INSPEC database analysis for Knowledge Management records

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1. Introduction

There is no consensus about what constitutes knowledge management or even about whether knowledge can be managed. Data (Facts that have no intrinsic value), information (Data that is processed and analyzed such that it can be used to help make decisions), and explicit knowledge (Knowledge that can be articulated in language and documented) are readily documented and, therefore, clearly manageable. Tacit knowledge (Knowledge that cannot be articulated in language or documented because it is based on the personal experiences and context of the individual who possesses it) is highly personalized and internalized. There are several possible definition and descriptions of knowledge management from which to choose. Whichever is chosen it is imperative that it recognizes the strategic importance of knowledge management to organizational success. Knowledge management is about business, not technology [Tidd, 2004]. Shenton [2004] has well discussed the different facets of definitions particularly from the point of view of a researcher.

Barclay and Murray [1997] defined Knowledge management as an organizational activity that treats knowledge as an explicit concern of the organization and links positive organizational results to knowledge assets. Their original version referred to businesses, but it can be generalized to any organization with minor modifications. With those modifications, knowledge management is defined as an organizational activity that

- treats knowledge as an explicit concern of the organization and
- links positive organizational results to explicit and tacit knowledge assets.

The former requires that organizations adopt strategies, policies, procedures, and practices that support the collection and sharing of knowledge throughout their operations - at all levels and in all functional areas. The latter requires that organizations identify the intellectual

assets that can be used to enhance operations or sold as knowledge products [Dawson, 2000; Stewart, 2001].

The perspective of knowledge and knowledge management determines the focus of a knowledge management system (KMS) and its processes. Alavi and Leidner [2001] identified six such perspectives:

1. **Knowledge vis-a-vis data and information**: Data are inputs that create the information, which becomes knowledge when an individual processes it (hierarchical model). A KMS focuses on user assimilation of information.
2. **State of mind**: Knowledge is a state of knowing and understanding. A KMS provides access to sources of knowledge.
3. **Object**: Knowledge is an object to be stored and manipulated. A KMS helps gather, store, and transfer knowledge.
4. **Process**: Knowledge is the process of applying expertise. A KMS provides links among sources of knowledge to increase the depth and breadth of knowledge
5. **Access to information**: Knowledge is a condition of access to information. A KMS provides search and retrieval mechanisms for locating relevant information.
6. **Capability**: Knowledge is the potential to influence action. A KMS supports development of individual and organizational competencies.

Knowledge management refers to the harnessing of "intellectual capital" within an organization. Knowledge management theory discusses accessing and using all information within an institution, enabling individuals to apply pertinent information to what they already know, in order to create knowledge [Marshall, 1997].

Knowledge Management is an umbrella term for making more efficient use of the human knowledge that exists within an organization. Knowledge management is the 21st century equivalent of information management. It is essentially an industry trying to distinguish itself with specialized groupware and business intelligence (BI) products that offer a wide range of solutions.

The major focus of knowledge management is to identify and gather content from documents, reports and other sources and to be able to search that content for meaningful relationships. The related terms for knowledge management are: data mining, information management, groupware, and BI software.

Data management and artificial intelligence technologies can be combined to produce knowledge management systems that can analyze and evaluate massive databases. Rising user expectations, the advancement of computer technology, and the impact of the continuing information explosion are combining to hasten the transition from current data management systems to future knowledge management systems [Kellogg, 1987].

Knowledge management is, to a certain extent, the logical next step in a sequence of societal developments that has already been going on for a very long time. The likely future of knowledge management is explored along four perspectives: the management practices perspective, the information technology perspective, the organizational efforts perspective and the development, supply and adoption rate perspective [Wiig, 1997].

2. Materials & Methods

The past two decades have witnessed a sudden growth in 'Knowledge Management' research and produced a lot of literature. *INSPEC*, produced by IEE (The Institution of Electrical Engineers), is one of the most important databases for bibliographic references in the field of computers, control technology, and information technology. The present work provides the gist of the results of the bibliographic and scientometric analysis of the 'Knowledge Management' research publications in *INSPEC*. Similar studies have been carried out earlier by Vijai Kumar et al [2004] on Pressurised Heavy Water Reactor literature.

