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Obsolescence of Political Science Literature Cited In the Doctoral Dissertations of Kurukshetra University, Kurukshetra

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Abstract – The paper attempts to examine the obsolescence of literature in Political Science. The study is based on the 1738 citations, cited in the 14 doctoral dissertations of Political science awarded from the department of Political Science, Kurukshetra University. Kurukshetra during the period of 1998-2007.it is observed that journals and books are the most preferred bibliographic form of citations used by the research scholars, and they occupy 37.30% and 38.53% respectively.

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1. INTRODUCTION

Literature of a subject grows exponentially with time. The practical librarians, who administer growing collections in finite spaces, look to research on obsolescence to help them decide which items to keep and which to store or discard in order to make room for the new acquisitions. Obsolescence has been defined by Line and Sandison as the "decline over time in validity or utility of information." This concept is of obvious interest to information theoreticians who concern themselves with the development, career and eventual death or incorporation of particular kinds of information.

A measure of the obsolescence rate of literature, which can be assessed by citation analysis, can give an indication of how far a search must go back to obtain a representative sample of the published literature in a given field. Perhaps the most famous recent study of obsolescence has been the Kent's study at the University of Pittsburgh. The purpose of the study was to develop measures for determining the extent to which library materials are used and what the costs are, to improve acquisition decisions, and to determine storage or discarding points at which alternatives to local ownership of various items became feasible.

2. OBJECTIVES

The present study was conceived to study the characteristics of literature of political science, by determining half-life and certain other factors related to obsolescence, applying citation analysis techniques.

The objectives of the study are to determine the following factors:

- Annual Aging Factor (AAF)
- Half – Life (h)
- Mean – Life (m)
- Utility Factor (u)
- The Corrected Obsolescence (α) Factor in different disciplines of Social Science.

3. METHODOLOGY

The study focuses on the 1738 citations, cited in the 14 doctoral dissertations of Political science awarded from the department of Political Science, Kurukshetra University. Kurukshetra during the period of 1998-2007. All the references appended in the theses and their bibliographic details were collected, tabulated and analysed in order to study the obsolescence of journals and books.

4. ANALYSIS

The following tables show the citation frequency in the subject concerned.

TABLE 4.1: AGE-WISE DISTRIBUTION OF CITED JOURNALS CITATIONS

Journals					
Age Old (t)	No of Citations	Percentage of Citations	Cumulative Citations	Percentage of Cumulative Citations	Citations in 'tail' T(t)
1	2	3	4	5	6
0	16	1.87	16	1.87	855
1	22	2.57	38	4.44	839
2	20	2.34	58	6.78	817
3	27	3.16	85	9.94	797
4	19	2.22	104	12.16	770
5	26	3.04	130	15.2	751
6	30	3.51	160	18.71	725
7	26	3.04	186	21.75	695
8	18	2.11	204	23.86	669
9	25	2.92	229	26.78	651
10	16	1.87	245	28.65	626
11	23	2.69	268	31.35	610
12	21	2.46	289	33.8	587
13	19	2.22	308	36.02	566
14	18	2.11	326	38.13	547
15	15	1.75	341	39.88	529
16	23	2.69	364	42.57	514
17	17	1.99	381	44.56	491
18	9	1.05	390	45.61	474
19	15	1.75	405	47.37	465
20	3	0.35	408	47.72	450
21	18	2.11	426	49.82	447
22	11	1.29	437	51.11	429
23	12	1.4	449	52.51	418
24	14	1.64	463	54.15	406
25	17	1.99	480	56.14	392
26	12	1.4	492	57.54	375
27	20	2.34	512	59.88	363
28	12	1.4	524	61.29	343
29	15	1.75	539	63.04	331
30	16	1.87	555	64.91	316
31	12	1.4	567	66.32	300
32	4	0.47	571	66.78	288
33	6	0.7	577	67.49	284
34	18	2.11	595	69.59	278
35	17	1.99	612	71.58	260
36	28	3.27	640	74.85	243
37	34	3.98	674	78.83	215
38	11	1.29	685	80.12	181
39	19	2.22	704	82.34	170
40	9	1.05	713	83.39	151
41	19	2.22	732	85.61	142
42	2	0.23	734	85.85	123
43	12	1.4	746	87.25	121
44	11	1.29	757	88.54	109
45	1	0.12	758	88.65	98
46	2	0.23	760	88.89	97
47	9	1.05	769	89.94	95
48	2	0.23	771	90.18	86
49	4	0.47	775	90.64	84
50	9	1.05	784	91.7	80
51	24	2.81	808	94.5	71
52	3	0.35	811	94.85	47
53	7	0.82	818	95.67	44
54	21	2.46	839	98.13	37
55	9	1.05	848	99.18	16
56	7	0.82	855	100	7
	855	100			

