by scholars Hoffman and Novak [20] argued that new marketing approach in the hypermedia environment, which the Web is, is needed. Authors proposed a structural model of consumer behaviour that incorporated Csikszentmihalyi's concept of flow. What is relevant, in hindsight, to the inquiry about knowledge graphs is, on one hand, the constructed model and, on the other hand, the definition of hypermedia computer-mediated environment:

> We define a hypermedia CME as a dynamic distributed network, potentially global in scope, together with associated hardware and software for accessing the network, which enables consumers and firms to (1) provide and interactively access hypermedia content (i.e., "machine interactivity") and (2) communicate through the medium (i.e., "person interactivity").

Another article by the same authors is also worth considering when it comes to rethinking marketing communications through a knowledge graph and this is the article: A New Marketing Paradigm for Electronic Commerce [7]. In this article it is argued that marketers must reconstruct advertising models for the interactive, many-to-many medium underlying the Web. Such models must account for the fact that consumers actively choose whether or not to approach firms through their Web sites, and exercise unprecedented control over the management of the content they interact with.

2.1.3   The "berry picking" theory and the user navigating informational environments. Another strong intersection is conceiving of the user as information seeker navigating databases. There is a shift from a passive "audience" to an active user seeking information and "berry picking"[1]the content they need in order to solve a problem or find a particular experience. When we look at the user as an information seeker navigating databases, database design and search interface design inevitably enter the realm of marketing communications.

2.1.4   Database technology and relationship marketers. Database technology (functionally knowledge graphs can be understood as such) is also a point of intersection between relationship marketing, dialogues and data in the paradigm of knowledge management.

Sophisticated customer databases, when used properly, allow for interactive, open dialogue and the creation of personal relationships with millions[26].This also corresponds to the observation Bates[1] cites from Rouse and Rouse [27] about the need for systems to be sufficiently flexible to allow the user to adapt the information seeking process to his own current needs.

2.1.5   The Dialogic Potential of the Web. Before the Web has even begun to unfold as a thriving collaboration, trade and communication cyberspace, scholar Michael Kent pinpointed five principles to offer guidelines for the successful integration of dialogic public relations and the World Wide Web [23]. The principles are as follows: 1. Dialogic Loop; 2.

Usefulness of Information 3. Generation of Return of visits; 4. Ease/Intuitiveness of Interface; 5. The rule of conservation of visitors. The principles are intricately linked to a technology that is not based on the structure and the paradigm of print and mass media culture [20] but rather compatible with the "cybermarketscapes" [31] the Web contains. And they could be used as a strong conceptual basis for the design of a knowledge graph that can efficiently underpin meaningful marketing communications - ones that the user PULLs, not such that the user had been PUSHed

2.1.6   Knowledge management and customer relationship management . Knowledge management and customer relationship management show a high synergy potential in an integrated approach [15]. In addition to that it should be pointed that there could be 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 [14].

2.2   Knowledge graph uses cases and their marketing communications implications

Recent research [10] shows 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[16].

   Below I will look at two use cases of knowledge graphs where content and data have been integrated.

2.2.1   A knowledge graph platform powering conversational platforms. 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 and services in the tourism area, namely, touristic chatbots and voice assistants [10]. 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 this means lower cost for using the product from the customer's perspective, meaning higher perceived relationship value. Also it means lowering 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.

2.2.2   A Knowledge Graph for Innovation in the Media Industry. In the case of HAVAS 18 [16], researchers interconnect three types of data into a knowledge graph: core data (information from specialized sites), relationships data (information from Facebook, LinkedIn and Twitter), media coverage data (semantically annotated text from media coverage).

   From a marketing communications perspective this presents an opportunity for meaningful engagement with the user across owned and earned media channels. It is also through such a rich information infrastructure that a company can differentiate itself through a dialogue - having a graph with richly interconnected content can serve as an immersive and interactive environment for engaging users on the level of social media interactions, enterprise owned content and content from different other Web sites.

2.3   A Hypothetical Enterprise Knowledge Graph Model

To theoretically explore the knowledge graph use in managing the information flows of marketing communications, I will use the typology of planned and unplanned marketing communication[9], enrich it with content types of marketing

communications on the Web to further use them as input in a hypothetical model. The output in this model is used to feed content across various touch points such as website, chatbot, hologram, search engine or any data-fed agent/platform.

