ENQUIRIES REGARDING WORKPLACE INTERACTION FORMAL LANGUAGE

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ABSTRACT

The main objective of the paper is to describe an employee's social network interaction using natural language. Previously, Wittgenstein's philosophy of language describes the limits of formal language and recommends the use of natural language by investigating how it is actually used. The methodology used was based on the analysis of the general features of Wittgenstein's philosophy of language in relation with human resource job requirements. The result of the research shows that in business rules design, we need to use ordinary language looking for context, activities and practices in which we use language that provide the fundamental clarification of meaning. The implications of research can help managers and developers create better decision support systems (DSS). The originality of the research consists in shifting from language as a product of thought to language as a meaning by which we think in business.

KEYWORDS: *natural language, business rule, decision support system, business logic, employee's social network.*

Introduction

Management is about business objectives, people and civil society (i.e., management is about stakeholders short-long term interests). Businesses, organizations and institutions are social products and their existence is morally defended by their social mission (i.e., they have a social stability function). At the organizational level, we have to design a stakeholders' mechanism for communication. This mechanism is nowadays *corporate social network*. Organizations also have deployed information systems that work as a scaffolding mechanism for employees to deal with complexity. Complexity determines the spirit of twenty-first century science. The expansion of the universe, the evolution of life, and the globalization of human economies and societies all involve phase transitions of complex dynamical systems (Mainzer, 2007, p. VII).

How does language actually works?

Language is the general method by which human intellect can depict its existential environment, be it real or virtual. Clark sees language as a tool that alters the nature of the computational tasks involved in various kinds of problem solving (Clark, 1997, p. 193); it also enables us to reshape a variety of difficult but important tasks into formats better suited to the basic computational capacities of the human brain.

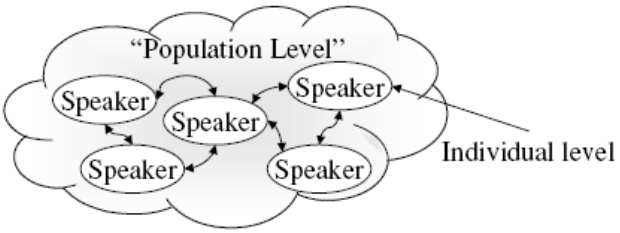

Figure 1: Language can be considered at both the individual level (the knowledge and performance of an individual) and the population level (the linguistic conventions in a population). There are feedback loops between individual's language and language conventions of the population, making the whole a complex dynamic system (de Boer, 2006, p. 385).

As human beings we are socially dependent, so we have a social behavior (Evans, 2007, p. 81). Human intellect refers to the common capacity to think. We can state that communication is formed by the human intellect capacity to think and these thoughts can be expressed by language. In this essay we analyze language in information and management system.

The main concern of the philosophy of language is with *how we mean what we say* – how does language actually work? Blair states that there is a 'sharp boundary between understanding language and cognition' (Blair, p. 3). Wittgenstein suggests that 'language is itself the vehicle of thought' (Wittgenstein, 1953, p. 107e).

What is meaning?

Meaning is the result of the statement. From a statement or a group of related statements we can appreciate: determinacy of sense, intellectual content, representational bottleneck, and scaffolding mechanism. Wittgenstein writes that 'the meaning of a word is its use in the language." Meaning can sometimes be explained by pointing to its bearer'. (Wittgenstein, 1953, pp. 20-21e). Words encode basic concepts and hence, allow for the more efficient processing of information and knowledge. Conceptualization allows for the creation of more words and new metaphors to achieve still higher levels of conceptualization and representation. Concepts and words form a dynamic systems bootstrap creating the conditions for their mutual and dynamic development (Logan, 2006).

Wittgenstein: Ordinary vs. Formal language

Wittgenstein thought that 'all the propositions of our everyday language, just as they stand, are in good logical, order.' I can understand his point as that any change in language use will diminish language beauty; we may focus on context, activities and practices in which we use language that provide the fundamental clarification of meaning we are looking for (Blair, 2006, p. 7). Blair argues that Wittgenstein's work is relevant to the study of information system because he focuses on how natural language is used in different context, activities and practices that provide the fundamental clarification of meaning.

Wittgenstein is breaking away from two powerful traditions in the study of language:

The "referential" view of language;

Meaning aspires to definiteness.

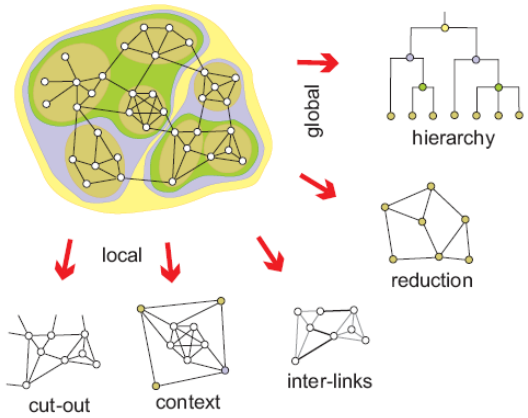

Figure 2 Approaches to deal with large networks (Batagelj & Mrvar, 2008, p. 4).

