Each succeeding generation of computers has incorporated improvements in the size of memory, the speed of computation, and the density of data storage such that the capacity and speed of operation have been increased many times over. By now the technological revolution has become so significant that a reexamination of the situation is urgently needed.

From the outset, the computer, like other forms of automation, reduced the amount of labor required in the processing of data. This fact in itself is not remarkable, but it is the magnitude of this reduction that is revolutionary. Data processing which would have required hundreds of thousands of man-hours to carry out 15 years ago can now be carried out with much greater efficiency in a matter of a few minutes. Data processing tasks which would never even have been considered because of the magnitude of the cost involved now can be done cheaply and easily. Equally important is the fact that the timelag between the input of information and the final output has been substantially reduced. Operations which took 8 months to a year to complete with a small army of clerks can now be reduced to a matter of days or weeks with relatively few people. This shortening of time has not only meant an increase in efficiency in terms of overhead and other fixed elements, but it has also resulted in making important information available more promptly.

The computer has also made possible new kinds of analysis. Editing instructions to test the reasonableness of the basic information can be built into the processing programs. It has become possible to examine and edit data much more carefully. Computers can "wash" the information, and find inconsistencies which would have gone unnoticed in hand editing. For some Federal agencies the ability of the computer to make consistency tests is very important. Thus, the Internal Revenue Service currently uses computers to check the internal consistency of items contained in each individual tax form. Such an operation is basic to the major administrative function of this agency, but before the introduction of the computer it was too expensive and time consuming to be feasible except for a very small number of cases. In such uses the computer is adding a new dimension to the work and increasing the overall efficiency of the agency.

The problem of data storage and access has also been greatly simplified. Before the development of the computer the storage of original data was difficult. The Internal Revenue Service had warehouses full of bales of tax forms tied in packages. The Census Bureau had every available corridor lined with cases of punchcards, and many punchcards had to be destroyed merely because there was no physical room to keep them. Computer tapes have radically changed this situation by dramatically reducing the storage space required. This reduction in required storage space has at the same time resulted in greater accessibility of the data. As long as data were in bales or even in punchcard form, the cost of access was so great that for most purposes it was not feasible to use the data. Now, however, it costs relatively little to put a tape on the computer and to use it as desired.

The existence of large sets of relatively accessible data on computer tape makes matching operations more feasible. The usefulness of matching operations has always been apparent, but the prohibitive cost made them impractical. This last March the Census Bureau started publishing in its "Data Access Descriptions" a report (MS–1) on