TABLE4.2: AGE-WISE DISTRIBUTION OF CITED BOOKS CITATIONS

Books					
Age Old (t)	No of Citations	Percentage of Citations	Cumulative Citations	Percentage of Cumulative Citations	Citations in 'tail' T(t)
1	2	3	4	5	6
0	15	1.70	15	1.70	883
1	12	1.36	27	3.06	868
2	30	3.40	57	6.46	856
3	28	3.17	85	9.63	826
4	5	0.57	90	10.19	798
5	12	1.36	102	11.55	793
6	9	1.02	111	12.57	781
7	8	0.91	119	13.48	772
8	16	1.81	135	15.29	764
9	3	0.34	138	15.63	748
10	9	1.02	147	16.65	745
11	8	0.91	155	17.55	736
12	14	1.59	169	19.14	728
13	15	1.70	184	20.84	714
14	9	1.02	193	21.86	699
15	20	2.27	213	24.12	690
16	11	1.25	224	25.37	670
17	5	0.57	229	25.93	659
18	9	1.02	238	26.95	654
19	9	1.02	247	27.97	645
20	9	1.02	256	28.99	636
21	5	0.57	261	29.56	627
22	1	0.11	262	29.67	622
23	18	2.04	280	31.71	621
24	9	1.02	289	32.73	603
25	21	2.38	310	35.11	594
26	10	1.13	320	36.24	573
27	19	2.15	339	38.39	563
28	5	0.57	344	38.96	544
29	25	2.83	369	41.79	539
30	6	0.68	375	42.47	514
31	19	2.15	394	44.62	508
32	15	1.70	409	46.32	489
33	12	1.36	421	47.68	474
34	9	1.02	430	48.70	462
35	22	2.49	452	51.19	453
36	17	1.93	469	53.11	431
37	12	1.36	481	54.47	414
38	11	1.25	492	55.72	402
39	18	2.04	510	57.76	391
40	13	1.47	523	59.23	373
41	10	1.13	533	60.36	360
42	12	1.36	545	61.72	350
43	11	1.25	556	62.97	338
44	9	1.02	565	63.99	327
45	8	0.91	573	64.89	318
46	6	0.68	579	65.57	310
47	12	1.36	591	66.93	304
48	9	1.02	600	67.95	292
49	7	0.79	607	68.74	283
50	9	1.02	616	69.76	276
51	10	1.13	626	70.89	267
52	1	0.11	627	71.01	257
53	2	0.23	629	71.23	256
54	2	0.23	631	71.46	254
55	3	0.34	634	71.80	252
56	4	0.45	638	72.25	249
57	2	0.23	640	72.48	245
58	6	0.68	646	73.16	243
59	5	0.57	651	73.73	237
60	3	0.34	654	74.07	232
61	7	0.79	661	74.86	229

62	8	0.91	669	75.76	222
63	7	0.79	676	76.56	214
64	2	0.23	678	76.78	207
65	4	0.45	682	77.24	205
66	7	0.79	689	78.03	201
67	15	1.70	704	79.73	194
68	11	1.25	715	80.97	179
69	9	1.02	724	81.99	168
70	8	0.91	732	82.90	159
71	3	0.34	735	83.24	151
72	4	0.45	739	83.69	148
73	2	0.23	741	83.92	144
74	1	0.11	742	84.03	142
75	2	0.23	744	84.26	141
76	6	0.68	750	84.94	139
77	3	0.34	753	85.28	133
78	3	0.34	756	85.62	130
79	2	0.23	758	85.84	127
80	5	0.57	763	86.41	125
81	2	0.23	765	86.64	120
82	1	0.11	766	86.75	118
83	5	0.57	771	87.32	117
84	1	0.11	772	87.43	112
85	2	0.23	774	87.66	111
86	1	0.11	775	87.77	109
87	1	0.11	776	87.88	108
88	1	0.11	777	88.00	107
89	4	0.45	781	88.45	106
90	2	0.23	783	88.67	102
91	3	0.34	786	89.01	100
92	1	0.11	787	89.13	97
93	2	0.23	789	89.35	96
94	2	0.23	791	89.58	94
95	3	0.34	794	89.92	92
96	5	0.57	799	90.49	89
97	1	0.11	800	90.60	84
98	3	0.34	803	90.94	83
99	4	0.45	807	91.39	80
> 100	76	8.61	883	100.00	76
	883	100.00			

Tables 4.1 & 4.2 indicates citation frequency for Political Science in Kurukshetra University

ANNOTATION:

1. References as old as 100 years have been cited.

2. It may be observed that while books published 100 years ago have been cited, the periodicals cited go to the extent of 56 years.

