Dr. Bernd Kulawik / Werner-Kälin-Str. 13 / CH–8840 Einsiedeln / +41 79 672 06 16 / be_kul@me.com

From Hierarchy to Network
The internet's development 'back to the future' and its meaning for administrations

Today, ICT in administration and commerce more or less still imitates the established paper-based processes with its digital means: we create documents collected in folders, organised on desktops and manipulated locally with dedicated programs. Also databases still imitate their paper ancestors, the archives. The same seems to be true for the hardware level: Institutions maintain servers to store data, and even the usage of *clouds* is still nothing more than that of an external server providing the *documents* stored in databases. – Could – and should – this be the future of ICT in administration? I don't think so.

The growing computing powers we have – literally – at our hands (from smartphones to desktops) equals that of the supercomputers from the early 1990s. But their usage has started to change how we think of software: It is no incident that the programs on handhelds are not called *word processors* and the like anymore, manipulating files locally and storing them here or there, but *apps*, which closely intertwine manipulation and storage of data locally *and* remote. And: These data are no documents anymore. The cloud-based part provides large amounts of data, calculating power for more complicated tasks and storage. The processing and storage of data is mostly shared among our handhelds and their *mother ships*.

To me, this is a sign of what I would like to call a transition *back to the future* of the internet and the WWW: When their developments started around 1970 and 1990, respectively, all computers participating in these networks held more or less the same status: They worked as server and clients simultaneously. With the growing amount of data, especially with the WWW, it seemed natural to establish the hierarchical client-server-architecture we still use today – imitating the traditional paper world where institutions host and publish the data and users have a somewhat sub-ordinated position in this hierarchy.

I think, this will change everything rapidly: Every handheld today can (and does) function as server *and* client, as a connecting point in P2P networks, or as part of large, distributed storage networks. This development will accelerate: The internet will extend into a set of networks of equal clients, interconnected almost constantly and serving as tools that process data via *apps* in *collaboration* with servers that could be substituted sooner or later without a distinct hierarchy. This, as I would like to show, has important implications on how administrations work with 'users' and their data and archive them.

Curriculum vitae

2013 ETH Zurich, gta Institute for the History and Theory of Architecture, research project *Study of antique architecure around 1550 in Rome*

2010 Bibliothek Werner Oechslin, Einsiedeln: architectural historian, IT administration

2006–2008 Karman Center for Advanced Studies in the Humanities, Berne: administration / IT

2001–2004 Bibliotheca Hertziana, MPI for Art History, Rome: database development

2002 TU Berlin: PhD (art history): Drawings for St Peter's in Rome

1996 TU Berlin: MA (musicology): *Seconda prattica – the Italian madrigal around 1600*

1986 TU Dresden: Physics (4 semesters)

Relevant Publications (more on www.bibliothek-oechslin.ch/stiftung/team/kulawik)

2010: From Top-Down to Network: Long-time Perspectives of Scientific Publication / EU-COST conference *Networked Humanities: Art History in the Web* (Chair: Prof. Hubertus Kohle)

2010: A distributed Web-Portal for World-Wide Collaboration Among Architectural Archives and Historians / Conference *Hybrid Architectural Archives*, NAI, Netherlands

2009: The Technical Session / Conference *The Pantheon in Rome*, Berne, Nov. 2006

2004: ZUCCARO – ein universelles Framework für netzbasierte Forschungsdatenbanken in den Geisteswissenschaften (mit Martin Raspe) / ICHIM 2004 *Digital Culture and Heritag*, Berlin