Frege, Russel and early Wittgenstein believed that ordinary language could never have the determinacy of sense necessary for philosophical analysis; ordinary language could never be the language of philosophy. In information systems, this view means that ordinary language cannot assert facts that could lead to computing algorithms. Based on this appointment, Data Model for information systems has gained wide approval and recognition.

Later Wittgenstein stated that precision in meaning is not a property of words but may vary in different circumstances.

Corporate social network

Organization is a product of society; it is a form of social behaviorism. From a bureaucratic perspective, organizations are rigid structures that operate under certain rules in order to deliver objectives' completeness; standardization of work-place requirements and a tree form of organizational social network. From a stakeholders/post-bureaucratic view, organizations are open structures that contribute to satisfying a social need; flexible work-place requirements and a 'city' form of organizational social network. Businesses, organizations and institutions are looking at their stakeholders as a community of individuals whom they try to build a long term relationship with (Latendre, 2008).

Corporate social network, as a structured environment, can be viewed like a teacher-learner social interaction (Mague, 2006). Learning is creating a new concept, or modifying an existing one. Technological features of virtual worlds (e.g. Second Life, MPK20) and frame four affordances – self-expression, co-experience, co-creation, and crowd-sourcing – that support attributes of communities of practice for tacit knowledge exchange (Goel, Junglas, & Ives, 2009, p. 182).

Workplace language

We distinguish corporate relations based on *internal regulations* and respectively based *on shared values* that are promoted in-outside the company (e.g. PR, CSR). Common knowledge occurs in philosophy, linguistics, and economics as a prerequisite for coordinated action (van Benthem, 2008, p. 38). We can view any organization like a hierarchical social network. We describe organizational social network interactions between different categories of stakeholders:

- Subordinate – subordinate interaction based on data retrieval model;
- Manager –subordinate interaction based on data retrieval model;
- Manager –manager interaction based on document retrieval model;
- Expert –manager interaction based on mixed: data and document retrieval model.

Any particular interaction takes the form of conversations and involves all the basic operations from sequential programming (van Benthem, 2008, p. 44); and is based on

employee's scaffolding mechanism. Today's employees' requirements are: thinking capabilities for *search* and *inference* (Baron, 2008, p. 6), use of technology for learning and communication (Junglas, Johnson, Steel, Abraham, & Louglin, 2007), use of wikis and forum-oriented platforms in the workplace (Majchrzak, Wagner, & Yates, 2006), tacit knowledge transfer mechanisms (Goel, Junglas, & Ives, 2009, p. 188).

Scaffolding

Scaffolding denotes a broad class of physical, cognitive, and social augmentations—augmentations that allow us to achieve some goal that would otherwise be beyond us (Clark, 1997, pp. 194-195). With scaffolding we can create an architecture that uses a certain combinations of resources to deliver the desired output. The assigned combination is based on rational choices. Blair says that 'our minds are not objective, independent rational choice calculators, but are pattern completers "embedded" in our daily activities' (Blair, 2006, p. 274).

Scaffolding activity is limited to human intelligent capacity overload. Clark has identified the means by which language can reduce scaffolding complexity: notational systems (e.g. mathematics, logic), specialized languages (e.g. biology, physics), lists and schedules, memory content (diaries, notebooks) (Clark, 1997). So, comparing employees' scaffolding mechanisms we can appreciate that there are no significant differences. The crucial role is attributed to tacit knowledge. Intellect content is limited by semantic indeterminacy of meaning in natural language. We search for information to use in activity or practice.

Business rules in ordinary language

The idea of connections between business rules and ordinary language is based on business process tracing used by business analysts in order to develop a Data retrieval System. The main practices for process tracing are: (1) interviews, (2) use of archival data, (3) hypothetical scenarios, and (4) individual differences. All of these techniques are based on ordinary language.

Usually business rule engines are based on a data retrieval model because the very nature of a computer program is context-free. Our thoughts and their 'meaning' cannot be understood without reference to context and circumstances (Putman, 1991) (Wittgenstein, 1953, p. 82e).

RDR (ripple-down rules) uses a rule-based exception structure for knowledge representation (KR) and an incremental, rapid and user-driven KA (knowledge acquisition) and maintenance technique that combines the use of cases and rules (Findler, 2003, p. 174).

Business analysts make their decisions in designing business rules based on belief persistence: (1) elastic justification, (2) value conflict, (3) accountability, (4) stress, and (5) groupthink.

Kasabov argues that in modeling social, political, and economical systems we may use gradual fuzzy rules. The limitations of this approach are overcome by the neutrosophical approach.