The search 'Knowledge Management' in basic index of the CD-ROM version of various databases resulted in a total of 7559 records as listed in Table 1.

Table 1: Distribution of 'Knowledge Management' related records in various databases

Database (period covered)	Number of retrieved records	Number of duplicate records	Number of distinct records	Percentage
INSPEC (1969 – 2004)	6260	0	6260	84.95
Library & Information Science Abstracts (1969 – 2001)	722	112	610	8.28
Science Citation Index (1982-Jan 2005)	396	73	323	4.38
International Nuclear Information System (1970 – Jan 2005)	156	1	155	2.10
Chemical Abstracts (1977 – 2004)	21	3	18	0.24
Analytical Abstracts (1980 – Feb 2005)	4	1	3	0.04
Total	7559	190	7369	100.00

INSPEC (1971 - 2004) had about 85 per cent of the total, when duplicates were removed keeping *INSPEC* as a base. The database structure of *INSPEC* has detailed classification system, which is lacking in other databases. Hence, the present study is limited to the *INSPEC* database only, for which bibliographic and scientometric analysis was carried out and self-explanatory Tables and Figures are given.

3. Results & Discussion

3.1 *Sources*

The authors of 6260 publications have chosen various publication channels like journals, conferences/seminars/workshops/symposia, books, reports, etc. to publish their works (Figure 1). Conferences, seminars, workshops, symposia are the most preferred channel of communication followed by journal articles.

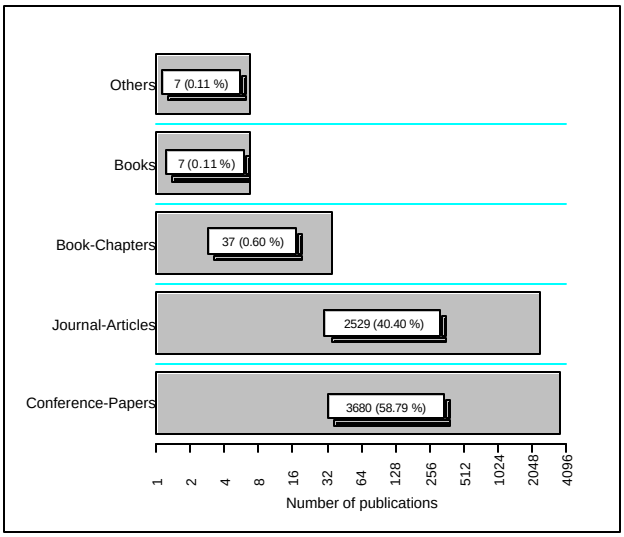

Figure 1.: Author preferred publication channels of 'Knowledge Management' research publications as per *INSPEC* (1971 - 2004)

Table 2 shows the most preferred journals to publish 'Knowledge Management' research articles. *Journal of Knowledge Management*, *International Journal of Information Technology and Management*, *Knowledge Management Research & Practice*, *International Journal of Technology Management*, and *Australian Journal of Information Systems* are the highly productive journals. Among the top ten journals the minimum period of coverage of the articles is two years and the maximum is nine years. The number of papers per year for the *Journal of Knowledge Management* is very high compared to other journals.

Table 2.: Source journals of 'Knowledge Management' research articles as per *INSPEC* (1971-2004)

