

# 1EPOS-VIRA, 3RIP AND PARALOG – PREHISTORY AND EARLY STAGES

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This story which was prepared for the anniversary commemoration of Paralog (first made available in The TRIP family History 1970-2001, a CD made for Paralog's 25th Anniversary summer of 2001, a total of 50 copies distributed only to the project's participant) is told as I remember it, assisted by various documents at hand and by answers from some of the participants.

## Prelude

In 1967 I was a student at the Royal Institute of Technology – KTH 2 and should by then have finished my studies in Technical Physics. I had taken an interest in computers and had swapped a number of courses so that I could take all the computing courses available at that time. I had also taken an interest in information storage and retrieval; I had realized that it probably was more fun reading (a lot about) research than doing it - the physics and similar stuff at least. Little did I know then, that 15 years later I would be heading a research laboratory.

In the summer of 1967 I had for the second year a temporary employment supervising the process of selecting new students for all the Swedish institutes of technology using a computer-based system to match and rank student applications and grades to available places at the institutes. The work which consisted mainly of transforming grades and applications to machine readable form and of sending out printouts, receiving answers, and preparing for new batches was taking place in the meeting rooms at the ground floor of the Administration building of the Royal Institute of Technology - opposite to the library.

## SDI - IDC

Sometime during the summer or early fall I found out that the library was looking for two people with a science or technology background to work as documentalists/information officers<sup>3</sup> in a project on computerized information services - Selective Dissemination of Information (SDI). I applied and on October first Malin Edström and I (both on a half time basis) and Kerstin Bengtsson (later Wessgren) started working at the library - KTHB. The project eventually evolved into the Information and Documentation Center – IDC-KTHB.

I have no recollection of when I first met Rolf Larsson. It must have been sometime before the first week of April 1968 because then we both participated in a course on Information & Documentation held at KTHB. Among the participants was also Erik Sundström, later to become the first expert in IR-questions at the Swedish Agency for Administrative Development.

## Interlude

Rolf was the first holder of an Information Retrieval scholarship at KTHB (I'll use the term SF - short for SINFDOK fellow - to designate the holders of such a scholarship, since it was SINFDOK - the Swedish Council for Scientific Information and Documentation that funded all the other SFs). Erik Sundström who got the other IR fellowship at the same time as Rolf, was, however, not affiliated with KTHB but with Ingenjörvetenskapsakademien - IVA (the Academy of Engineering Sciences). Both Erik and Rolf were funded by Teknikvetenskapliga forskningsrådet - TFR (the Swedish Council for Technology Research). After Erik and Rolf there were no scholarships for a few years. SINFDOK was established in the budget year of 1969-1970 with Fredrik Backlund as head, and took up the fellowship practice in 1970 resulting in the appearance of Mats G. Lindquist.

Björn Tell, who was the Head librarian at KTHB, somehow managed during the following years to affiliate a number of people on SINFDOK Fellowships to KTHB. Some of the reasons must have been that at that time there were in Sweden only a few places working in the field. Information retrieval was not a recognized academic subject, and the experimental SDI service started at KTHB in 1967 (and before that at the Studsvik Atomenergi library) provided a continuing base both for systems development and for experimenting under real life conditions. This service existed as a hybrid of fee-based services and grant-supported developments for a very long

time, from 1967 to 1978-1979, and after that as a purely fee-based service until 1997. In 1976 the center had to justify its existence and the evaluation report, assembled under great pressure by all who worked at the center at this time, received by chance the number 1066 in the library reports series (ref.1) i.e. the ominous date of the Norman invasion of Britain, a deed never to be forgotten by its authors.

Once a small, critical mass of youngish, eager and bright (qualities guaranteed by the SINFDOK fellowship screening process!) people were assembled it was probably only natural for the later ones to join. Björn Tell was in 1973 appointed Head librarian at Lund University Library and Stephan Schwarz became the new Head librarian at KTHB.

In 1972 Mats Löfström and Jan Carlsson were appointed SFs and spent their first year in England at Sheffield University (where computerized indexing of chemical compounds was being developed at the time).

Bo Göransson, now professor at KTH in the faculty of Industrial Organization- was probably appointed as SF in 1973, but although we did interact frequently he did not participate in the developments at IDC. Joining the team in 1974 Göran Thorén developed KOMPOST - A Compression Method for Structured Files (implemented by Jan Sunneback), and later worked on security issues producing PROTECT - A Security Device for System EPOS.

