Evaluation and Re-Designing Of a File Retrieving System in A Village Medical Center

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---**ABSTRACT**---

The need for ease of files retrieval by the hospital record office is the epicenter for this study. It was discovered that the current file retrieval system was not conducive for effective office productivity. Hence the need to redesign a file that is both convenient, in term of retrieval and at the same time saves time. This will help to control how patient's data are stored and retrieved.This work evaluated the filing system of a village medical center. For this purpose, the work-study approach was employed to evaluate the file retrieval system in the office. The productivity index for the old system of filing was obtained at 0.290 and the new filing system was calculated as 0.528, which shows a 49.3% increment when compared to the old filing system.After a careful evaluation of the new filing system, we concluded that the ease of retrieving the newly developed files is more preferable in terms of time reduction and accessibility. The time obtained in retrieving old files from the cabinet is much when compared to that of the newly developed files. Therefore the workers were adjudged to be more productive when searching and retrieving files from the cabinet when using this new system of filing.

KEYWORDS : *File retrieval system, productivity index, standard time, time study, work-study.*

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I.   INTRODUCTION

Though there is gradual move towards a paperless office due to the increasing use of internet and ICT platforms. However paper documents and files based-information management culture still dominates many local hospitals especially in the developing countries. There is a flurry of medical data about the patients coming to the hospital for consultation. It is now pertinent to be able to lay hands on the information we need at the right moment. Most times, the hospital record office wastes own time and often the time of their patients searching for files in the office cabinet. This adds to the stress experience during consultation with the medical personnel and makes the task of putting the data to use more difficult and prolonged than it ought to be. Hence, to get our work done in a timely manner, there is a need to get more organized and efficient with our file management system. This prompted the redesign of a new file that is more effective and productive in terms of time and ease of retrieval. A higher productivity therefore entails doing the work within a shortest possible time with least inputs expenditure while not sacrificing quality with minimal wastage of resources (Dorgan, 1994). Extensive research concerning the effect of an unfavourable workplace environment on employee productivity has been undertaken worldwide. Majority of the research found that there were several elements known to contribute both positively and negatively to productivity. Some researchers discovered that these elements affected both the psychological and physiological welfare of the workers causing such conditions as eyestrain, fatigue, headache,

back pain and nausea (Quible, 1996). It is important to solve these problems, otherwise it will place the organization in a bad situation as many people in the office may become sick and there may be delay in completion time. An administrative office manager should therefore be able to organize the workplace based on an ergonomically sound office environment (Berverly, 1994).Record creation results directly from daily transaction of businesses or activities. In most cases the way in which people and organizations do business results naturally in the creation of records; in other words, records must be deliberately created before

conducting any form of transaction or activity. Records that will meet accountability requirements and other needs of an organization cannot be created or managed without an adequate filing system. Filing management practices, and in particular records creation, must be systematized through policies, procedures and the application of best practice (Keeling, 1996). Appropriate controls should be built into filing systems to capture and identify accurately information required by an organization or individual. All these can be achieved by creating an effective filing system that will ease the stress and save the time of the user.

1.1 FILE AND FILING SYSTEM

Records are held in files to enhance accessibility and identification; files therefore are created and included in a filing system to provide formal evidence of record keeping of an organization. Their purpose is to capture and maintain records over time in accordance with accountability and standard practice. The establishment of a coherent filing system provides for faster and systematic filing, faster retrieval of information, greater protection of information, and increased administrative stability, continuity and efficiency (Carnevale,1992).The systematic arrangement of files in which files are named and placed logically for storage and retrieval is referred to as filing system. It is a system of classifying in which files are arranged either alphabetically or numerically. It is used to control how information are stored and retrieved. Without a filing system, information placed in a storage area would be one large body of data with no way to tell where one piece of information stops and the next begins. However, by separating the data into individual pieces and giving each piece a name, the information is easily separated and identified.