Sr. No.	Journal Title	IF	II	No. of Papers	FPY-LPY	Papers/ Year
1.	*Journal of Knowledge Management*			165	1998-2004	23.57
2.	*Systemist*			13	2003-2003	13.00
3.	*International Journal of Electronic Business*			10	2003-2003	10.00
4.	*International Journal of Information Technology and Management*			17	2002-2003	8.50
5.	*Knowledge Management Research & Practice*			16	2003-2004	8.00
6.	*International Journal of Technology Management*	0.27	0.03	64	1996-2004	7.11
7.	*Australian Journal of Information Systems*			23	2001-2003	7.00
8.	*IBM Systems Journal*	1.97	0.94	17	2001-2003	5.67
9.	*Expert Systems with Applications*	1.07	0.07	44	1997-2004	5.50
10.	*Knowledge Management*			22	1999-2002	5.50
11.	*Journal of the Operational Research Society*			14	2001-2003	4.67
12.	*Industrial Management + Data Systems*	0.89	0.00	23	2000-2004	4.40
13.	*Journal of the China Society for Scientific and Technical Information*			25	2000-2004	4.40
14.	*Industrie Management*			25	1999-2004	4.17
15.	*DM Review*			13	2002-2004	4.00
16.	*Journal of Information Science*	1.07	0.61	15	2001-2004	3.75
17.	*NFD Information Wissenschaft und Praxis*			15	1999-2002	3.75
18.	*Management Science*	1.47	0.61	22	1999-2004	3.50
19.	*Computers and Law*			17	1999-2003	3.40
20.	*Ciencia da Informacao*			10	2001-2003	3.33
21.	*Sistemi & Impresa*			26	1996-2003	3.25
22.	*Computer Integrated Manufacturing Systems*			12	2001-2004	3.00
23.	*El Profesional de la Informacion*			14	1999-2003	2.80
24.	*Journal of Strategic Information Systems*			11	2000-2003	2.75
25.	*Information WEEK*			25	1996-2004	2.67
26.	*Cutter IT Journal*			13	1999-2003	2.60
27.	*European Journal of Information Systems*			13	2000-2004	2.60
28.	*IM Information Management*			13	1996-2000	2.60
29.	*Information Systems Management*			13	1999-2003	2.60
30.	*PC AI*			13	1997-2001	2.60
31.	*IEEE Intelligent Systems*	3.73	0.39	18	1998-2004	2.57
32.	*Information Management & Technology*			18	1998-2004	2.57
33.	*Business Information Review*			21	1997-2004	2.50
34.	*Educational Technology & Society*			10	2000-2003	2.50
35.	*Information Systems Frontiers*			12	1999-2003	2.40
36.	*Journal of Computer Information Systems*	0.08	0.02	25	1994-2004	2.27
37.	*Information Management & Consulting*			13	2000-2004	2.20
38.	*Organizacija*			13	1999-2004	2.17
39.	*Information Outlook*			17	1997-2004	2.13
40.	*Information Strategy: The Executive's Journal*			14	1998-2004	2.00
41.	*ZWF Zeitschrift fur Wirtschaftlichen Fabrikbetrieb*			17	1997-2004	2.00
42.	*Decision Support Systems*	1.32	0.30	33	1986-2004	1.68
43.	*Aslib Proceedings New Information Perspectives*			10	1999-2004	1.67
44.	*International Journal of Human Computer Studies*			13	1995-2002	1.63
45.	*International Journal of Intelligent Systems in Accounting, Finance and Management*			11	1996-2002	1.57
46.	*International Journal of Project Management*			15	1991-2003	1.15
47.	*Knowledge Based Systems*	0.84	0.17	16	1991-2004	1.14
48.	*International Journal of Information Management*			16	1990-2004	1.07

Sr. No.	Journal Title	IF	II	No. of Papers	FPY-LPY	Papers/ Year
49.	*Wirtschaftsinformatik*			12	1992-2003	1.00
50.	*Computers in Industry*			14	1989-2004	0.88
51.	*Communications of the ACM*			12	1991-2004	0.86
52.	*Informatie*			17	1983-2002	0.85
53.	*Human Systems Management*			15	1987-2004	0.83
54.	*Data & Knowledge Engineering*			11	1990-2003	0.79
55.	*Journal of Management Information Systems*			14	1987-2004	0.78
56.	*Information Resources Management Journal*			12	1989-2004	0.75
57.	*IEEE Transactions on Engineering Management*			10	1989-2004	0.63
58.	*Computer*			10	1985-2002	0.56
59.	*Information and Management*			12	1981-2003	0.52
60-66.	7 Journals with nine papers each			63		
67-75.	9 Journals with eight papers each			72		
76-89.	14 Journals with seven papers each			98		
90-107.	18 Journals with six papers each			108		
108-139.	32 Journals with five papers each			160		
140-171.	32 Journals with four papers each			128		
172-221.	51 Journals with three papers each			150		
222-351.	130 Journals with two papers each			260		
352-666.	315 Journals with one paper each			315		

(**IF** = Impact Factor and **II** = Immediacy Index as per JCR-2003; **FPY** = First Publication Year; and **LPY** = Last publication Year)

3.2 *Contents*

The *INSPEC* records are classified into five major categories: Physics; Electrical and Electronic Engineering; Computers and Control Technology; Information Technology; and Management in Manufacturing and Production Engineering. It has been observed that the 'Knowledge Management' records are classified into one subject class or cluster of more than one subject class. The cluster pattern based on the content of the records is given in Table 3.

