ICT for people

40 YEARS OF ACADEMIC DEVELOPMENT IN STOCKHOLM

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THE A-COMPUTER SYSTEM CONFLICT

by Tomas Ohlin

In the 1960s and beginning of the 1970s, the concept "Information society" was often considered to represent something futuristic. Public discussion was limited. Instead, the most natural ICT-related general discussions concerned computer systems, their type of use, and their industrial backgrounds. The IBM practical monopoly and its consequences were discussed. Should small countries like Sweden allocate development resources to inhouse manufacturing of computers, or rely on internationally available industrial sources? Possible industrial dependencies were discussed.

In the early years, the public sector was slow in applying computerized systems. Sequential file systems were developed, but databases and distributed access was tried only to a limited extent. Legally, ICT relations concentrated on personal integrity problems. This was a legal area where Sweden – with its integrity legislation of 1963 – was a pioneer, especially owing to the work by Parliament member Kerstin Anér, documented in the book "Datamakt" (Data Power).

With this background, the few computer affairs that reached the press were uncommon and somewhat exotic. One of them, which turned out to grow to an affair of some magnitude, was the change of central computer systems within the Stockholm University area. The organization of university computing in the 1960-70s was centralized. Direct government influence was substantial, resources for acquisition of university computer equipment were controlled very severely. In the center of the decision making was Statskontoret, a central public rationalization authority. There were close links between this authority and the Ministry of Finance.

Statskontoret went as far as to defining an own currency for guiding and controlling the different university computing centers around the university areas. Statskontoret formally bought the central computers, placed them at certain computer centers, and handed out virtual "usage coins" according to a home created policy. To receive such coins for a university institution, you had to gear your computer usage pattern according to a model that appealed to Statskontoret. The result was an extremely centralized system of computer use.

Since there was no organizational competition, the students and researchers felt chained.

The advisory group, that Statskontoret used, was Stockholms Databehandlingsdelegation, an expert body of administrators, politicians and researchers. The majority here was compact, and opposition was unusual. Administrators and politicians were in majority, and researchers were in minority.

Central computer systems in this case were classified according to size. Small machines, with market price (at the time) of around 10 000 Euro, were named C-machines. Medium sized machines for up to 100 000 Euro were B-machines, and the very few A-machines were quite expensive.

Around 1965, Stockholm University needed a new family of computers. A demand analysis was defined which stressed the outer environment and manufacturer concerns. This demand analysis for the A-machine project was centrally carried out in a way that seemed biased, and that would likely benefit IBM, who was the market leader at the time. IBM´s market influence was of a magnitude that was unprecedented. (It could only be compared with that of Microsoft today).

The main public Statistical Authority (SCB) also needed new equipment, and it was decided that a new IBM 360 model 50 should be installed there. This series of new machines was at the time quite unproven, and the main software was untested in several respects. However, SCB, that had been using IBM for some time, chose to continue to follow the IBM line, a choice that turned out to lead to waiting time for tested software. But in this case certain delays in this case were accepted.

For the university area, the choice of manufacturer would mean an enlarged influence for this manufacturer, through all student and research users. Therefore, several vendors made

priority for this project. Central administrators with purchasing influence were courted more or less openly.

The A-machine project contained several machines, a big system in the middle and a number of smaller machines in the periphery. And perhaps even more important, its "cultural" user influence would spread, and have substantial indirect market effects in wide areas.

The first A-machine requirements analysis outline, defined by Statskontoret, reached the Stockholm University department for Information Processing in 1967. Some teachers and researchers there were astonished by the uniformity and passive content of the analysis outline. In beforehand, it gave the impression that the project already was decided. IBM would be the winner. Although it was a fact that the full 360 series at the time was unfinished at the manufacturer, and that main software not yet existed, IBM vendors succeeded in convincing the main authority Statskontoret, that these products would be delivered in time.
To university people, this seemed like a completed run already from the beginning.

At that time, in late 1967, two teacher/researchers at the University department decided to show their interest. Janis Bubenko and Tomas Ohlin, with the support of Börje Langefors, managed to place themselves as university representatives in the Advisory expert commission that would suggest to Statskontoret which computer system to choose. In spring 1968, when system decision time approached, IBM was in the lead concerning the type of evaluation efforts that Statskontoret had defined. However, for a number of experts, it turned out that system evaluation and comparing efforts were unsatisfactory.

Bubenko and Ohlin then decided to define a more thorough evaluating effort by themselves. A number of measurements were carried out, based on certain families of different "test jobs". Theoretical comparisons and practical measurements were made about the efficiency of different machines for these test jobs, systems from Control Data, General Electric, IBM, ICT and Univac.

The result from these measurements showed firstly that small to medium-sized machines would be recommendable for "smaller" jobs, and secondly that for the very A-machine, IBM placed itself quite low in processing efficiency. This was the case especially for "heavier" jobs. The efficiency difference was as large as close to a factor 2.

Part of the discrepancy relied on main software differences. Univac and GE had developed existing operating systems that could handle multiprogramming dynamically, something that IBM at the time could not. IBM could only deliver "Multiprogramming with a fixed number of tasks", MFT, and not "Multiprogramming with a variable number of tasks", MVT. Also, there were heavy differences concerning usage concerns, especially job control and network capacities.

Bubenko´s and Ohlin´s report was naturally criticized by those who felt that IBM ought to be the winner. The report was said to have measured less important system matters.

Although the Stockholm University and the Royal Institute of Technology formally backed up Bubenko and Ohlin, the final system decision by Statskontoret was not supportive to their evaluation work. The autumn 1968 decision to choose IBM 360/75, with 360/30 as additional support machines, gave the impression to be a "political" one. IBM representatives were very competent in convincing the Ministry politicians that their system was what Swedish universities needed.

During the year when this "computer battle" took place, newspapers covered the affair quite closely. At times, even a weekly comment was given in the Dagens Nyheter. What was the latest news? Would the researchers win? Therefore, the defeat of the researchers and student users, who had preferred another manufacturer, was given thick newspaper headlines. "Bureaucracy wins over university research!" Newspapers were emotional.

This was one of the few moments where computer system concerns reached the newspaper headlines in the late 1960s.

Afterwards, it turned out that there were

heavy delivery delays regarding main IBM systems software, and that systems efficiency turned out to be quite close to Bubenko`s and Ohlin`s measurements. In that respect, although users for some time had to suffer because of low system efficiency, theoretically the two university researchers were successful.

The lessons from the A-machine affair turned out to be a motive for Bubenko and Ohlin to summarize a number of the theoretical findings and experiences in two 1971 books. "Introduction to Operating Systems" (unfortunately only in Swedish language). These books were used in university education in Sweden for many years during the 1970- and 80s. They were probably among the first university texts in the world that analyzed operating system qualities theoretically.

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Design: Hardy Hedman
in cooperation with bjornekulldesign.se

Cover photo: Kjell Johansson/Bildhuset – Scanpix

ICT for People
Department for Computer and Systems Sciences (DSV)
at Stockholm University and Royal Institute of Technology,

www.dsv.su.se

ISBN 13: 978-91-631-9588-4
ISBN 10: 91-631-9588-7