1.1.1 FILE TAGGING AND COLOUR CODING

A file tag is a piece of strong paper attached to a file at one end as a label or indicator bearing the details of the file. It aids finding and replacing files easily by the users whereas the colour coding uses an array of colours to distinguish files from one another. It makes record easy and fast to find and eliminate misfiling and record duplication. It is a natural development to accompany shelf filing because the ends of the folders are readily visible and therefore results in the formation of a colour block pattern. When these patterns of colour are broken, it is easy to see that a misfile has occurred. Colour coding of files almost eliminates hidden misfiles, confirms accuracy in filing, offers fast filing and retrieval, works with any filing sequence, allows rapid presorting by colour recognition, guides users to within an inch or two of records being sought before even touching cabinets or records, and substantially speeds important file management functions(Keeling,1996).

1.1.2 FILE ARRANGEMENT

There are three commonly utilized types of filing arrangements which are designed to file and reference records in different ways. These are; alphabetical, numeric, and alpha-numeric filing arrangements. Each has advantages for certain types of records and reference needs and each possesses distinct patterns of arrangement and indexing. Once the proper arrangement has been selected, it is suggested that file procedures manual be established. The file manual is used by everyone working with the files and it maintains the integrity of the filing system.

III RESEARCH METHODS

The productivity of an office filling system can be consistently increased through the application of work study and this is the main focus of this project. Work study is a collection of techniques used to examine work, what is done and how it is done, so that there is a systematic analysis of all the elements, factors, resources and relationships affecting the efficiency and effectiveness of the work been studied. The component of work study shown in Fig.3.
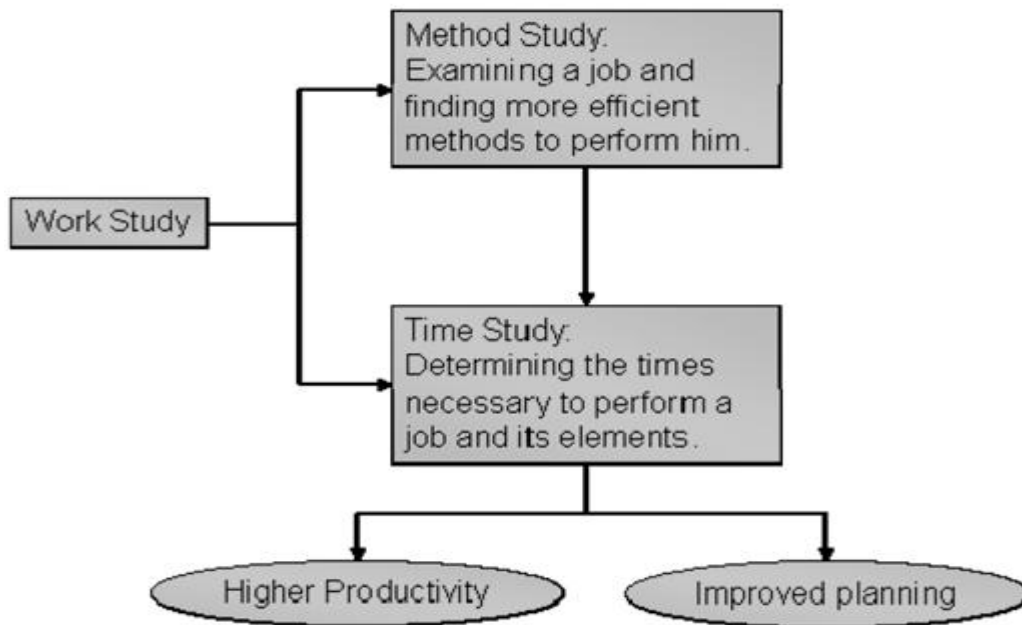
.
Figure 3:Component of Work Study

3.1 TIME STUDY: A TOOL FOR PRODUCTIVITY

Time study is defined as the assessment of the time a job should take to be done. It can also be defined as a term covering the collection of methods used to establish the time required by a qualified worker to carry out a specific job at a defined level.