Taxonomy of fuzzy rules (Kasabov, 1998, pp. 192-196):

- Zadeh-Mamdami's fuzzy rules: *IF* x_1 *is* A_1,*AND* x_2 *is* A_2 *AND…AND* x_k *is* A_k *THEN y is B*;
- Fuzzy rules with confidence degrees: *IF x is A, THEN y is B(with a CF)*;
- Takagi-Sugeno's Fuzzy rules: Rule i: *IF x is* A_i *AND y is* B_i*, THEN z is* $f_i(x,y)$;

- Gradual fuzzy rules: based on fuzzy representation of gradual properties. These rules are very useful for modeling social, political, and economic systems (Kasabov, 1998, p. 195).
- Generalized production rules with degrees of importance, noise tolerance, and sensitivity factors: *IF $C_1(DI_1)$ AND $C_2(DI_2)$ AND…AND $C_n(DI_n)$, THEN A_1, A_2, …, $A_k(NT,SF, CF)$*;
- Generalized production rules with variables: fuzzy proposition can have a variable in the place of the fuzzy value;
- Recurrent fuzzy rules: *IF $x_1(t)$ is A_1 AND $x_2(t)$ is A_2 AND $y(t-1)$ is B_1, THEN $y(t)$ is B.*

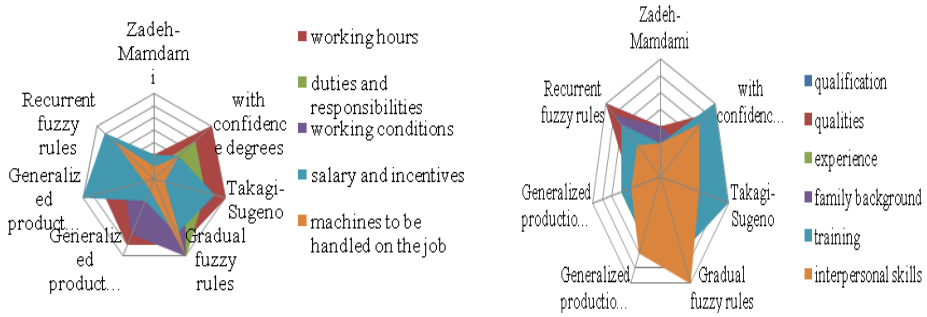

Figure 3 What rule Business Analysts use job description and job specification

Using gradual fuzzy rules means that we need to understand and to communicate to increase the common sense reasoning at work. We have analyzed issues regarding job description and job specification in order to understand human resource workplace one-to-one interaction based on personal scaffolding mechanisms. Our analysis shows that in soft issues we may use gradual fuzzy rules that are more suitable for social interaction (e.g. working conditions, duties and responsibilities, interpersonal skills).

Ordinary language in DSS

In the second half of the twentieth century, human attention has turned to the automation of natural language processing. People now want assistance not only in mechanical, but also in intellectual efforts (Bolshakov & Gelbukh, 2004, p. 16). Decision support systems are complex scaffolding mechanisms that allow managers to make better decision. Inference mechanisms in decision support systems are based on fuzzy rules architecture (Tran, Abraham, & Jain, 2006). Inference is the process of problem solving and is achieved using natural language. We can sustain that in designing new DSS, we have to successfully combine the data and document retrieval model to increase the intellectual content of the decision making process. Natural language computing can become more efficient if we create opportunities for employees to cooperate in order to create paths for social efficient problem solving approach. It is advisable to focus on the meaning of words and the evolution of language. There are many different techniques that are suitable for modeling the evolution of language. Most of these techniques can be divided in three categories: optimization techniques, genetic algorithms and agent-based models (de Boer, 2006, p. 389).

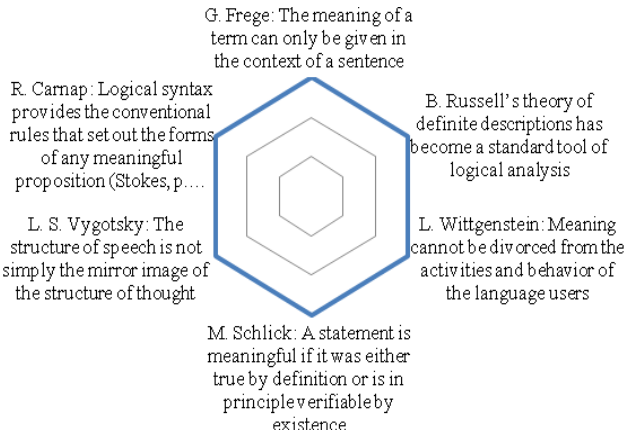

Figure 4 Meaning of a word in natural language computing

Conclusion

I truly believe that management as a modern discipline may develop by incorporating many new areas of interests (e.g. biology, psychology, and physics), but with all this external influence we may get confused about what practices may bring the desired output.

New business practices arise from the organizational field and are based on stakeholders influence, and determine certain restrictions.

Computers are, fundamentally, "logical machines" and the attempt to get them to handle language in "meaningful" ways is similar to philosophers' attempts to represent meaning in language using formal logic.

New perspectives in document retrieval system and scaffolding mechanism alows for new way of natural language computing in business rule approach to business. The actual trend of cloud computing is based on stakeholders' contribution to business and can be based only on natural language.

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