

# The man who made 'auditing through the computer' possible - Meet the inventor of ACL

By: S. Ravichandran

Hartmut (Hart) J. Will is Professor Emeritus of Accounting, Auditing, and Management Information Systems (MIS) in the School of Public Administration at the University of Victoria. He is the inventor and developer of ACL and Founder of ACL Services Ltd.



ACL has revolutionised the audit profession's approach and Hart Will's contribution to the cause of audit globally and regionally has indeed been phenomenal.

UAE-IAA in conversation with Professor Hart Will....

## **Kindly elaborate on the circumstances under which ACL was invented...**

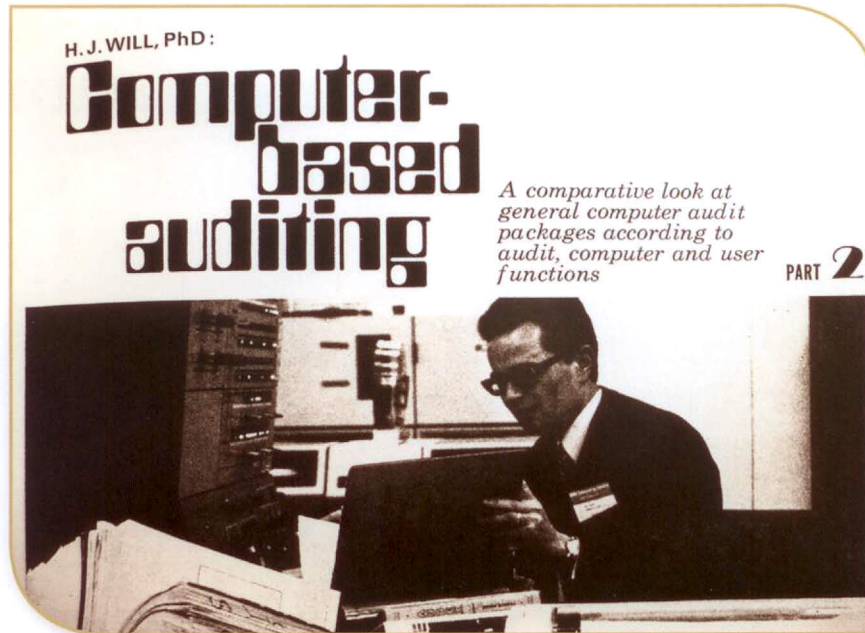
It was a series of moments that started in the 1960s that led me to explore the concept. In my Ph.D. thesis that initially began at the Free University of Berlin in Germany in 1964 and finished at the University of Illinois at Urbana-Champaign in 1968, I had invented a Management Information Systems (MIS) framework consisting of a Data Bank and a corresponding Model Bank. After having developed courses along these lines at the University of British Columbia (UBC) in the Faculty of Commerce's Division of Accounting, I decided to apply my framework to an analysis of all available audit software packages because audit practice and theory were still based on auditing around the computer. The Canadian Chartered Accountant published the findings in 1972. Upon reflection I felt that the available batch-mode software was insufficient to support the internal and external audit profession and that a standardized system was needed

that could be implemented on all relevant computer systems and applied in various cultures.

So I designed a generalized audit command language (which was the precursor to ACL software) with two sets of commands for data bank and model bank audits. Coincidentally, an invitation arrived to submit a paper from the Gesellschaft für Informatik (GI) in Germany. The paper was accepted and I delivered it in 1972. I stressed its meta-linguistic nature vis-à-vis computer-based data and information. This language could be viewed as a "funnel" for computer applications, regardless of the programming language used. Immediately, this struck a chord with researchers from Gesellschaft für Mathematik und Datenverarbeitung and led to sabbatical invitations for me. They were working on a meta-data model which was to make data access convenient for "flat" files, hierarchical and network data structures and relations. I had immediate reinforcement of my concept and decided to concentrate on the meta-language aspects of ACL in order to assess and audit relevant data applications, including those for accounting and audit purposes.

## **What became of the concept, how was it developed into what it is today and what was your role in it?**

Since I had access to an interactive computer system at UBC, the audit command language program became the first interactive audit software. We demonstrated the first version at the 1973 Conference of the Canadian Information Processing Society in Edmonton, Alberta, in teleprocessing mode, since the data and the system "resided" in Vancouver, B.C. By demonstrating this language wherever possible, and continuing to apply for research funds, I kept going to develop and refine the audit command language. At this point it started to become the ACL product as it is known today, both as an ad hoc investigative system and a design system for automated, repetitive audit applications. It was



implemented on various computer systems (mainframe, mini and micro) in Canada and Germany. I served as architect, confidante, fund raiser, innovator, missionary, and promoter for this vision of audit analytic software both in Europe and North America.

**How did various communities such as auditors, IT professionals and others react to such a tool immediately after your invention was publicized?**

Although impressed by ACL, many auditors thought that it was ahead of its time because they could only use audit software – if at all – in batch mode as part of a pre-planned audit program. It did not have the flexibility it has today and did not allow for multiple iterations. Many could not or would not recognize the quantum leap forward with ACL’s interactivity as an interrogative and self-correcting language for asking critical questions, for conveniently following up on the latest findings and for testing any kind of data and information syntactically, semantically and pragmatically.

In the beginning, IT professionals were still developing and supporting mostly batch data processing applications; however, many of them felt threatened when they saw how easy it was for auditors to check data in their systems and how many mistakes one would find.

It took almost 15 years to develop the original concept into the commercial product we launched in 1986. Its ultimate success will continue to depend on proper development and marketing of the product and related services.

**Looking at what ACL is today, what are your impressions vis-à-vis the early stages of ACL?**

I will comment separately on ACL the product and ACL the company.

Much has changed since the early days of ACL technology, both with internal audit’s mandate and the technology used to achieve it. In response to changes such as increased management demands, the audit paradigm is shifting from the traditional cyclical approach to a continuous and risk-based model. As a result, ACL technology now delivers a range of capabilities, varying by the size and sophistication of the audit organisation and enterprise, and scales for ad hoc analysis, repeatable automated procedures, and continuous auditing & monitoring.

In terms of the ACL business, the commercial operation began in 1986 and it continues to strengthen and grow; I’m pleased to have been able to maintain my focus on my academic career, while the business was, and continues to be, built by an impressive, evergrowing team of dedicated people who deliver incredible value.



**About the author:**

Ravichandran is the Manager of IS Audit & Continuous Monitoring in the Internal Audit Department of Emirates Group. He is an MBA, Certified Information Systems Auditor (CISA), Certified Information Security Manager (CISM), Certified Information System Security Professional (CISSP), Certified Quality Analyst (CQA) and ACL Certified Data Analyst (ACDA). He is also the Past President of ISACA UAE Chapter.