Lars Höglund appointed in 1972 (I believe) and Olle Persson in 1975, both affiliated with the Department of Sociology at Umeå university, were closely related to KTH at the time. They made together a. o. a very extensive study on the use of SSCI. Lars occupies now the first professor chair in information science research at the University of Gothenburg

In 1970 it was also time for me to finally finish my studies at KTH i.e. by producing a Master's thesis with the title "A computer program for the identification of significant changes in citation frequency." Christer Bryntesson who was at the time an assistant at the Department of Information Processing - ADP (Automated Data Processing) was somehow found and employed to do the programming, resulting for his part in a technical report (ref.2) - - and in the contact with the others in the gang at KTHB..

Bosse Johansson, who joined the project group in 1972 resisted until 1989 before leaving IDC-KTHB and re-joining the team that by now had created its own computer firm under the name of Paralog. Janne Sunneback joined the project group in June 1973.

Jan Hultgren who had an employment at the Department of English at the Stockholm University was recruited by Rolf Larsson. They had both been studying at the University in Lund.

To complete the list there was also Jon-Erik Nordstrand, who was appointed in 1974. He did not participate in the work on 3RIP, but focused on library automation and is now Library Director at University College of Borås, after having occupied similar posts at the University of Umeå and University of Gothenburg..

## EPOS-VIRA

One of the first contributions Rolf made was to implement on an IBM 360/75, the ABACUS system that had been developed and used at AB Atomenergi.

The earliest document I can find where Rolf is an author, is co-authored by Björn Tell and Rolf Lindh (a programmer employed by AB Atomenergi, where Björn had been the head librarian). The paper is on searching literature with a general ADP-system. Overview of ABACUS. Second phase: the search part (ref.3). ABACUS was an acronym for AB Atomenergi Computerized User-oriented Services where the library was participating in the international nuclear information collecting network – first NSA then to become INIS- and processed the tapes received in exchange for that contribution.

After ABACUS a better and faster batch retrieval program called VIRA was developed by Rolf and Jan H. VIRA was named, I think, to allude to the card game Vira (which legend has it is named after the iron mill Vira), to Rolf's dog named Vira, and as an acronym for Voracious Information Retriever and Advertiser.

The first search- profile handling program after ABACUS was called PROSA and at that time input was by punched cards. When a system was developed for interactive input of search profiles it seemed natural to call it EPOS.

The EPOS-VIRA system was very successful and was provided for use to CNRS in France in exchange for the PASCAL tapes. It was also used in Portugal at the National Research Council as a result of a SIDA-supported information co-operation project.

As said above the software served for many years and was used in the Nordic countries by a network of information centers both public and in enterprises, providing regularly individual users with the result of batch searches in many scientific bibliographic databases. Within the decentralized SDI service, a real-time search profile formulation feature was developed. By 1985 the results could even be distributed in electronic form, in a common

DOREF format, for use on personal computers. For many database producers this service was the first for which "e-format" royalties had to be discussed and entered in the license contracts. The SDI-service had its peak in 1979/1980 when it was running 23 databases, was used at some 40 different documentation services in Sweden and in the other Nordic countries serving a total of more than 2000 research scientists.

A comprehensive study of the economics of the service (ref.4) was commissioned by DFI when "SDI-online" on the larger commercial information services became a pressing competition. The evaluation resulted in a demand for total cost recovery, a requirement that slowly brought down the offline service.

EPOS-VIRA was in use at IDC-KTHB to provide a part of the SDI-services until February 1997 when the last INSPEC tapes were processed for still some 100 subscribers.

Already in 1973 it was felt that an interactive retrieval system was the natural next step now that EPOS-VIRA had reached a state of development that more than sufficed for the needs at that time.

## Interlude

It is today hard for those there and then to remember and much harder for someone not there and then to comprehend what was happening in a wider context and what the general circumstances were when 3RIP and Paralog were established. Therefore a list of events and developments happening elsewhere during this period is provided at the end of this article.

## 3RIP

The name 3RIP (which properly should be pronounced thrip) has to my knowledge never been explained before. One reason might be that when we settled upon it, we all agreed never to reveal why it was chosen. It is therefore with some apprehension that I now provide explanations. The name was invented in the room facing Valhallavägen in the basement of the library, which originally had been the living room of an apartment for the janitor. In that room was a large table piled with papers and a large green chalkboard filled with writings.

