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The Academic Concept Reconsidered: Plato, Leibniz, Xanadu and the NetAcademy

An outline (draft)

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1) Generating Knowledge - The Historical Context

Arguing about cognition and establishing orders for knowledge has been a noble tradition in philosophy since reflection was born¹. Congregations of wise men got established at specific places² as a means to discuss and teach knowledge. Plato's academia, Aristotle's Lykaion, the monastery schools, the hence arising universities (since the 11th ct.) and, since the Italian Renaissance beginning in the 15th ct., the academies³. They all eventually established conventions about the *processes of academic acknowledgement* for the scientific community. Measures to guarantee scientific quality in accordance with established methods have been developed referring to the academic career, to exams and titles, to quality assessment processes, to reviewing, publishing and intellectual property rights etc.

Since reflection and philosophy began, the focus was on the topics: How to foster, how to manage knowledge?. Let us refine this quest by three issues:

- What are its criteria for categorization?
- What are its criteria for validity?
- What are the successful methods to accomplish order?

In the western world it was at the Greek philosopher Plato's academy (founded 386 b.c. in Athens, being closed down by the Christian emperor Justinian 529 a.d.), that the first principles of systemizing knowledge and the first methods to generate knowledge were elaborated. These principles were:

- Establishing a **repository** for shared knowledge, aiming at an encompassing accumulation of knowledge (encyclopedia translates as: an encompassing circle for education);

¹ As Bruno Snell [Snell 1980] states, reasoning about knowledge started in ancient Greece since their language has the unique characteristic to build abstract terms, which philosophy surmises.

² In fact, the term „academia“ denotes the name of a hero (heros Academos) after which the place was called where Plato and his disciples met. Thence the name for „academy“.

³ The Acaemia Platoica, founded 1474 in Florence Italy, was a revival of Platos ancient academy concept and the first of a row of subsequently following academy foundations, among them the Académie Française in Paris (1635) and the Royal society in London (1660). They initiated the Age of enlightenment, scientific disciplines and schools of engineering.

- Establishing an **academy** for the scientific community, i.e. regular congregations for wise men to reason about knowledge and abduct new knowledge by doing so;
- Establishing a **method** to ensure congruent reasoning.

These principles have been valid until today. They met with face-to-face discussion, with writing, printing and with digitized communication. They are incorporated in academic teaching, in libraries, in conferences on congresses and in information management systems, as today the internet. They are developed on the base of the old academic principle which requires that there is a common understanding of terminology, that there is agreement about the methods to assess the truth of statements, and that all processes of such research are open to all interested parties.

2) Displaying Knowledge – Encyclopedic Endeavours

The discussion about knowledge requires the following processes:

- Accumulation
- Discussion (Review)
- Update
- Continuous archiving of the findings (encyclopaedia)

Encyclopedia means a compendium of knowledge⁴, either general or specialized, focusing on one field of interest.

The first and most important aim of Encyclopedia is to document and maintain authentic knowledge, ensuring and testifying its preservation over time and space.

Secondly, it is to provide adequate categorization and systematization of knowledge, ensuring easy access on knowledge for any interested person. For this objective, there are various different approaches to structure i.e. classify knowledge, e.g.,

- in a *pre-established order* (as in the artes liberals, in religious instruction, etc.), or
- in a *hierarchic classification* (as Carl Linné used in his category system for biology and zoology), or
- in a *alphanumerical list* (as is the case in common dictionaries), or
- in a *ranking order* according any given preferences and value judgement (and, as such, due to variation).

Third, it is important to provide for the methods (rules, processes of assessment) according to which “truth” can obtained, according to which teaching, analysis and classification of knowledge are performed. Along with the concepts of the encyclopedia and of the academic procedure there was a continuing reflection and quest for a general method to assure congruent reasoning about knowledge.

⁴ Encyclopedia are often compared to dictionaries. While a dictionary is basically devoted to words, an encyclopedia refers to data on and discussion of each subject covered. An almanac is a periodical publication containing much ephemeral data.

