COMPUTER SYSTEM FOR RECORD

KEEPING AND UPDATING

A THESIS

submitted for partial fulfillment of

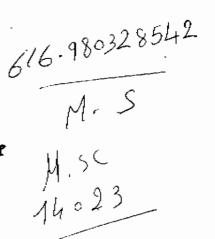the degree of M.Sc. in industrial

medicine and occupational health

by

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M. Salah Ibraheem

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INTRODUCTION AND REVIEW
OF LITERATURE

(4) Minimise cost and inefficiency. (Halley and Wolkonsky, 1978).

Reports written from memory, though they may be sufficiently accurate in certain instances for control purposes, are almost inadequate as a legal record. (Halley and Wolkonsky, 1978).

The importance of the"Medical record" keeping is undeniable, also the problems of their accuracy and completeness are well known; It is possible that the main reason for the inaccuracy in most of the record system is the limited number of personnel who are untrained and are asked to cope with lots of paper work. This inaccuracy results in the inability to draw good and reliable statistical data, which may lead to the loss of interest and enthusiasm to complete the records as it seems pointless. This in turn will add, to the inaccurcy, and a viscious circle develops. The record keeping is one of the most known and common fields in which computer employed. In Egypt this is not widely used.

The department of Occupational Medicine, Faculty of Medicine, Ain Shams University had conducted a large survey in 1977-78 in Upper Egypt and Red Sea areas as a part

of periodic medical examination of industrial workers in these areas. Results of this survey were inadequtly kept in the traditional manners. Members of the department suffers difficulties in retrieving information from these data when needed. It was found interesting and useful to test the ability of a computer system to keep these data.

2- History of recording techniques:

The history of data processing reflects the search for more efficient ways of gathering, recording and handling data in order to keep pace with the increasing volume and complexity of governmental and commercial activity. The techniques that appeared in response to changing needs throughout the centuries were often a clearer indication of the facilities that were available than of the true need. Thus, the history of data processing also, reflects the technological progress of civilization. (Arnold et al., 1978).

The oldest surviving written records are in the form of pictographic writing on clay tablets made by the ancient Sumerians, the predecessors of the Babylonians during the period 3700 to 3000 B.C. It played an important role

in the commercial and governmental affairs of the Babyl-
ionian Empire.   The clay tablets are difficult to handle
therefore, the need for a more practical recording medium
became apparent.   The need was met in Egypt by the use
of papyrus and the calmus. The stems of papyrus plant
were used to make the writing material, also called pa-
pyrus which was the predecessor of paper. Government
book keeping grew to enormous proportions under the ph-
araohs.

Although Greeks and Romans in the ancient times
had used papyrus, they depended also on the tablet book
consisting of 2 to 10 sheets of book coated with wax
tied together with thongs.   Records were scratched on
the waxed surfaces with a pointed bone or metal stylus,
by obliterating the writing, the tablets could be used
again and again.   After the tablet book used by Greeks
and Romans, there were many developments in recording
techniques as the use of wooden tallies in England after
the invasion of William the conqueror in 1066 but, the
developments in commercial accounting that led to our
modern methods, were an outgrowth of Italian commerce
during the thirteenth century.   The earliest known
system of complete double - entry book keeping is one
that originated in Genoa in 1340.

The next step in development was the introduction of paper to Europe. Although, paper can be traced back to the second century B.C. in China, it did not become available to the rest of the world until the eighth century A.D., when it was discovered by the Arabs. The first large - scale manefacture of paper in Italy occured in 1276. By the second half the fourteenth century, the use of paper had becqme well established in all of Western Europe. Another development was the widespread use of graphite lead pencils by the beginning of the sixteenth century. As the twentieth century approached, there was a most significant occurrance in the history of recording techniques, the development of the typewriter.(Arnold et al., 1978).

II. EVOLUTION OF COMPUTING DEVICES

Throughout history, people have experienced an ever-increasing need for numerical calculations and have co-ntinually sought ways to meet this need with a minimum of mental and manual effort. Since, the invension of the abacus in China about 2600 B.C. there were many dev-elopments in computing devices, such as the gear - driven machine which is a digital counter invented by Pascal in 1642. The cash register invented by Dayton, in 1879 used for computing, recording and controlling purposes. The adding - printing machine invented by Burroughs in 1884. The machine had the ability to rcord and summerize as well as to calculate.

Electro - mechanical machines came into general use about 1920. Electric activation provided greater speed and facility in the use of adding, calculating and book-keeping machines. The final step of evolution was the development of electronic computers (Arnold et al., 1978).

Development of electronic computers:

The first machine to use electronic tubes for calu-lating was the ENIAC (Electronic Numerical Integrator

and Computer) developed between 1942 and 1946 at the
university of Pensylvania by Dr. Mauchly, Eckert and
their associates.   ENIAC occupied the entire basement
of the university's Moore School of Electrical Engineering.
The computer weighed almost 30 tons, contained more than
18,000 vacuum tubes, and required more than 1,500 square
feet of floor space.   It was designed mainly for solving
problems in ballistics at the Aberdeen Proving Ground,
but it contained advancements that were adopted for use
in other computers designed for business applications.
In this machine the switching and control functions,
once performed by relays, were handeld by vacuum tubes.
Thus, the relatively slow movements of switches in elect-
romechanical computers were replaced by the rapid motion
of electrons.   This innovation made it possible to per-
form computations one thousand times as fast as before.
However, its limited storage facilitis and the difficu-
lty of presenting instructions were serious restricitons.
To incrrease the computer's capacity to work problems wi-
thout the assistance of an operator, it was necessary to
 have its program stored in a high speed internal stor-
age nemory.   This would give the computer access to in-
structions as rapidly as they were needed.   With an
internal storage system, the computer could process a

program in a manner similar to that in which it processed data. It could also modify its own instructions as required by progressive stages of work. These characteristics were incorporated in the stored program digital computers that marked the next great milestone in the development of electronic computers. Next, the EDSAC, (Electronic Delayed Storage Automatic Computer) which came from Cambridge University of England and was placed in operation in May 1949. This machine utilized mercury acoustic delay lines as storage. The EDVAC (Electronic Discrete Variable Automatic Computer) which was comparable to EDSAC, was completed in the early 1950'S at the University of Pensylvania for the United States Army. It also used the sonic delay properties of mercury for storage. Another project for a high - speed electronic computer using delay line storage was completed in London in 1950 called ACE (Automatic Calculating Engine). It used standard punched card equipment for input and output. Another computer belonging to this group was the UNIVAC (Universal Automatic Computer) developed by the builders of ENIAC in 1951. It was one of the first machines to use magnetic tape as an input - output medium. It featured speed, reliability, memory capacity, and the ability to handle both numbers and