Table 3: Content clusters observed for 'Knowledge Management' research as per *INSPEC* (1971 - 2004)

Primary class	Secondary class					Tertiary class
	A	B	C	D	E	
A = Physics	4 (0.06 %)	4 (0.06 %)	20 (0.32 %)			**A**
		12 (0.19 %)				**C**
B = Electrical and Electronic Engineering		**219** (3.50 %)	**287** (4.59 %)		11 (0.18 %)	**B**
			3 (0.05 %)			**D**
			12 (0.19 %)			**E**
C = Computers and Control Technology			**4993** (79.80 %)	**247** (3.95 %)	**139** (2.22 %)	**C**
				15 (0.24 %)		**E**
D = Information Technology				**230** (3.67 %)	5 (0.08 %)	**D**
E = Management in Manufacturing and Production Engineering					58 (0.93 %)	**E**

It is evident that Computers and Control Technology is the thrust area with 80 per cent of the records, where 'Knowledge Management' research is mainly concentrated. Influence of

Electrical and Electronic Engineering has also been evident with 287 records in the research areas as seen in 'Knowledge Management' using Computers and Control Technology.

There was one record, which is assigned with four subject classes viz. Electrical and Electronic Engineering; Computers and Control Technology; Information Technology; and Management in Manufacturing and Production Engineering.

The sub-classes of these 4993 Computers and Control Technology are analysed separately and the sub-classes with occurrences (alone and in combination with other subclasses) are given in Table 4. The sub-class 'C7100-Business-and-administration' appeared 1233 times followed by 'C6170-Expert-systems-and-other-AI-software-and-techniques' (1080 times), 'C6170K-Knowledge-engineering-techniques' (1055 times), 'C7210N-Information-networks' (775 times) and 'C0300-Management-topics' (448 times).

Table 4.: Sub-classes of 4993 Computers and Control Technology records with their number of occurrences as per *INSPEC* (1971 - 2004)

Computers and Control Technology sub-classes	No. of occurrences
C7100-Business-and-administration	1233
C6170-Expert-systems-and-other-AI-software-and-techniques	1080
C6170K-Knowledge-engineering-techniques	1055
C7210N-Information-networks	775
C0300-Management-topics	448
C1230-Artificial-intelligence	411
C6160Z-Other-DBMS	407
C7250R-Information-retrieval-techniques	335
C6150N-Distributed-systems-software	307
C6160-Database-management-systems-DBMS	296
C6130G-Groupware	267
C6130D-Document-processing-techniques	261
C7240-Information-analysis-and-indexing	255
C6160K-Deductive-databases	230
C7102-Decision-support-systems	228
C6110B-Software-engineering-techniques	227
C7160-Manufacturing-and-industrial-administration	212
C6120-File-organisation	209
C4210-Formal-logic	202
C7810C-Computer-aided-instruction	202
C0230-Economic,-social-and-political-aspects-of-computing	186
C4250-Database-theory	186
C7250-Information-storage-and-retrieval	176
C6130-Data-handling-techniques	168
C1160-Combinatorial-mathematics	167
C6160J-Object-oriented-databases	160
C0310F-Software-development-management	159
C7330-Biology-and-medical-computing	159
C6180-User-interfaces	152
C7140-Medical-administration	152
C6140D-High-level-languages	144
C6160D-Relational-databases	142
C7130-Public-administration	141
C7210-Information-services-and-centres	139
C7480-Production-engineering-computing	133
C6130M-Multimedia	132
C6115-Programming-support	127
C7120-Financial-computing	127
C6160B-Distributed-databases	125
C6180N-Natural-language-processing	121
C0310-EDP-management	120
C7250N-Search-engines	117

