Quantitative/Qualitative Question Trees

G. Alaz MERIC

Laboratory for Computational Ontology, MODSIMMER
Middle East Technical University
guldenvealaz@gmail.com; alaz.meric@metu.edu.tr

INTRODUCTION: Questions have a fundamental role in human and natural sciences. Many fields in human and natural sciences explore their subject matters through different kinds of questions. The team of the Ontology of Questions aims at providing a philosophical analysis and categorization of questions (except rhetorical and ironic ones), from different academic areas. Our categorization is based on certain properties such as linguistic patterns, formal structures and semantic representations. As a result, we devised a taxonomy of questions formed by several trees. These trees are composed of a root node which describes what kind of questions is focused on, and the sub-branches are specializations of the root node. Our ongoing project aims at defining a complexity score for questions pertaining to scientific and academic studies, based on the number of steps that are followed in order to reach an answer to the question. It should be emphasized that we are not concerned with the answer to the question itself but with the effort to reach this answer. If the complexity level of a question is too high, it means that this question cannot be answered with today's technology and resources.

LITERATURE AND METHODOLOGY: The main resources we used in our research are Clardelli, Groenendijk, Roelofsen [1], Hintikka [3], Hiz [4], Walton [7], Collingwood [2], Prior and Prior [5], and Wisniewski [8], in order to focus on the linguistic, philosophical, informational, and logical aspects of questions.

My part of our work categorizes questions in terms of being immeasurable and/or context-dependent, and measurable. As a result, a *Qualitative/Quantitative Question classification* has emerged. This classification if formed by two trees, one for **Qualitative Questions**, and another for **Quantitative Questions**.

Qualitative Questions address a subjective point of view which is credible in a context that is observer dependent, context dependent, modifiable across contexts [6]. The corresponding branch has several sub-branches: **Value-based, Norm-based,** and **Characteristics.** Value-based qualitative questions address intrinsic or extrinsic unwritten principles of behavior, and this sub-branch has two further sub-branches: **event-based** which concerns actions and behaviors, and **element-based** which focus on the individuals or particulars such as the actor or the doer of an action, or a patient. Value-based questions can be subcategorized as: **figurative**, if they represent what something symbolizes; **literal**, if they address the properties of inanimate beings; **proper**, if they address specific individuals; and **conceptual**, if they address common nouns. All those four kind of questions can also be categorized as: elementary, if they ask information about one entity; comparative,, if they take two entities into consideration; and superlative, if they deal with more than two entities.

Event-based questions can be **ethical** or **political event-based**. Examples of ethical event-based questions include: "Who is the most active celebrity in philanthropy?"

(figurative and superlative); **"Is it good to ban alcohol consumption after 11 pm?"** (literal and elementary); **"Does Johnny feel himself responsible to his students as much as Tim feels?"** (proper and comparative); or "Is euthanasia a kind of suicide?"; (conceptual and elementary). Examples of political event-based include: **"Are democrats more successful than conservatives?"** (figurative and comparative); **"To what extent does the media affect people's consumption patterns?"** (literal and elementary); **"Who is the most successful prime minister in the history of the UK?"** (proper and superlative); and **What are the general principles of good governance?"** (conceptual and elementary).

Element-based question examples include: **"In what sense do impressionists differ from expressionists?"** (figurative and comparative); **"What makes this work of art beautiful?"** (literal and elementary); **"Is Bruce Willis good looking?"** (proper and elementary); **"Which mathematical proof is the most beautiful?"** (conceptual and superlative).

Norm-based questions address written principles of behavior which are applied in specified fields and have three branches: legal, religious, and governmental, since these are the strongest motivations under ethical traditions. Examples are: "In which countries is euthanasia allowed?" (legal), "Is getting a tattoo a sin?" (religious), and "Who makes federal laws?" (governmental). Questions of characteristics address to distinctive marks belonging to any class or individual. This sub-branch has two sub-branches: **organizational** and **individual**. While the latter refers to personal characteristics, the former focuses on a group of people part of an institution or an organization. Organizational subcategories reflects the organizational theory of Weber [8], and are subdivided in; **Pre-bureaucratic** questions, which are about totally centralized organizations (e.g. "What are the main characteristics of a patriarchal family?"); **Bureaucratic** questions, which are about complex and large scale organizations with clearly defined roles and responsibilities and hierarchical structure (e.g. "What are the main responsibilities of the Ministry of Education?"); **Post-bureaucratic** questions, which are about organizations constituted through dialogue and consensus (e.g. "What are the priorities of Amnesty International for starting a petition?"). Individual: "What makes a physician annoying?"

Finally, quantitative questions, which belong to the second root node, search for standardization, exact measurement and numerical, symbolic and semiotic data., e.g.: **"How many kilometers are equal to a mile?"** or "What does Σ sign stand for?"

References

1. Clardelli, I, Groenendijk, F., Roelofsen, J., Inquisitive semantics: a new notion of meaning, Language and Linguistics Compass **7** (2013), 459-476.
2. Collingwood, R. G., *An autobiography,* USA: Oxford University Press, 1939.
3. Hintikka, J., *Inquiry as Inquiry: A Logic of Scientific Discovery*, Selected Papers vol.5, Dordrecht: Kluwer Academic Publishers, 1999.
4. Hiz, H., *Questions*, Reidel Publishing Company, Dordrecht: Holland/ Boston: USA: D., 1978, Introduction, pp. IX-XVII.
5. Prior, A. & Prior, M., Erotetic Logic, *The Philosophical Review* **64** (1955), 43-59.
6. Shenton, Andrev K. (2004). Strategies for ensuring trustworthiness in qualitative research projects. Education for Information 22 (2004), 63–75
7. Walton, D., The fallacy of many questions: On the notations of complexity, loadedness and unfair entrapment in interrogative theory, *Argumentation*, **13** (1999), 379-383.
8. Weber, M. (1947). The Theory of Social and Economic Organizations. Henderson, A. M., and Parsons, T. (trans.) New York: Oxford University Press.
9. Wiśniewski, Andrzej (1996). The logic of questions as a theory of erotetic arguments. Synthese, 109(1), 1-25.