3. While 70 % of the periodicals are within 34 years of age, the corresponding figure for books is 51 years.

4. It is interesting to note that 50% of periodical citations are within 21 years and books within 35 years.

The above findings reveal that in Political Science old literature is very important. The data of column 3 of Table 4.3 are plotted as frequency polygon 'AA' in figure 4.3. The curve 'AA' looks like a negative exponential distribution. The data indicate roughly declining trend in the frequency citations as against the cited ages. The points are concentrated at one end the curve tapers off gradually to zero at the other end while an initial build up occurs from the first entry.

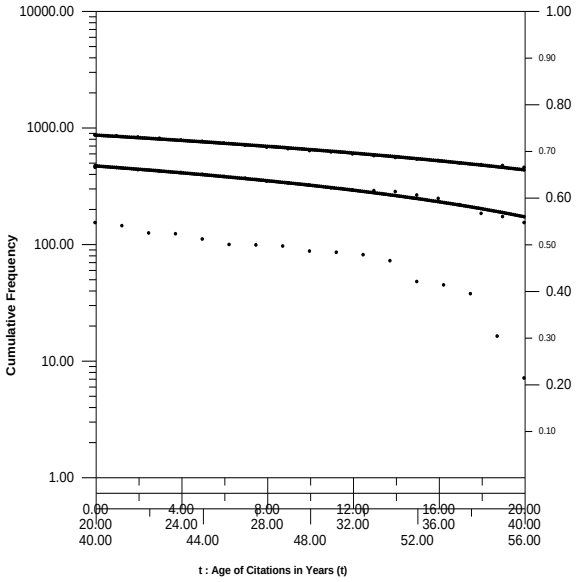

Figure 4.1: Semi Log Curves for T (t) and (t) Cited Journals

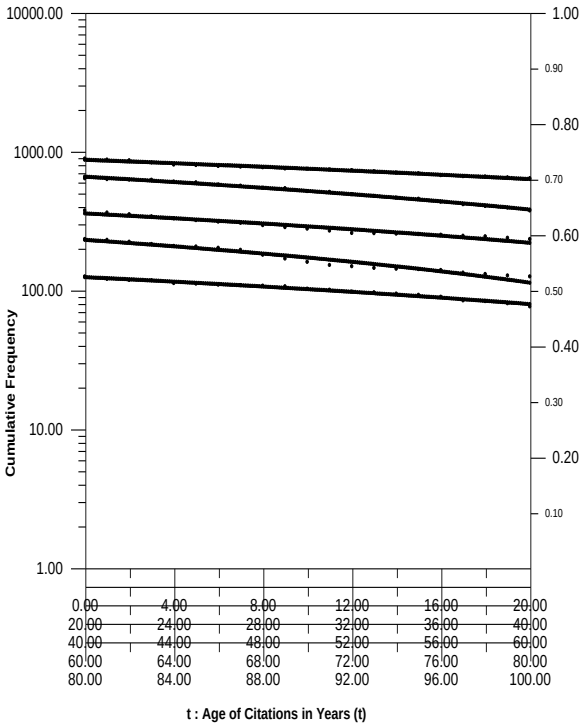

Figure 4.2: Semi Log Curves for T (t) and (t) Cited Books

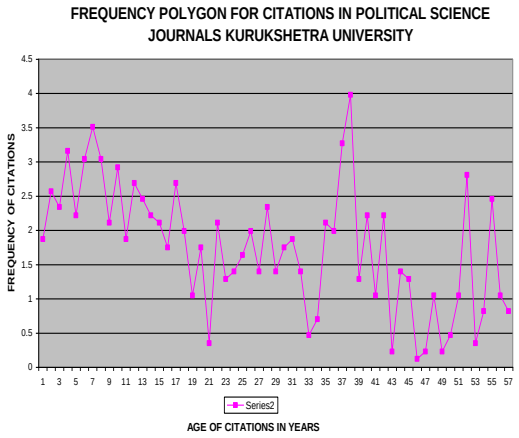

Figure 4.3

4.1 OBSOLESCENCE FACTORS OF LITERATURE CITED

The graphical method suggested by Brookes has been followed to compute the Annual Aging Factor (a) and further on the basis of 'a' the various obsolescence factors have been calculated. The data of column 6 of Tables 41 to 4.3 were plotted separately on a semi logarithmic graph paper taking cumulative frequencies of citations T(t) on Y-axis and the age of citations in years (t) on X-axis (Figures 4.1-4.2) XY, X1Y1 and X2Y2 represent on the semi logarithmic graph, for t=0 to 20; t-20 to 40; t=40 to 60 respectively T(t) is the citations in Tail that is the cumulative frequency of citations cited to t^{th} year. The straight line 'OA' is drawn parallel to the XY at the point T (t) = 10,000. On this line T (t) for t = 1 gives the value of t (1) = a_1 = a, the Annual Aging Factor.