Computers and Control Technology sub-classes	No. of occurrences
C7210L-Library-automation	114
C6110-Systems-analysis-and-programming	103
C6160S-Spatial-and-pictorial-databases	98
C7220-Generation,-dissemination,-and-use-of-information	98
C6110J-Object-oriented-programming	97
C7104-Office-automation	88
C1230R-Reasoning-and-inference-in-AI	85
C6170T-Knowledge-engineering-tools	84
C7110-Educational-administration	82
C6110F-Formal-methods	79
C4210L-Formal-languages-and-computational-linguistics	73
C1140Z-Other-topics-in-statistics	67
C7820-Humanities-computing	62
C7420-Control-engineering-computing	61
C0220-Computing-education-and-training	55
C6110L-Logic-programming	55
C7400-Engineering-computing	55
C0000-General-and-management-topics	53
C7180-Retailing-and-distribution-computing	53
C6130S-Data-security	51
C7170-Marketing-computing	51
C1230L-Learning-in-AI	50
C0200-General-computer-topics	48
C1180-Optimisation-techniques	48
C5620-Computer-networks-and-techniques	48
C1290D-Systems-theory-applications-in-economics-and-business	47
C6130B-Graphics-techniques	47
C5290-Neural-computing-techniques	46
C5620L-Local-area-networks	46
C7230-Publishing-and-reproduction	46
C5260B-Computer-vision-and-image-processing-techniques	44
C6130E-Data-interchange	43
C7310-Mathematics-computing	41
C1140E-Game-theory	40
C1250-Pattern-recognition	40
C6160M-Multimedia-databases	40
C0310P-DP-personnel-management	39
C5620W-Other-computer-networks	38
C1240-Adaptive-system-theory	37
C7290-Other-aspects-of-information-science-and-documentation	36
C6180G-Graphical-user-interfaces	32
C7440-Civil-and-mechanical-engineering-computing	32
C3350-Control-in-industrial-production-systems	31
C7150-Military-computing	30
C0240-Ergonomic-aspects-of-computing	27

Computers and Control Technology sub-classes	No. of occurrences
C7460-Aerospace-engineering-computing	27
C1260-Information-theory	26
C7185-Administration-of-other-service-industries	26
C7250L-Non-bibliographic-retrieval-systems	26
C7840-Geography-and-cartography-computing	26
C1140-Probability-and-statistics	25
C7260-Information-science-education	25
C0310B-Computer-facilities	24
C1290F-Systems-theory-applications-in-industry	24
C7190-Other-fields-of-business-and-administrative-computing	24
C0230B-Legal-aspects-of-computing	23
C7000-Computer-applications	23
C6185-Simulation-techniques	22
C1230D-Neural-nets	21
C6150G-Diagnostic,-testing,-debugging-and-evaluating-systems	20
C7810-Social-and-behavioural-sciences-computing	19
C4240C-Computational-complexity	18
C7250C-Bibliographic-retrieval-systems	18
C1290-Applications-of-systems-theory	17
C5640-Protocols	17
C6130V-Virtual-reality	17
C0310D-Computer-installation-management	16
C4240-Programming-and-algorithm-theory	16
C5220-Computer-architecture	16
C7300-Natural-sciences-computing	16
C7340-Geophysics-computing	16
C7410F-Communications-computing	16
C6110P-Parallel-programming	15
C3355-Control-applications-in-manufacturing-processes	14
C7320-Physics-and-chemistry-computing	14
C1270-Man-machine-systems	13
C1290P-Systems-theory-applications-in-social-science-and-politics	13
C6150C-Compilers,-interpreters-and-other-processors	13
C7200-Information-science-and-documentation	13
C7450-Chemical-engineering-computing	13
C6150J-Operating-systems	12
C6100-Software-techniques-and-systems	11
C6110S-Software-metrics	11
C6155-Computer-communications-software	11
C7445-Traffic-engineering-computing	11
C7490-Computing-in-other-engineering-fields	9
C0310H-Equipment-and-software-evaluation-methods	8
C3390C-Mobile-robots	8
C4220-Automata-theory	8
C5260S-Speech-processing-techniques	8