Fundamental approach of time study which consists of the following seven steps were used to estimate the time taken to complete the task for the current method:

[1] Information about the present filing system were obtained and recorded
[2] Each activity was broken down into elements
[3] Each element was examined so as to know whether it is appropriately used in doing work.
[4] The time that was required to complete the task by a qualified worker were observed and recorded with the aid of a stopwatch.
[5] The basic time for each activity were gotten through the following formula

a. *Basic time =*

$$\frac{Observed\ time\ x\ Performance\ rating}{100}$$

[6] vi. Relaxation Allowance + Contingency time was assumed to be 9% of basic time
[7] The standard time for each operation were computed as:
  Standard time = Basic time + Relaxation time allowance + Contingency time

To measure available work in terms of time units, three types of time measures have to be known: observed time, basic time and standard time. The normal time is the time a qualified worker spent on retrieving files, while basic time is the product of normalized speed and the observed time. The standard time was the basic time the qualified worker takes to complete the file retrieving plus the associated relaxation time. For the purpose of this study, time study was carried out for a period of 14 days to be able to determine the time taken in retrieving a single file from a stack of files for both the old and newly develop system of filing.

Observed time x $\frac{Observed\ performance\ rating}{Normal\ rating}$ *……………………………………………………1*

Standard time =Basic time + (Relaxation time allowance + Contingency time allowance)……….2

Relaxation allowance may be determined scientifically when observed time and performance rating are being recorded, depending on the nature of the work. Other factors which contribute to time allowance include posture at work, type of motion of the body, eye or visual strain and thermal conditions. There is also the contingency time allowance due to unanticipated official disturbance to one at work. The value can be determined as a matter of policy in an establishment.. It requires long periods of observations of task being

performed. The total resting time the worker used during this period of work may be expressed as a proportion of the total observation period (Owaba, 2002).

3.2 MODEL ASSUMPTIONS AND NOTATIONS

The assumptions for this work are:

[1] Relaxation allowance + contingency time = 9% of basic time

[2] Relaxation allowance has different values for both male and female workers (Currie,1959)

[3] Performance rating of female worker is assumed to be 95% and that of male worker is 115%

[4] Normal Rating = 100%

$$\textit{Average standard Man-Hour} = \frac{\sum_{i-1}^{n-14} S}{N} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots 4$$

5) Qualified workers were used to carry out the study

$$\textit{Single Factor Productivity} = \frac{Total\ number\ of\ files}{Standard\ man-hour} = \frac{M}{\sum_{i-1}^{n-14} S} \dots \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots 5$$

Model Notations

ta =Average time to retrieve a single file   N=Total number of days of observation
n=Number of files treated per day   S=Standard Time
te =Total time to retrieve files per day   Pr=Productivity index
M=Total number of files observed

3.3 DESIGN AND ANALYSIS TOOLS

Two Computer aided design tools, Solid Works and AutoCAD were used to design possible files. The AutoCAD is a software application for engineering designs from Autodesk while Solid works is 3D computer-aided design software.
Others tools: Stop watch for time study, meter rule for linear measurement.

3.4 DESIGN SPECIFICATIONS OF FILES DIMENSION

Two cases or file items were considered for designs. The ideas revolve around the following

[1] **Modifying existing files to become ergonomically more friendly**: Since it is obvious costly and delicate to discard all existing files in the archives and replace with new ones, we therefore adopt the idea of converting the old ones to ergonomically one. This conversion will be by use of appropriately designed tag system.

[2] **New Files**. We are proposing that new files and other record file system should adopt proposed new design.

