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Language, Power and Persuasion: The Case of Data Warehousing and Data Mining

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Abstract

This paper discusses the role of language and its power in MIS using examples of data warehousing and data mining. It also identifies the process by which language is used to create new lexicons in MIS. We examine the power of language to impress, to depoliticize and to routinize language dominance. Data warehousing and data mining are used to illustrate the power of language in the discipline of MIS.

Introduction

MIS as a discipline has numerous examples of using language to legitimize its status. Some of these examples have had a positive effect on the discipline. The papers of early MIS authors in the 1970's and 80's among non-MIS journals and periodicals, brought to the academic discussion table a picture of what the doctorate in MIS should look like (Davis 1982), a systematic picture of the discipline and its research (Davis and Olson 1985 ; Ives et al. 1980), and of its future (Davis 1992). However, language has been used to promote technology far beyond its capabilities, painting a rosier picture than was really possible (Dearden 1972), and unfortunately, there have been negative consequences of not living up to expectations.

We will start with a discussion of the power of language followed by an examination of the increasingly popular area of Data Warehousing and Data Mining which we will use as an example of how power through language has an impact on the discipline of MIS.

Power and Language

Power is a widely used concept for the analysis of social and organizational behavior. At the simplest level, one can distinguish between two senses of the concept: *power to* and *power over*. Russell captured the “power to” meaning by defining power as the production of intended effects (Russell 1938). In the positive sense, “power to” is the realization of personal or collective goals. In the negative sense, it is the hindering of other individuals’ achievement of goals for the sake of hindering. “Power over,” on the other hand, is the relational facet of power. For example, authorities may fail to gain obedience (Hamilton 1978), and “power to” can be instigated by those who initially do not have authority. Situations like this favor keeping the two senses of power conceptually separate. But in most contexts, both senses will coexist.

Researchers have recognized that language is the primary vehicle of persuasion (Gibbons et al. 1991 ; Petty and Cacioppo 1986), although nonverbal variables are clearly important as well (Burgoon et al. 1990). In MIS disciplinary forums (conference, publications, and networking), we are presented with many opportunities to be persuasive with language.

The enactment of influence and control, in turn, often produces antithetical side effects, where at one extreme, communicators may be totally unconcerned with the side effects; at the other extreme, they may be so concerned that they will abandon their influence attempts. Between the two extremes are varying levels of trade-off, as communicators endeavor to enact influence while preventing side effects or keeping them to a minimum. One way of achieving this is to depoliticize the influence message.

Essentially, to depoliticize an influence message is to camouflage it as something else; in doing so, communicators make their influence attempts more palatable to the targets of influence and at the same time lessen their own accountability. The use of language to depoliticize influence messages not only will make them subtler, but also may prevent or reduce resistance from the target.

It could be argued that in the early articles of MIS were masking their explicit intention to position the field of MIS as a legitimate discipline to other “traditional” business disciplines. In saying this, we do not imply that deceit or any other negative connotation is involved with respect to those authors or MIS, but that there was recognition of where MIS should be placed.

Language affects, and is affected by power relations between groups in society. At one level, the deprivation of power is often associated with psychological deprivation. At another level, powerful groups are better placed than less powerful groups in changing the language and having it accepted for general use. This has been most apparent historically when a country, after

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colonizing another country, imposes its own language on the latter. In some subtle ways, it contains features that favor certain ways of thinking but not others, portrays the powerful groups as the norm against which other groups should be evaluated, and trivializes subordinate groups, thus making them invisible in the language they know. In short, group dominance is transferred to, and encoded in, the prevailing language variety. Over time, the biased language is no longer marked—it becomes routinized; its use in daily discourse, in turn, helps to reinforce and perpetuate dominance—it routinizes power relations.

It is the routinization of language that has opened “science” up for critique (Lyotard 1982), and the discipline of MIS is no different. It has a dominant language, and groups that dominate the MIS language. Our desire to be scientists for example has prompted many authors to consciously include the word “empirical” in titles of papers for MIS journals and conferences, in what we believe is to legitimate the paper in the scientific method.

We do not intend to imply that routinization is negative, but to recognize that it has happened, is happening, and will continue to do so. It is important to have conscious reckoning of efforts to further routinize lexicon. All of these aspects of language, power and persuasion are normal. In other words, we all are subject to and instrumental in the perpetuation of this dynamic.

Our discussion thus far has focused on the theoretical background relevant to power and language. We will in the subsequent sections apply these concepts to the realm of DW/DM.

Data Warehousing and Data Mining

In the following sections we will identify and broadly define the lexicon used in DW/DM. We attempt to create a consistent understanding of the terms, tools and definitions involved with these technologies. In so doing, we will reassess the terms and concepts used in DW/DM and show the similarity these concepts have with traditional terms that have been used by MIS academics and practitioners for many years. In other words, what makes DW/DM useful is not necessarily the power of new technology. Rather, we argue that it is the richness of powerful metaphors associated with DW/DM that give practitioners utility of extant technology.