Computers and Control Technology sub-classes	No. of occurrences
C6150E-General-utility-programs	8
C7820M-Machine-translation	8
C1220-Simulation,-modelling-and-identification	7
C3350G-Control-applications-in-chemical-and-oil-refining-industries	7
C3390-Robotics	7
C5440-Multiprocessing-systems	7
C7410D-Electronic-engineering-computing	7
C7860-Agriculture,-forestry-and-fisheries-computing	7
C3355C-Control-applications-in-machining-processes-and-machine-tools	6
C4130-Interpolation-and-function-approximation-numerical-analysis	6
C6110V-Visual-programming	6
C7430-Computer-engineering	6
C1340E-Self-adjusting-control-systems	5
C3360L-Aerospace-control	5
C4140-Linear-algebra-numerical-analysis	5
C4240P-Parallel-programming-and-algorithm-theory	5
C5260A-Sensor-fusion	5
C5470-Performance-evaluation-and-testing	5
C7108-Desktop-publishing	5
C7165-Public-utility-administration	5
C7390-Other-natural-sciences-computing	5
C1130-Integral-transforms	4
C1290L-Systems-theory-applications-in-biology-and-medicine	4
C3310-Natural-resources-and-environmental-control	4
C5320G-Semiconductor-storage	4
C5430-Microcomputers	4
C5630-Networking-equipment	4
C0130-Economic,-social-and-political-aspects-of-control	3
C1120-Mathematical-analysis	3
C1140G-Monte-Carlo-methods	3
C1250B-Character-recognition	3
C1250M-Image-recognition	3
C1290B-Systems-theory-applications-in-natural-resources-and-ecology	3
C1290H-Systems-theory-applications-in-transportation	3
C1290J-Systems-theory-applications-in-education	3
C1290Z-Other-applications-of-systems-theory	3
C3350Z-Control-applicatio ns-in-other-industries	3
C3355F-Control-applications-in-assembling	3
C4170-Differential-equations-numerical-analysis	3
C4188-Integral-transforms-in-numerical-analysis	3
C4290-Other-computer-theory	3
C5220P-Parallel-architecture	3
C5260-Digital-signal-processing	3
C7106-Word-processing	3

Computers and Control Technology sub-classes	No. of occurrences
C7410B-Power-engineering-computing	3
C7420D-Control-system-design-and-analysis	3
C7830D-Computer-games	3
C0100-General-control-topics	2
C1110-Algebra	2
C1140J-Markov-processes	2
C1210B-Reliability-theory	2
C1250C-Speech-recognition	2
C1260C-Cryptography-theory	2
C1310-Control-system-analysis-and-synthesis-methods	2
C1340F-Fuzzy-control	2
C1340K-Nonlinear-control-systems	2
C3340B-Control-of-heat-systems	2
C3375-Military-control-systems	2
C4100-Numerical-analysis	2
C4260-Computational-geometry	2
C5320K-Optical-storage	2
C5520-Data-acquisition-equipment-and-techniques	2
C5530-Pattern-recognition-and-computer-vision-equipment	2
C5630M-Multimedia-servers	2
C5690-Other-data-communication-equipment-and-techniques	2
C7470-Nuclear-engineering-computing	2
C7830-Home-computing	2
C7890-Other-special-applications-of-computing	2
C0110-Control-education-and-training	1
C1260S-Signal-processing-theory	1
C1290N-Systems-theory-applications-in-demography	1
C1320-Stability-in-control-theory	1
C1330-Optimal-control	1
C1340J-Distributed-parameter-control-systems	1
C1340-Specific-control-systems	1
C3120P-Chemical-variables-control	1
C3210G-Data-acquisition-systems-for-control	1
C3240-Transducers-and-sensing-devices	1
C3310C-Control-applications-in-agriculture	1
C3310E-Control-applications-in-mining,-oil-and-natural-gas-technology	1
C3310G-Pollution-control	1
C3350C-Control-applications-in-metallurgical-industries	1
C3350P-Control-applications-in-food-processing-industries	1
C3360B-Road-traffic-system-control	1
C3360D-Rail-traffic-system-control	1
C3360-Transportation-system-control	1
C3380L-Laboratory-control-techniques	1
C4150-Nonlinear-and-functional-equations-numerical-analysis	1
C4160-Numerical-integration-and-differentiation	1