The dimensions for the files are as follows:

Table 3.0: Design Specifications

	Length	Width
TAGS	55mm(5.5cm)	40mm(4cm)
WHOLE FILE	360mm (36cm)	260mm(26cm)

3.1.2 Design Using Solid Works

Solid works is a 3D mechanical CAD (computer-aided design) software. Fig.3.0 and 3.1 below shows the file design using solid works
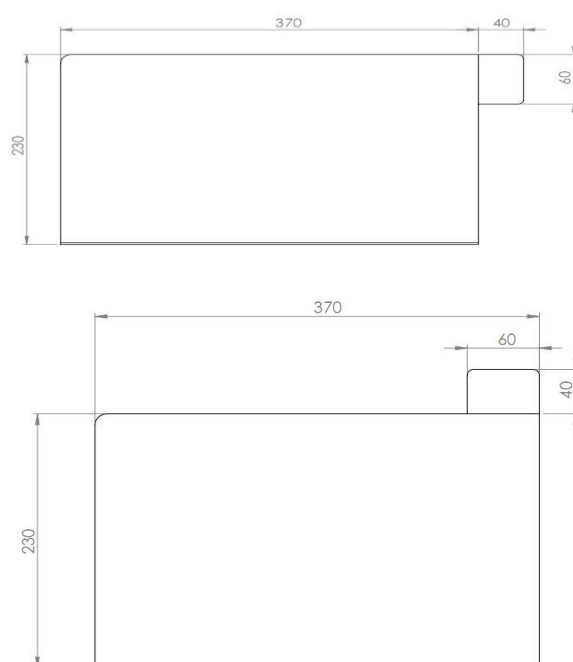
Figure 3.1: Old File Model Using Solid works

Figure 3.2: New File Model with Separate Tags

Figure 3.4: Newly Redesigned File Model Using Solid Work

Fig 3.5: Dimensions of Redesigned File Using AutoCAD

IV ANALYSIS AND RESULTS

A stack of 499 files were observed during this period, and the time taken to retrieve each file recorded for both the old and the newly re-designed files. This was done with the aid of a stop watch. The newly developed files was arranged accordingly in a designated cabinets and tags placed on each of the files, for ease of identification and retrieval. The time taken in retrieving each of the 499 files were noted and recorded. The estimated time were later used to calculate the productivity index which is a function of the performance measure of the two files. The results were obtained using Microsoft Excel®, as shown in Table 4.0 and 4.1

Table 4.0: Results for Old Filing System

Number of Files Retrieved per day (n)	te(Min)	P.Rating (%)	Basic Time	Relax+Contig	Standard Time(Mins)	Productivity Index(P_r)
65	195	1.15	224.25	20.1825	244.4325	0.266
42	126	1.15	144.9	13.041	157.941	0.266
23	69	1.15	79.35	7.1415	86.4915	0.266
35	105	1.15	120.75	10.8675	131.6175	0.266
55	165	1.15	189.75	17.0775	206.8275	0.266
45	135	1.15	155.25	13.9725	169.2225	0.266
35	105	0.95	99.75	8.9775	108.7275	0.322
31	93	0.95	88.35	7.9515	96.3015	0.322
19	57	1.15	65.55	5.8995	71.4495	0.266
50	150	1.15	172.5	15.525	188.025	0.266
25	75	0.95	71.25	6.4125	77.6625	0.322
35	105	0.95	99.75	8.9775	108.7275	0.322
29	87	0.95	82.65	7.4385	90.0885	0.322
10	30	0.95	28.5	2.565	31.065	0.322

Note: The average time (ta) spent in retrieving a single old file =3.0mins
Total time spent on retrieving files=1497 Mins (24hrs 95 mins)
Total Standard Time =1768.58Mins (29hrs 48mins)
Average Standard time=126.3271 mins(2hrs 11mins)
Total Number of Observed Files = 499

Overall Productivity Index = 0.290

Table 4.1: Results for New Filing System

Number of Files Retrieved per day (n)	te(Min)	P.Rating (%)	Basic Time	Relax+Contig	Standard Time(Mins)	Productivity Index(P_r)
65	97.5	1.15	112.125	10.09125	122.2163	0.532
42	63	1.15	72.45	6.5205	78.9705	0.532
23	34.5	1.15	39.675	3.57075	43.24575	0.532
35	52.5	1.15	60.375	5.43375	65.80875	0.532
55	82.5	1.15	94.875	8.53875	103.4138	0.532
45	67.5	1.15	77.625	6.98625	84.61125	0.532
35	52.5	0.95	49.875	4.48875	54.36375	0.644
31	46.5	0.95	44.175	3.97575	48.15075	0.644
19	28.5	1.15	32.775	2.94975	35.72475	0.532
50	75	1.15	86.25	7.7625	94.0125	0.532
25	37.5	0.95	35.625	3.20625	38.83125	0.532
35	52.5	0.95	49.875	4.48875	54.36375	0.644
29	43.5	0.95	41.325	3.71925	45.04425	0.644
10	15	0.95	14.25	1.2825	15.5325	0.644