Data Warehouse

Inmon, the first person to define DW (Wallace 1994 ; Edwards 1994), defines it as “a subject-oriented, integrated, nonvolatile, time-variant collection of data organized to support management needs” (Castelluccio 1996). According to this definition, DWs are separate databases (Newing 1996) that arrange their information around major groups of subjects, such as products and clients. However, these subjects are organized in an integrated form.

Most of the technology associated with DWs is an extension of relational database management systems and client/server computing established in the 1970’s (Van de Hoven 1997). This is the technology that allows the creation and integration of data resources in a repository with certain file structures that provides different views of data according to the characteristics of the problem to be solved (Champion and Moores 1996 ; Lewis et al. 1995).

Despite the fact that small companies are releasing new generations of “breakthrough” multi-dimensional database management systems for DW without the limitations of current structures (Greenfield 1996; Prince 1996; Imielinski and Mannila 1996), most of the database management systems used for DW are traditional products. Several big companies have been attracted to the DW/DM market. Most of these new products or new releases of existing products are based on traditional tools that have been sold by these companies for a long time. One example is the DW extension of Microsoft’s SQL Server (Leon and La Monica 1996). Another is IBM’s new tool called “Intelligence Miner” (Gerber 1996 ; Kalin 1996) that operates with the traditional DB2, defined by IBM as its main store for DW solutions (Watterson 1996).

Data Mining

“The process of extracting valid, previously unknown and ultimately comprehensible information from large databases and using it to make critical business decisions” (Newing 1996). The main assumption behind DM is that sophisticated statistical and artificial-intelligence-related techniques can identify patterns, relationships and rules in the data that are not visible with traditional techniques (Newing 1996).

In adding several techniques to the task of extracting information from databases, DM provides a metaphor and an umbrella that aggregate techniques present in the business environment over several years. Statistical techniques and neural networks have been sold as business tools for 20 years (Newing 1996). It is possible to find neural networks applications from medical uses (Baxt 1990) to bankruptcy forecasting (De Almeida 1993). Techniques such as discriminant analysis, clustering, and factors analysis have been proving themselves as useful tools in both business applications and academic research in business. With DW/DM these techniques become more visible to business managers, and, as a consequence, the investment and clarity about their need are both better defensible.

Discussion

We can find several reported cases of success in the use of DW/DM in business applications. British Airways, for example, has been using these techniques with a benchmark perspective (Bird 1996). Wal-Mart used DW/DM to discover relationships between the sale of specific products (Bird 1996).

There is no doubt that DW/DM may become useful tools for companies. However, the same components have been successfully used for several years even without any label. The main concern is the depoliticization of these technologies as “revolutionary” and “silver bullets” to impress and influence top management and to become routinized in language of IS professionals. The upswelling of literature and professional gatherings related to DW/DM in the last three years, coupled with the adoption of this lexicon among vendors is a testament of this phenomenon of routinization and depoliticization.

DW/DM are neither revolutionary nor “silver bullets” because they are mainly aggregations of previous existing tools under a single name (Davydov 1996 ; Blass 1996 ; Teach 1996). Competent companies will have successful applications while many others will fail in taking any profit from these technologies (Alexander 1996). In this sense, DW/DM has served business by providing a revival of several techniques that were not related before and creating a reassessment of the need for good projects, good definitions, and good management.

Effect on MIS Discipline

There are many MIS researchers who contend that part of the development of our discipline relies on a cumulative tradition (Ackoff 1967 ; Dearden 1972 ; Keen 1980). As part of that tradition we need a dynamic language with numerous static terms from which to share a common lexicon (Babbitt 1997). It would be counterproductive to replace the terms around for example, the IT domain of iterative design, by creating a new set of terms which give the impression of a new, distinct IT domain (Papineau 1979).

According to Keen (1980), one of the most problematic issues in the field MIS is the absence of a cumulative tradition. One basic problem here is the divergence in research operationalized in the field and the lack of consensus about basic definitions such as “information” (Keen 1980).

At the same time, the attention to the technologies of DM/DW make MIS stronger. We believe that the emphasis on DM/DW brings to the forefront in the minds of business the usefulness of previously unconsidered available techniques. The language of DM/DW gives this suite of techniques credence in the authority structure to allow for the adoption of these approaches. Finally, the attention that comes with DM/DW has the additional benefit of raising the importance of the MIS function within the organization.

However, when we examine statements such as “a data warehouse can transform your business” (Humby 1996) we must ask ourselves if the pattern of unfulfilled promises regarding the revolutionary transformation of business using information technology is not repeating itself again. Might the DM/DW path lead us down yet another avenue that has the potential to bring yet another set of credibility problems to our field?

Conclusion

It is normal across all disciplines to impact and be impacted by its language, as a young discipline MIS is still formulating its core lexicon. The opportunity to vigilantly develop a coherent set of terms will significantly impact academic knowledge accumulation and practitioner management and investment of new IT.

This paper has articulated a dialogue about the tradeoff’s associated with the language of an emerging technological stream of research. It is clear that we should be cognizant of the potential benefits and difficulties of changing the language of the technology, given the issues of consistency and the desire for a cumulative tradition as Keen has warned.

References

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