Computers and Control Technology sub-classes	No. of occurrences
C4180-Integral-equations-numerical-analysis	1
C4240L-Logic-programming-theory	1
C5260D-Video-signal-processing	1
C5310-Storage-system-design	1
C5320C-Storage-on-moving-magnetic-media	1
C5670-Network-performance	1
C6140B-Machine-oriented-languages	1
C6140-Programming-languages	1
C6150-Systems-software	1
C7410H-Computerised-instrumentation	1

3.3 *Language*

Table 5 is the list of languages in which the 6260 'Knowledge Management' publications are brought out. English, German, Chinese, Japanese, Italian are the predominant languages in which more than 98 % of the articles are published. English language stands first with a highest share of 93.71 % publications.

Table 5: Language-wise distribution of publications of 'Knowledge Management' in *INSPEC* (1971 - 2004)

Language of publication	Number of Papers	Percentage	Cumul. percentage
English	5866	93.71	93.71
German	123	1.96	95.67
Chinese	97	1.55	97.22
Japanese	33	0.53	97.75
Italian	31	0.50	98.24
Spanish	23	0.37	98.61
French	21	0.34	98.95
Dutch	17	0.27	99.22
Portuguese	16	0.26	99.47
Slovenian	14	0.22	99.70
Korean	6	0.10	99.79
Hungarian	3	0.05	99.84
Polish	3	0.05	99.89
Russian	3	0.05	99.94
Czech	1	0.02	99.95
English; French	1	0.02	99.97
Slovak	1	0.02	99.98
Swedish	1	0.02	100.00

3.4 *Treatment*

INSPEC has given one or more than one treatment codes for each and every record in the database based on the nature of the work in the records. The following are the nine treatments used:

Application, Bibliography, Economic, General-or-Review, New-Development, Product-Review, Practical, Theoretical-or-Mathematical, and Experimental

Table 6 documents 6051 records in which treatment is as one category or two categories. Table 7 presents the nature of 83 records, which are treated as a combination of three categories. There are two records, which are treated as a combination of four categories as shown in Table 8. There are 124 records without any data about the treatment.

Table 6.: Dual treatments of 6051 'Knowledge Management' research publications in *INSPEC* (1971 – 2004)

1st treatment	2nd Second treatment								
	A	B	E	G	N	P	R	T	X
A (Application)	46			26		532		18	
B (Bibliography)		3		40		128		22	3
E (Economic)			18	15		12		4	
G (General-or-Review)				579		79		10	
N (New -Developme nt)	1				1	2		1	
P (Practical)	27	2				3585	25	251	82
T (Theoretical-or-Mathematical)			1					508	17
X (Experimental)									13

Table 7.: Triple treatments of 83 'Knowledge Management' research publications in *INSPEC* (1971 – 2004)

1st treatment	2nd treatment	3rd treatment	No. of publication s
A (Application)	B (Bibliography)	P (Practical)	20
A (Application)	P (Practical)	T (Theoretical-or-Mathematical)	11
B (Bibliography)	P (Practical)	T (Theoretical-or-Mathematical)	10
P (Practical)	T (Theoretical-or-	X (Experimental)	10
A (Application)	P (Practical)	X (Experimental)	4
A (Application)	G (General-or-Review)	P (Practical)	3
B (Bibliography)	E (Economic)	G (General-or-Review)	3
B (Bibliography)	E (Economic)	P (Practical)	3
B (Bibliography)	G (General-or-Review)	P (Practical)	3
A (Application)	B (Bibliography)	T (Theoretical-or-Mathematical)	2
B (Bibliography)	G (General-or-Review)	T (Theoretical-or-Mathematical)	2
B (Bibliography)	P (Practical)	X (Experimental)	2
N (New -Development)	P (Practical)	T (Theoretical-or-Mathematical)	2
A (Application)	B (Bibliography)	G (General-or-Review)	1
A (Application)	G (General-or-Review)	T (Theoretical-or-Mathematical)	1
B (Bibliography)	P (Practical)	A (Application)	1
E (Economic)	G (General-or-Review)	P (Practical)	1
E (Economic)	P (Practical)	T (Theoretical-or-Mathematical)	1
G (General-or-	P (Practical)	T (Theoretical-or-Mathematical)	1
G (General-or-	P (Practical)	X (Experimental)	1
N (New -Development)	P (Practical)	X (Experimental)	1