Note: The average time spent in retrieving a single New file =1.50mins
Total time spent on retrieving files=748.5Mins (12hrs 48 mins)
Total Standard Time =884.2898 (15hrs 13mins)
Average Standard time=63.164mins (1hr 1mins)
Total Number of Observed Files = 499
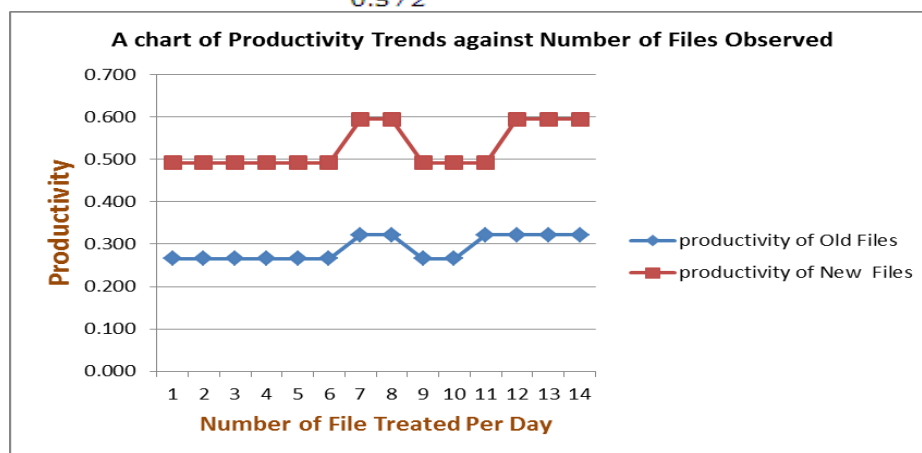*Overall Productivity Index = 0.572*

The percentage increase in productivity was calculated as:

$$\frac{Productivity\ of\ new\ files - Productivity\ of\ old\ files}{Productivity\ of\ new\ files} \times 100$$

$$\frac{0.572 - 0.2900.572}{0.572} \times 100 = 49.3\%$$

Fig 4.0: A Chart of Productivity Trends Against Number of Files

4.1 DISCUSSION OF RESULTS

From table 4.0 the estimated time was obtained over the performance rating of the qualified workers. From the results obtained, the total time spent on retrieving the old files was estimated as 1497mins (24hrs

95mins) while the total standard time was estimated as 176.58mins (29hrs 48mins) with an average value of 126.327mins (2hrs 11mins).The overall productivity index for the old filling system was estimated as 0.290. Similarly Table 4.1 shows the result for the newly developed filing system with an average observed time of 1.5mins over a range of 14days of observation. . From the result of 499 files observed, the total time spent on retrieving the newly developed files was estimated as 748.5mins (12hrs 45mins) while the total standard time was estimated as 884.29mins (15hrs 13mins) with an average value of 63.164mins (1hr 1mins) recorded. Hence the productivity index of this new filing system was calculated as 0.572, which shows a 49.3% increment when compared to the old filing system.

V. CONCLUSION

After a careful evaluation of the new filing system, we can conclude that the ease of retrieving the newly developed files is more preferable in terms of time reduction and accessibility. The time obtained in retrieving old files from the cabinet is much when compared to that of the newly developed files. Hence the productivity index of this new filing system was calculated as 0.528, which shows a 49.3% increment when compared to the old filing system.Therefore the workers were adjudged to be more productive when searching and retrieving files from a cabinet using this new system of filing.

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