

## Gerotechnology: An Interdisciplinary Perspective and the Global Networking Dynamics

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*Gerotechnology: An Interdisciplinary Perspective and the Global Networking Dynamics. Gerontechnology 2002; 2(1): 60 - 62.* The wide scope of gerontechnology requires involvement of many scientific disciplines because of: (i) the focus on applied practical issues; (ii) the new interface of two megafields that are typically diverging. The field of Technology and Aging includes many subfields. To be more precise: The scientific and practical discipline of gerotechnology or 'gerontechnology', constitutes a conglomerate of a number of diverse disciplines that are typically more or less autonomous fields of research and/or application. However, the very nature of these seemingly self-contained fields, such as biomechanics, cognitive engineering, cognitive psychology, ergonomics/human factors, demands input from other fields that may not be traditionally associated with their respective core disciplines.

The 'gerotechnological' umbrella polydiscipline itself is characterized by: (i) a very pragmatic need to focus on practical issues, as well as marketability in rapid work cycles, (ii) a requirement for rigid quality standards of science in development and evaluation of products and services, and (iii) a continuous need to combine two domains that used to be traditionally wide apart. Roughly defined, the first of these two domains or 'megafields' is associated with disciplines such as the engineering sciences, architecture, and design. The other megafield encompasses the more 'traditional' gerontological disciplines such as the social and behavioral sciences, medicine, and biology.

### MEGAFIELDS

Both megafields by themselves are already challenged by the needs to accommodate a large array of sometimes competing, related subfields and neighbouring practical and scientific branches within their respective content boundaries. In addition, they are also confronted by the requirement to interface in

an efficient and effective fashion. This calls for the development of a common professional language and mutually acceptable methodological criteria, the establishment of collaborative work contexts, and the existence of broad and inclusive infrastructures for communication and information dissemination such as specialized and multi-purpose conferences, symposia, colloquia, workshops or concrete goal-oriented, and interfacing media such as newsletters and scholarly journals with an acceptable science impact. Many more decentralized opportunities must be available than existing at present to meet, to discuss, to compare, and to match and/or combine empirical results, methods, constructs, models, theories, as well as material and immaterial resources. In summary: Synergetic effects in science can rarely be consciously planned – in formative stages, they depend on growth of diverse endeavors in research and practice, on a multiplicity of outbranching activities from heterogeneous origins, and last-not-least on the interest and the goodwill of the main players in the con-

suming, funding, manufacturing, research and development arenas.

## **MULTIDISCIPLINARY OR INTERDISCIPLINARY**

Two of the key terms that are quite often conditions sine qua non for a successful gerotechnological activity are interdisciplinarity and multidisciplinary. While often used interchangeably, it is useful to draw a distinction between the two, borrowed from industrial and organizational psychology: 'Multi'disciplinarity refers to an additive division of tasks; members or work groups from different disciplines work in parallel, and their respective products are considered intermediate results that build a whole once matched with and adapted to the products of their alter-disciplinary counterparts ('everyone contributes to the best of his/her knowledge and the pieces are put together afterwards'). In contrast, 'inter'disciplinarity aims at a parallel, interlocking, collaborative working style; such an approach involves a continuous interchange of members and work groups from different disciplines throughout the development, testing and revision stages. It needs to be emphasized that (with the definitions above in mind) interdisciplinarity may seem to be the more ideal approach, but sometimes multidisciplinary division of tasks is the preferable and not infrequently necessary venue, for instance if the subtasks are highly specialized. I.e., interdisciplinarity is not an absolute goal. Rather, it serves as a guiding principle to remind professionals that they need to acknowledge potential gaps in their work that can be addressed by professionals from other disciplines during the most critical development and testing stages. This is perhaps most important at the planning phase by defining the ultimate goals and specifications by which a final product or service will be characterized and ultimately evaluated.

## **TOWARDS NETWORKING**

First steps toward this goal of interdisciplinarity involve global networking, most often

in the form of professional umbrella organizations that embrace many different fields. Still, these organizations tend to be confined to one of the two megafields although they do not describe themselves as guild-like exclusive. Networking dynamics that develop through the use of modern information and communication technology, are also promising ventures for achieving the kind of interdisciplinarity required by Gerontechnology.

These two main topics -- interdisciplinarity and networking -- are illustrated by usage of the World Wide Web (WWW) by senior citizens. Different disciplines adopt different techniques, different criteria, and different goals. The main authority for officializing WWW development criteria, but also for developing accessibility guidelines is the World Wide Web Consortium (W3C, [www.w3.org](http://www.w3.org)). The W3C does not only set the language standards for the Web, it also hosts the Web Accessibility Initiative ([www.w3.org/WAI](http://www.w3.org/WAI)) that is most relevant for the elderly, although it mainly addresses needs of the disabled. Some of (many) cooperating key research groups can be identified. These include the Trace Center at the University of Wisconsin-Madison ([trace.wisc.edu](http://trace.wisc.edu)), the Technology Resource Centre at the University of Toronto ([www.utoronto.ca/atrc](http://www.utoronto.ca/atrc)), and the Rehabilitation Engineering and Research Center (RERC) on Universal Design at Buffalo ([www.ap.buffalo.edu/lercud/](http://www.ap.buffalo.edu/lercud/)), University at Buffalo, State University of New York. RERCs are sponsored by the US Department of Education through the National Center of for the Dissemination of Disability Research ([www.ncddr.org](http://www.ncddr.org)) and encompass more than ten RERCs.

The two prototypically presented modes are rarely found in a pure form; most networking schemes are made up of a mixture of the two. These two main topics -- interdisciplinarity and networking can be illustrated by examining usage of the World Wide Web (WWW). Different disciplines adopt different

techniques, different criteria, and different goals. Some focus on interactive system design, others on designing interactive systems. Efforts toward quality control are seen for instance in access to health information; others' concern is more on the issue of health message composition, based largely on social-psychological and health psychological theory.

## **USABILITY**

The multi-faceted concept of 'usability' of the web is not as clear-cut as it may appear - there are multiple notions of it within a semantic space that includes terms such as universal access, intuitive navigation, input

and output device issues, aesthetics to counteract boredom, regulators' and providers' imposed constraints, participative design or user-centered design, and system development.

Research groups clustering around the WAI represent just one of many web-usage-relevant networks - and this infrastructure is heavily dominated by the technical domain of the two megafields outlined above. Networks and their dynamics, as well as concrete examples of inter- and multidisciplinary in the gerotechnology of web usability will be described in a future issue of this journal or elsewhere.

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