The scale on the left hand side is graduated to find out the different values of 'a' directly from the graphs from 1.0 to 0.001. The straight line 'OA' directly forms the graphs from 1.0 to 0.001. The straight line 'OA' reads the values 't' = 0 to t=20 and the value for 'a' on the line of the extreme right is taken to the left hand side, another line 01A1 is drawn parallel to XY or OA to read the values for t=20 to t=40.

4.1.1 ANNUAL AGING FACTOR (a)

The Annual Aging Factor has been calculated using the following formula:

$T(t) = a^t$

The value of a, using OA and A1O1 was identified and the average values of 'a' was calculated and the same is given in Table 4.3. The average value of Annual Aging Factor of literature cited in Political Science Journals can be taken as 0.9755.

From this, it may be inferred that AAF of cited journals and books in different subjects of social sciences varies in Kurukshetra University. The reasons for this variation may be due to nature and characteristics of subjects.

4.1.2 HALF-LIFE (h)

Half-life is the period of time during which a half of the currently cited literature was published. The half-life can be determined from the graph such that the relation $a^h = 0.5$ will hold good.

$a^h = 0.5$

$$h = \frac{\log 0.5}{\log 'a'}$$

The Half-Life of literature cited as calculated from the above relation. The Half-Life of books is high when compared to journal articles.

4.1.3 MEAN LIFE (m)

The Mean (m) of the distribution can be obtained from Annual Aging Factor (a) using the following relationship;

$$\frac{1}{m} = -\log_e a$$

$m = \log_e 1/a$

The Mean-Life of cited journal articles and books show variation (Table 4.3).

4.1.4 UTILITY FACTUR (u)

The utility factor (u) has been calculated using the relationship.

$$u = \frac{1}{1-a}$$

This relationship shows that the Utility Factor will be high only when the AAF is high. It is observed that the lowest Utility Factor was found in journals and followed in increasing order in books.

4.1.5 CORRECTED OBSOLESCENCE FACTOR

The Obsolescence Factor (α) has been computed using the following formula:

$$\alpha = (0.5)^{\frac{1}{m}}$$

Accordingly, Corrected Obsolescence Factor (α) was determined is given in Table 4.3. It is observed that the Corrected Obsolescence Factor also found to be varying in both case of cited journals articles and books.

TABLE NO 4.3: SHOWING ANNUAL AGEING, HALF-LIFE, MEAN-LIFE AND UTILITY FACTORS FOR CITED JOURNALS AND BOOKS

Sr. No	Bibliographical Form	Annual Ageing Factor (a)	Half – Life (h)	Mean-Life (m)	Utility-Factor (u)	Corrected Obsolescence Factor (α)
1	Journals	0.9755	27.9437	40.3143	40.8163	0.983
2	Books	0.9821	38.3757	55.3644	55.8659	0.9876

5. GENERAL IMPLICATIONS

It is indicated from the above tables that the Research Scholars in Political Science have cited old documents. It will be useful to find out the nature of distribution of cited documents over a period to ascertain any definite relation among subjects. For this purposes graph of number of citations versus age of cited documents were developed individually (Figure 4.3).It is observed that the decay curve consists of two distinct portions, one corresponding to recent literature and the other to the older. The graphs show that the points are concentrated at one end, and the curve gradually tapers off to zero at the other end. Hence, it may be said that the pattern of distribution of citation follows a negative exponential distribution (Figure 4.3).

CONCLUSION

The librarian is faced with the problem of deciding on the matter of the optimum size of the document collection and back runs of the same, of ascertaining the utility of old volumes and old editions etc. There is no direct measure available to him, which would give him a clear cutoff value in terms of age of the documents. Generally, in a University Library, it would be easier to calculate the rate of obsolescence and derive a policy by which it would be possible to discard the old volumes of the same age. This technique, however, does not take into account the fact that some journals are more useful than the others are. This method would lead to a faulty weeding policy, and hence not the best solution to the problems. From the present study, it is noted that one cannot generalize the weeding policy; however, the decision should be taken by considering the subjects individually. Literature as old as 100 years in Political Science has been cited. Hence, after the respective period of a particular subject the documents may be weeded out or may be sent to the dormitory section.

From the above discussion, it can be concluded that the obsolescence factors such as annual aging, half-life, mean-life; utility factor for the cited journal literature and books varies in social sciences and the values are very high when compared to various subjects in science and technology. This variation may be due to the nature and subject characteristics of literature of social sciences. The findings have implications in the formulation of policies relating to the planning, organization and weeding of materials, bindings of books and journals; retrospective searching of literature etc. in libraries.

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