Something I would like to highlight from the model is the use of "stakeholder" instead of a "user" or "consumer". Exploring the user interacting with the knowledge graph (through various interfaces) as any stakeholder, as understood in Freeman's stakeholder theory [13] 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.
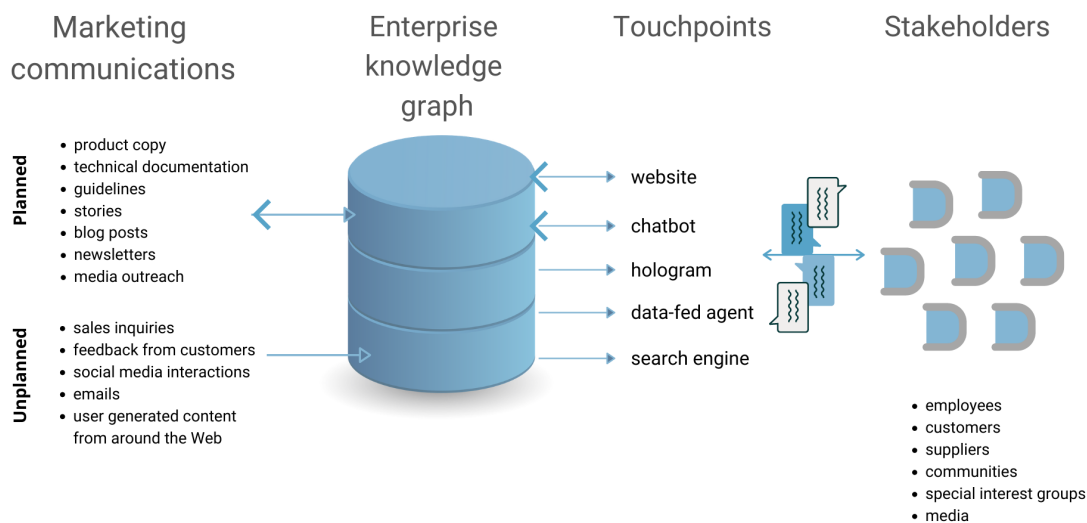

Fig. 1. A hypothetical use case of a knowledge graphs being deployed as a marketing communications tool

The model is intended to serve as a starting point for a discussion about challenges (both technological and organizational) related to extracting, interlinking, managing and reasoning on not only product data (transaction-oriented information and data) but also marketing communications data, i.e. interactional/relational-oriented information and data.

3 DISCUSSION

Based on the presented initial findings of intersections in the literature, if marketing communications are to seek a technological solution that will be relevant to the interconnected environment of empowered users, a change of direction is needed from push to pull, from manipulating the marketing mix to managing information flows, ultimately to dialogic exchange, to building relationships of value at a lower (perceived) cost.

Based on the two presented use cases and the marketing perspectives related to them, exploiting knowledge graphs in areas of e-tourism, and media KG prove to be a viable approach not only for data integration but also for engaging consumers with meaningful content.

Based on the hypothetical model presented, it can be argued that on a conceptual level, marketing communications can be thought of through the use of knowledge graphs, given it is possible for the technology to ingest data not only related to transactional exchange, but also to the interactions the customers have with the brand, its services and products and, most importantly, with its content.

4 CONCLUSION AND FUTURE RESEARCH

In a communication scenario of an empowered user "berry-picking" content in an interconnected hypermedia environment, a change of direction is needed from push to pull, from manipulating the marketing mix to managing information flows, ultimately to dialogic exchange, to building relationships of value at a lower cost.

This shift from push to pull requires two things:

- A change in the conceptual understanding of the "consumer" not only as a passive "audience" or segment, but as an active user seeking information and "berry picking" content on the Web.
- A change in the way organizations plan and execute marketing communications, that is a change from building information architectures to push marketing messages towards building information architectures to allow marketing communications to be pulled by the stakeholders.

Theoretically, as a data architecture, knowledge graphs are capable of ingesting (and interlinking) data from heterogeneous sources with unstructured data. However, it is still to be found out whether in practice a knowledge graph can also be used for creating and managing certain types of marketing communications content - its authoring, distribution and analysis. Some professional practices such as SEO (recently driven by and very related to schema.org) and content strategy (web content management being an integral part the practice) are to be taken into account too.

The following questions emerge for future research:

- Can a knowledge graph serve as a CMS (Content Management System) and for CRM (customer relationship management)?
- Can content modelling and data modelling be done in parallel?
- Would using knowledge graphs for certain types of marketing communications be cost-efficient?
  The questions are a matter of qualitative and quantitative research but above all their answers are to be sought in cross-disciplinary discussions that enable the transfer of knowledge from one discipline to another.

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