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By Tiziana Terranova

When we told **Tiziana Terranova** about our sustainable publishing diagram (Mute19), she asked whether we'd heard of the the 1975 'onNLine System'. Here, she explains why today's knowledge management systems are yesterday's news. On the right, a visual parallel she sent us: O'Reilly's Linux work model.

[IMAGE]

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Douglas Engelbart's NLS (oNLine System) appeared to have died in 1975, when federal funding into networked, intellectual team work dwindled and XEROX Parc's computer scientists shifted the paradigm to a 'one user one computer' model. NLS was an advanced file-sharing, multimedia system which allowed users to communicate by means of shared, visual displays of information. Conceived as a working tool for intellectual collaborations, Engelbart's NLS was based on a fundamental, cybernetic intuition: the nature of intelligence does not exclusively depend on or originate from the individual capacities of the human brain. Intelligence is a cybernetic system that Engelbart named the "H-LAM/T system" or "Human using Language, Artefacts and Methodology in which He is Trained." Engelbart dreamed of a total system "of a human plus his augmentation devices and techniques... This field constitutes a very important system in our society: like most systems, its performance can be best improved by considering the whole as a set of interacting elements rather than a number of isolated elements." <1>

Engelbart understood from very early on that the process of thinking could no longer be modelled on that of the isolated genius and that computers could be much more than simple number-crunchers or static memory banks. The increasing amount of information available and the increasingly complex nature of the problems faced by intellectual work demanded an internal reconfiguration of the H-LAM/T system. For Engelbart, any intervention at any level of the system would automatically engender, through a system of feedback loops, a resonance which would propagate and challenge the whole structure. Even the simple introduction of a low-level capability like text-editing and word-processing was bound to alter the overall structure of thinking, freeing up a surplus of labour which could be qualitatively reinvested in the process.

NLS was eventually funded by the Information Processing Techniques Office (IPTO) which implicitly tied up research into augmentation with existing research on time sharing (Engelbart Augmentation Research Centre was one of the first original nodes of ARPANET, another key project funded by the IPTO). In 1964, the IPTO provided Engelbart with a million dollars a year to run a time-sharing system and half a million dollars a year for his augmentation research. With time-sharing, and following Engelbart's encounter with Peter Drucker's work, the emphasis shifted to intellectual team work, which the ARC team identified with the future of knowledge work. The ARC was an infinitely hot and dense 'dot' comprising all the components that would later disperse into the far, but connected galaxies of the digital economy: an 'engine room', where the new time-sharing computers were located; a hardware workshop, where the constantly upgraded computer system and experimental input-output devices were built and maintained; and, as Howard Rheingold states in his book *Tools for Thought*, a model "intellectual workshop that consisted of an amphitheater-like space in which a dozen people sat in front of large display terminals, creating the system's software, communicating with each other, and navigating through dimensions of information..."

An intensive open source workshop, NLS conceived of its users as the ‘designer-subjects’ of the experiment. Using the system meant being involved in its evolution, a machinic enslavement which was also a new mode of subjectification based on higher-than-ever levels of positive, transformative feedback. Pioneers of open source and burn-out syndrome, the ARC team would be tested to the limits by the creative destruction of proliferating positive feedback loops. Tools for Thought describes how, at the end of the project, a psychologist had to be brought in to consult on “those parts of the system that weren’t to be found in the circuitry or software, but in the thoughts and relationships of the people who were building and using the system.”

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<1> Engelbart, Douglas C. (1963) ‘A Conceptual Framework for the Augmentation of Man’s Intellect.’ in Paul W. Homerton and David C. Weeks eds. *Vistas in Information Handling. Volume 1. The Augmentation of Man’s Intellect By Machine*. Washington Dc: Spartan Books and London, England: Cleaver Hume Press, p. 5.

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