The first explanation for 3RIP is based on 3R + IP - the Three Rs: readin', 'ritin', and 'rithmetics\* + Information Processing. 3RIP was envisaged as a tool for both input and output and with some simple mathematical abilities. In the first applications for funding there are indeed references to these three capabilities.

The second, more ironical, explanation is, to be sure, based on 3 + RIP. The application for funding would provide a sinecure for the main three participants. Although everyone knew, even then, that the project would be far from a resting place no one could anticipate the much time and effort that would be invested in the years to come.

Part of the appeal of the name 3RIP was probably that it was different - one of the prerequisites, the pronunciation vague, and the number in the beginning would ensure that the name came first in sorted listings.

First 3RIP funding proposal to SINFDOK was in 1972/1973.

## Paralog

When Paralog was constituted as a company in 1976 I participated and acquired 72 shares. I was at that time the acting head of the IDC-KTHB and in the beginning there was no conflict of interest, especially as Paralog did not generate any income for me, according to my income tax statement for that year. Sometime in 1977 such a conflict did arise. I needed as the acting head to buy services from the other shareholders of Paralog and I thus had to relinquish my shares that year. I have never since been an active Paralogist but I have of course mentioned 3RIP and Paralog whenever it was appropriate.

My main interest in 3RIP, as the acting head of IDC-KTHB, was the potential for establishing services, in competition with Dialog and SDC and others. At the first Online Meeting in London in December 1977 we presented a list of required functions for an "ideal" interactive retrieval system (ref.5). It contained many of the features existing in the online systems in use at IDC-KTHB but also some specific new possibilities like left truncation, a "save" function, SDI- online and a common index for several databases. A full-fledged interactive service for searching databases in the field of energy was developed at IDC-KTHB and marketed in the Nordic countries. Especially Finland responded enthusiastically to this trial. But this proved too hard, for many reasons, one of them being the limited market in Sweden or even counting the Nordic countries, another the difficulty of establishing a proper pricing structure for services. Full cost recovery was not feasible but even with some subsidies we were at a disadvantage since we did not know the price elasticity of the services. The results of this feasibility study were reported to DFI by the leader of the project group at IDC-KTHB, Malin Edström (ref.6).

## Interlude

In the summer of 1978 I went for two years to Tanzania to assist in developing information services for Tanzania National Scientific Research Council.

## DFI

When I returned to Sweden after two years I took up a new job as Section Head, Section for Research and Development, at the Delegation for Scientific and Technical Information (Delegationen för vetenskaplig och teknisk informationsförsörjning - DFI), a then newly formed government agency in charge of national policy, research and development for information supply, i.e. libraries, information services etc. I was as Section Head in charge of planning and coordination of research and development in library and information science. My tasks included drafting R&D programs, initiating projects, program control, assessment and evaluation. DFI's program for research and development included user studies, development of systems for information retrieval and for library routines, education and training for R&D. We did manage to support to some extent further development of 3RIP and studies of the feasibility of establishing services based on 3RIP (some inherited from SINFODOK).

## Postlude

In 1983 I left DFI to become the (founding) leader of Liblab - the Library and Information Science Laboratory (LIBLAB) at the Department of Computer and Information Science (IDA) at Linköping University (LiU), in Sweden, and remained there until the end of 1997.

After I left DFI my interests changed, at Liblab we focused first on applications of AI to cataloguing and then on our long term vision, the HYPERCATalogue. I have always, of course, followed the developments of Paralog but had not much interaction except for the time we took an interest in case processing and archival retrieval. At that time our idea was that the archival retrieval problem could be alleviated by ensuring that the document architecture of documents that would become archival was designed with the later retrieval issues in mind.<sup>4</sup>

So, here are some of the scenes I remember:

- meeting Mats G. Lindquist for the first time and finding someone to share a lot with
- the shock when Rolf questioned something I had taken for granted, a training for lateral thinking.
- the room facing Valhallavägen with the big (green) blackboard, and later, the group's working place in an apartment on the KTH-site.
- all the discussions ranging from on-demand publishing (in the early 1970s) to the ideas of having nations based on month of birth.
- the poker evenings at Rolf Larsson's apartment.
- all the deep friendships. Being able to calling someone after twenty (or more) years and immediately feeling the same contact we had during these exciting creative years.

## References

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4. Mariam Ginman. SDI-verksamheten vid IDC-KTHB –en utvärdering. DFI-publikationer 1984:5
5. M.E. Edström and M.A. Wallin. Implementation of a new interactive on-line information retrieval system: 3RIP, in Library services in Transition. G.Carlsson, G.Fröberg and S.Schwarz (eds) Stockholm 1977.
6. M. Edström. Implementering av databaser på 3RIP. Projekt vid IDC-KTHB. TRITA-LIB-4072, Oktober 1981.