- **Plato**, one of the most famous ancient Greek philosopher (427-347 b.c.) was convinced that only *mathematics* could offer certainty in the ocean of the arbitrariness of reasoning about truth. He is said to have erected an inscription on the gate of his academy saying: "any one being ignorant of mathematics must remain outside" ⁵.
- It was **Leibniz** who introduced the constructive or operational component which allows a systematic development of knowledge⁶. He turned the discipline of logic into a discipline of mathematics by substituting „truth“ with: „proven by calculation“.
- The edition of the famous encyclopaedia of **Diderot** and D'Alembert ("Dictionnaire raisonné des sciences, des arts et des métiers...", 1751-1772) was a new milestone in the quest for archiving universal knowledge, as it involved the best (French) scientists to contribute definitions of their field of expertise.
- New discoveries in mathematics in the 19th and 20th century (Norbert Wiener, Emil Post, Alan Turing, Erich von Neumann...) brought other dimensions of calculation and of automation. Digitalization, new information and communication technologies, brought new possibilities to exchange knowledge in the scientific community worldwide. The internet, in its first restricted emergence as ARPA net in the 1960s, made mathematicians and philosophers dream new possibilities about the quest about knowledge and truth. Vannevar Bush (As we may think) made Ted Nelson (Computer Lib – Dream machines) envision the possibilities of a worldwide accessible library out in the space, filled with documents about our world. Nelson called his virtual territory "**Xanadu**". Alas, it was Tim Bernes-Lee who, in 1989, furnished the specifications to fulfill this dream – the **world wide web**.

3) Where are we today?

What has come out of this until today? What are the answers of the World Wide Web to research?

At the time being, the internet is simply collecting what is there, and these contents can be searched by search engines who do not "know" what is rubbish and what is quality, or: does the information retrieved answer the question of the person who put in the search. There are various endeavors to install semantic systems based on the new ICT. It is still the triumph of traditionally edited publications and dictionaries to guarantee a quality level by ascertained review processes. Whereas, in open media as the internet, the preeminent doubts lie with the "three R-questions":

Retrieval: How can the information (or knowledge) be found – I know it must be somewhere, but where to look for? This is the question about access management (for a long time a political issue) and about metadata management in information systems.

⁵ [Whithead 1947]. Being aware how deeply Plato influenced Western philosophy, the American philosopher Whitehead stated that "almost the entire European philosophy is but footnotes to Plato".

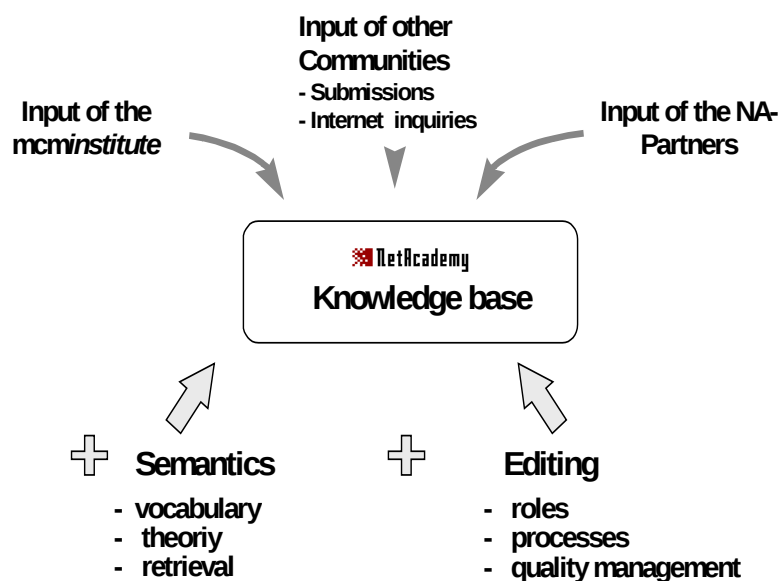
⁶ Gottfried Wilhelm Freiherr von Leibniz, German philosopher and mathematician, 1646-1716, founder of the Preussische Akademie der Wissenschaften in Berlin, 1700, is the ancestor of computational logic. [Peckhaus, 97]

Rating: How can I be sure that the document I found is serious information, is “true” in the academic standard? This is the question about review methods and procedures.

Reliability: How can I be sure the source I found will stay i.e. can be cited and verified by others, today and also later? This is the question about archiving, i.e. information systems such as libraries.

At the University of St. Gallen, Switzerland, Prof. Beat F. Schmid pursued the idea of a global academic semantic network. Based on the world wide web, this network should allow for a targeted retrieval of definitions, of experts, and of documentation about scientific research. It should be truly interdisciplinary – being able to combine relating topics coming from different research disciplines. That platform, the **NetAcademy** [www.netacademy.org], went online in march 1997, as prototype. On the one hand, it accumulates, disseminates and reviews academic content and, on the other hand, explores the potential of the new media in a self application. The USP of the NetAcademy concept consist in

- its quality management (editing, reviewing, archiving of contents) and
- in the ambition to eventually create a display of knowledge which is networked in a semantic structure (Schmid develops the respective software, called Quantor). An “understanding” query function is the objective, a sort of semantic world wide web in the area of academic research.



Have a look at the NetAcademy, “live” since March 1997 [www.netacademy.org].

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