

Letter to the Editor

Computers Could Help to Comprehend Countries

Countries are bordered stretches of land with politically organized people. Whereas “area” is a vague concept, referring to a region of a country (e.g., the Bible Belt) or of the world (e.g. the Middle East), or to an interest/study domain (e.g., area of law), “country” stands for a territory, for a nation-state, where passport holders belong to. A country is a complexity of complexities delineated by its boundaries (frontiers) and surrounded by its environment (foreign countries). It is not an aggregate (*Gesamtheit*) but an intricate, structured, history-molded, culture-soaked, goal-directed whole (*Ganzheit*), a set consisting of a multitude of interdependent elements. Having emergent properties that are irreducible to the properties of its constituent components, a country is subject to upward and downward, outward and inward influences. Like an organism, it is adaptive and constantly changing. In its innermost core, a country is held together by information, being allegedly a form of energy.

A country is a unit to be investigated interdisciplinarily, at different though linked levels. It is a dynamic system of dynamic systems (political, legal, economic, financial, social, cultural, etc.) to be systematically compared with other dynamic systems (countries), all of them constituting the suprasystem euphemistically called “Family of Nations” (e.g., the United Nations). If the ambition is to “com”-prehend a country, we need scientists with profound knowledge in a particular discipline and proficiency in communicating with neighboring “T-shaped” experts, for no country student can be master of all pertinent sciences. Each and every country is an *individuum*, something that cannot be divided without losing its identity. Like the elaborate pattern of a carpet that cannot be seen by the ant, the convoluted pattern of a country cannot be perceived by the political, military, legal, or literary scientist, the economist, sociologist, linguist, ecologist, or other scientist working (alone or with equally narrow-minded colleagues) at his/her stovepipe faculty, school, or department. A joint and concerted effort, well-managed scientific collaboration is needed.

With the fields of artificial intelligence, data mining, machine learning, knowledge organization, and soft computing rapidly expanding, the important question arises whether computers could be helpful in understanding the situation in, and development of, a country, the necessity of which needs not to be emphasized in the age of globalization. The answer to this question should be

positive. For it is clear that considerable improvements on the work of Paul Otlet, pioneer of library science (*UDC*), are now possible.

- Myriad books written about small, medium-sized, and large countries are stacked in libraries that are being digitized. These libraries could be searched computationally.
- Books on a particular country could be ordered by year/month of publication, or publisher.
- Indexes could be integrated; entries could be systematically cataloged by (sub)discipline or topic, and listed in order of frequency; technical terms/expressions could be clarified by organizing them; contents could be synoptically outlined (schemes of concepts or keywords).
- National and personal (*curriculum vitae*, university education) data on authors, contributors or translators could be sifted out and orderly mapped.
- Quantitative data could be collected and subjected to statistical analysis.
- A master bibliography could be alphabetically or thematically compiled and kept updated.
- IT connections could be made with existent databases somehow related to the country.
- Computationally visualized patterns (networks) or trends could suggest further research.

Computers could “help” to understand countries, but on their own they will not (and will probably never) be capable of such understanding. This is (and might always remain) the preserve of critical, creative human beings interacting with the machines. The reason for this still inherent deficiency of computers is a fundamental one. The universe of discourse, the universal set including, but not limited to, the subsets we are accustomed to thinking in and speaking about, is unknown. There is no “meta”-classification, no generally agreed upon general theory of classification or clustering, no “master algorithm” (Domingos 2015). At the current state of ontology, nobody knows how to sort, or logically sequence, big data without remainder. No one knows how to rummickub all classifications. Not yet, but the quest for the ultimate learning machine (the holy grail of computer scientists) goes on unabatedly.

The vexed ontological problem has to do with the—since the glorious years of the Vienna Circle (1918-1938) somewhat neglected—question how the sciences (usually divided into natural, social, human, and formal sciences)

hang together; a question hard to resolve, because there is a fault line between (the sciences of) nature and (the sciences of) culture. Other than what Julien de la Mettrie, Francis Crick, Patricia Churchland, Margaret Boden, and Dick Swaab want(ed) us to believe, man is more than a machine. Each of us is a duality, a coin with two sides. We have—like the Roman god Janus—two faces. Mind (*Geist*) and body (*Körper*) are inseparable from each other, nor can they be identified with, or reduced to, one another. We are not only embodied; we are also embedded, socially (*Mitwelt*) as well as environmentally (*Umwelt*). We are profoundly connected. “No man is an island entire of itself” (John Donne).

Scientific collaboration (teamwork) will be greatly facilitated by e-science, by combining:

- Vast quantities of digitized data (digital libraries),
- Supercomputers running sophisticated software and mapping the dynamics of S & T, and
- High-tech computer connectivity (cyber-infrastructure, cloud computing, semantic web).

IBM Watson is currently disrupting industries with cognitive computing. In collaboration with prestigious universities and research institutes in the United States, it is building machines to extend the power of human beings using

them. All those involved in the ambitious project have high expectations. “Deep learning,” the felicitous concept introduced by Rina Dechter in 1986, is making giant strides. “Deep learning libraries” such as Caffe, CNTK, ConvNet, DeepNet, EBLearn, Gnumpy, Keras, MxNet, and Torch have come in. Even quantum computing is alleged to be seen on the horizon. Be that as it may, technological singularity, the subject Raymond Kurzweil has been famously speaking about on several occasions, only “seems” to be near. While the problems of mankind are mounting dramatically, the struggle for political power is taking place on a global scale and whole civilizations are clashing, the really big challenge is: comprehending countries by computers. Cross-pollination among different disciplines is needed to “let hundred flowers bloom.” The stakes are high, higher than many people may care to think!

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Reference

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