From batch processing to on-line (interactive). Various events (picked from a number of sources) to indicate the context of the prehistory and early stages.

1962

J.C.R. Licklider & W. Clark, MIT: On-Line Man Computer Communication (August).

1963

With funding from the U.S. National Institutes of Health, Institute for Scientific Information publishes the first issue of Genetics Citation Index (GCI) and the prototype of Science Citation Index (SCI), relying on computer indexing. While GCI is not continued, SCI is first offered commercially in 1964.

MEDLARS (Medical Literature Analysis and Retrieval System), an off-line batch service, begins operation from the National Library of Medicine.

University of Sheffield Postgraduate School of Librarianship and Information Science is founded and two years later begins extensive research program in computerized retrieval methods for chemical and textual databases.

1964

Meyer Mike Kessler, of Massachusetts Institute of Technology, develops Technical Information Project (TIP), an experimental online searching system.

Douglas Engelbart develops the mouse as an input device. Used shortly thereafter for manipulation of chemical structures in input and searching at the Lister Hill Center of the National Institutes of Health.

1965

CAS offers batch (off-line) access to users of the Chemical Titles file.

Partially funded by National Institutes of Health, Chemical Biological Activities is introduced by CAS. It was published simultaneously in printed form and on computer tape and was the first computer-produced service to include full text, searchable abstracts.

The first communication satellite (Intelstat I).

ARPA sponsors study on "cooperative network of time-sharing computers" TX-2 at MIT Lincoln Lab and AN/FSQ-32 at System Development Corporation (Santa Monica, CA) are directly linked (without packet switches) via a dedicated 1200bps phone line; Digital Equipment Corporation (DEC) computer at ARPA later added to form "The Experimental Network."

1966

Chemical Society Research Unit in Information Dissemination and Retrieval is established at the University of Nottingham under the directorship of Anthony K. Kent. In 1969, it becomes the U.K. Chemical Information Service.

Annual Review of Information Science and Technology (ARIST) initiated with Carlos A. Cuadra as editor.

1967

Andreas van Dam completes the Hypertext Editing System, a program that allows nonsequential access to the various parts of a document.

IBM releases the 360/91 machine and introducing the concept of pipeline, which improve the performance of a computer by 33 %.

1966-1968

MARC I and MARC II developed at Library of Congress.

1968

Association of Information and Dissemination Centers - ASIDIC is established by various private and public national and international organizations to deal with production, distribution, and use of electronic products and services.

Information Industry Association is founded by Eugene Garfield, Saul Herner and others.

CA Condensates, an alerting service covering the full range of documents abstracted and indexed by CAS, commences. This is the first publicly available computer file to forthcoming issues of CA.

Computer Science Corp. becomes the first software company to be listed on the New York Stock Exchange.

ALGOL 68 appears but proves difficult to implement.

COBOL is officially defined by ANSI.

1969

On an experimental basis, U.S. National Library of Medicine begins offering online access service, known as AIM-TWX (Abridged Index Medicus Accessed by Teletypewriter Exchange Service), to the MEDLARS database. Uses ORBIT software developed by System Development Corporation.

U.S. National Aeronautics and Space Administration (NASA) begins offering online search service RECON (remote console) to NASA facilities. Uses DIALOG software developed by Lockheed Missiles and Space Corporation.

U.S. Department of Defense implements ARPANET (advanced research projects agency network) to demonstrate how communications between computers could promote cooperative research among scientists.

The first Floppy disk was built and was incorporated in IBM's System/370 machines.

1970

European Association of Information Services - EUSIDIC is established to coordinate and advance the interests of operators of computerized data services.

1971

U.S. National Library of Medicine's MEDLINE (Medical Literature Online) becomes operational.

OCLC goes online.

The first microcomputer (Intel 4004).

Ray Tomlinson of BBN invents email program to send messages across a distributed network. The original program was derived from two others: an intra-machine email program (SENDMSG) and an experimental file transfer program (CPYNET).

Computer Space the first modern video game developed by Nolan Bushnell.

1972

Commercial online systems, ORBIT (System Development Corporation) and DIALOG (Lockheed Missiles and Space Corporation), become available in the United States.

Pong video game is a success.

