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NATIONAL INSTITUTE FOR RESEARCH IN NUCLEAR SCIENCE

GOVERNING BOARD

Further Details and Proposals Concerning an "ATLAS" Computer

by T. G. Pickavance

Brief details of a proposal to site an Atlas computer at the Rutherford Laboratory were given in paper NI/60/14. The following further notes may help in the discussion on January 30th.

1. The Minister for Science's Working Party took into consideration the following points:-

    (a) The AEA have placed a three-year contract for the hire of a "Stretch" from 1962, but its continued operation beyond 1965 and particularly for more than one shift will be more expensive than the purchase of an "Atlas". The performance of "Stretch" has declined somewhat on original expectations. While it cannot be certain that "Atlas" will itself come up to present expectation, it is considered that the importance of ensuring that a large British computer is produced, taken together with the potential estimated demand, provides a strong case for placing an order now, subject to suitable conditions about performance and negotiations of a reasonable price. An order placed now in the U.K. with official backing would also encourage Ferranti's in their attempts to secure further orders in this country and abroad (e.g. from CERN or from American sources which are known to be interested.) Components for computers of greater capacity than "Stretch" or "Atlas" are now under development, but it is virtually certain that these will not be commercially available before 1970.

    (b) The Atlas is being developed with the assistance of research workers at Manchester University. It is likely that if an order is placed for it, the first machine will be available in 1963 or 1964. It will be approximately 10 times faster than the largest computers now in use or shortly coming into service such as the Ferranti "Orion". The "Atlas" is estimated to cost £1$\frac{1}{2}$M to £2M according to the size of the memory store. The memory will in any case be very much larger than that of existing machines. The "Atlas" is therefore capable of undertaking computation which is either impossible or would take very many hours on smaller machines.

    (c) In the estimate of requirement for time on an "Atlas" quoted in NI/60/14 the AEA's separate requirement for defence purpose was not included. Separate arrangements, including the hire of the "Stretch" machine mentioned above have been made to meet it. It has been considered whether, for the time being at least, the university requirement could be met by making this "Stretch" available on a night shift. For reasons of security, inconvenience, the probable continuation of an American monopoly in computers of this calibre, and the lack of a reserve against expanding needs it has been concluded that this solution is not to be recommended.

2.   The Working Party recognised the possibility of a rapid increase in the requirement for "Atlas" time, which might enable one or more universities later on to make a case for the provision of the "Atlas" situated in the university.   They recommended that a further review of needs should be made towards the end of 1962, in order to see whether a case for the provision of more than one Atlas machine in 1964 then exists.

3.   The Working Party assumed that the English Electric KDF 9 would be made available to certain universities.

4.   The point was considered important that Ferranti's would be greatly helped in convincing potential customers for Atlas if they had first secured an order from a large organisation in the U.K., particularly the U.K.A.E.A. who were large operators of computers and had already committed themselves to IBM machines from 704 to Stretch.

5.   The Working Party have now recommended that the AEA should be authorised to place an order for an "Atlas" machine with the largest size of memory store for delivery in 1963 or 1964, and that if the Institute agree, it should be installed at Harwell under the control and management of the NIRNS, subject to making an agreed minimum time available to the AEA.   Having established their case to use the computer, universities could be guaranteed an agreed minimum of time under their own management.

        The Treasury have asked the NIRNS to decide whether or not they are willing to take over the management of an "Atlas" as proposed.   At the same time they have asked the Minister for Science's office to obtain an opinion as to whether there is any legal objection under the terms of the Royal Charter because a substantial part of the use is not for nuclear science.   (A provisional legal opinion has been given that there is no objection).   Thirdly, the Treasury have agreed that the AEA should begin tentative contractual discussions with Ferranti's.

6.   The Institute and its committees are primarily organised to provide and operate accelerators (and large research reactors when required).   Although nuclear science provides a substantial element of the requirement for the "Atlas", the known requirements from other fields are at present greater.   Special arrangements for the "Atlas" would therefore be needed.

        I suggest that a Computer Committee would need to be formed to advise the Board on all matters concerning the Institute's interest in the computer.   It would include several Board members together with computer specialists and users of such standing that the Board and the university users could be expected to find their recommendations accep-table.   I suggest that the man responsible for discharging the Institute's function on the computer should report directly to the Computer Committee.   I believe that both AEA and NIRNS staff would have to be involved in operating the computer; details of the collabora-tion between the Authority and the Institute in this matter would need to be worked out.