Dennis Ritchie from Bells Labs. produces C, a programming language derived from BCLP. Unix is rewritten in C by Kernel.

1973

Bob Metcalfe's Harvard PhD Thesis outlines idea for Ethernet. The concept was tested on Xerox PARC's Alto computers, and the first Ethernet network called the Alto Aloha System (May)

ARPANet becomes operational.

1975

First ARPANET mailing list, MsgGroup, is created by Steve Walker. Einar Stefferud soon took over as moderator as the list was not automated at first. A science fiction list, SF-lovers, was to become the most popular unofficial list in the early days.

John Vittal develops MSG, the first all-inclusive email program providing replying, forwarding, and filing capabilities.

The first video terminal VT521 from Digital Equipment.

Altair 8800 becomes the first personal computer (microcomputer) on the market. Over 2000 sold by end of the year. It costs \$395 but up to \$2000 worth of peripherals were needed to make it go. Used Intel 8080 microprocessor and 256 bytes memory.

1976

CAS ONLINE becomes operational on a pilot basis.

Shugart announces its 5 1/4" mini floppy disk drive priced at 390 U\$.

1977

Digital introduces VAX-11/780 the first member of the VAX series of computers.

Gary Kildall of Digital Research develops the CP/M operating system.

This year Radio Shack introduced the TSR-80 model 1, the first complete pre-assembled small computer system. It included 4 Kb RAM, 4 Kb ROM (including Microsoft's BASIC), a Keyboard, Display and Cassette interface.

1978

Dan Bricklin and Bob Frankston develop Visi Calc, the first spreadsheet program for microcomputers, which will be distributed on the market in 1979 by Software Ants. Initially available only on Apple II, the program was an instant success.

First version of Oracle that will become the standard database for mainframe and Client/Server networking.

1979

FirstMUD, MUD1, by Richard Bartle and Roy Trubshaw at U of Essex.

On April 12, Kevin MacKenzie emails the MsgGroup a suggestion of adding some emotion back into the dry text medium of email, such as :) for indicating a sentence was tongue-in-cheek. Though flamed by many at the time, emoticons became widely used.



Wayne Ratliff develops the Vulcan database program that will later become dBASE II. It allows up to 65,000 records, and up to 32 fields of 1Kb each.

Ada language developed by US Department of Defence.

Hayes Microcomputers Products announces the Micromodem 100 the first commercial modem. It could transmit at 110 to 300 bps.

Xerox, DEC and Intel announced the Ethernet.

Usenet, a multidisciplinary computer network of news and discussion groups, is formed. CompuServe and The Source on-line services open.

1980

The ACS publication, Journal of Medicinal Chemistry, is made available in full text on an experimental basis on the BRS (Bibliographic Retrieval Service) online system.

IBM introduced its personal computer (PC) for use in the home, office and schools.

Shugart released 51/4" Winchester driver that holds 80 times as much data as a standard floppy and transfer data 20 times faster.

Commodore VIC-20 becomes the first million-seller model in the history of computer industry. It has 5 Kb RAM, BASIC in ROM, Colour Display, Modem interface, etc. for 300 U\$.

1982

EUnet (European UNIX Network) is created by EUUG to provide email and USENET services, original connections between the Netherlands, Denmark, Sweden, and UK.

1984

Apple's Macintosh line is being introduced.

...and 1990

Quoted from the CERN home page

"By the end of 1990, Berners-Lee had defined the concepts of http, HTML and the URL - the fundamental concepts of the Web - and a prototype graphic web browser, server and web page editor were up and running.

European physics institutes put up the first web servers in 1991, and on 12 December of that year, the Web crossed the Atlantic when the Stanford Linear Accelerator Center, which has close links with CERN, put the USA's first web server into service."

## Endnotes

1

2 Ed's note: the acronym RIT for Royal Institute of Technology was used at the time as witnessed in the name of the report series of the different schools at KTH: among other TRITA-Lib- for technical reports and other publications by the Library.

3 Ed's note: in Sweden also called "literature engineer" in enterprises. When the use of computers became part of the job the denomination "informatiker" was introduced. The same, in fact, that had already been in use in Finland describing professional engineers who had taken a degree in information analysis.

4 Ed's note: A thought very present in the later work on scientific e-archives, see for example the proposed e-archiving model OAIS as discussed by G.M.Hodge in Digital Preservation: An overview of current developments pp 73-82 in B. Mahon and E.Siegel (ed) Digital Preservation. IOS Press, 2002.