Table 8.: Quadruple treatments of two 'Knowledge Management' research publications in *INSPEC* (Jan 1971 – Nov 2004)

1st treatment	2nd treatment	3rd treatment	4th treatment	No. of publications
Application	Bibliography	General-or-Review	New-Development	1
Application	Bibliography	Practical	Experimental	1

3.5 *Review Articles*

INSPEC has identified 791 records among the 6260 records analysed as either General-or-Review type or Product-Review type. Figure 2 depicts the growth pattern of the 791 review type publications. There is a growth in number of review articles from the year 1998, whereas Product-Review type articles are being continued in *INSPEC* database as earlier.

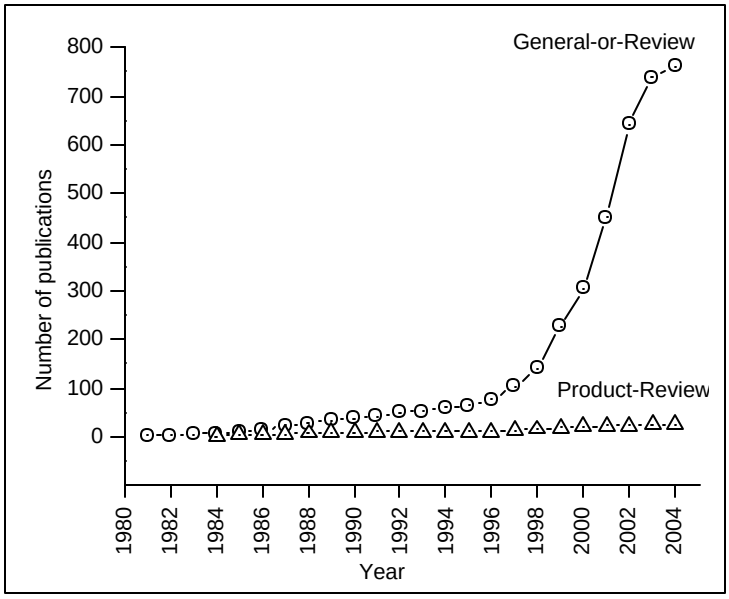

Figure 2.: Cumulative growth of General-or-Review, and Product-Review type records in *INSPEC* (1971 – 2004)

Table 9 listed the keywords associated with the publications marked as Product-Reviews in *INSPEC*. It is evident from the keywords that reviews are more done on softwares used for Knowledge Management. 'Expert systems' are also most researched area in 'Knowledge Management' as it is occurred six times among the keywords.

Table 9.: Product-Review related keywords with number of occurrences observed in *INSPEC* (1971 – 2004)

Product-Review keywords	No. of occurrences
software-reviews	12
expert-systems	6
groupware	4
software-packages	4
database-management-systems	3
information-resources	3
Internet	3
knowledge-management-system	3
relational-databases	3
software-tools	3
data-analysis	2
deductive-databases	2
development-systems	2

Product-Review keywords	No. of occurrences
document-handling	2
document-image-processing	2
document-management	2
information-retrieval-system-evaluation	2
information-retrieval-systems	2
information-storage	2
knowledge-base	2
knowledge-based-systems	2
management-information-systems	2
meta-data	2
online-front-ends	2
PROLOG	2
1st-Page	1

Product-Review keywords	No. of occurrences
68000-based-Unix-machines	1
Acrobat-PDF-results	1
Administration-Console	1
Adobe-Acrobat-Capture-2	1
aggressive-marketing-campaign	1
AI-technique	1
AI-technologies	1
algorithms	1
application-examples	1
application-generators	1
Arnold-Information-Technology	1
artificial-intelligence	1
artificial-intelligence-technology	1
asset-management	1
attributes	1
audio-files	1
authoring-systems	1
BackWeb-4.0	1
basic-DBMS-enhancements	1
bibliographic-systems	1
browser	1
business-card	1
business-data-processing	1
business-processes	1
buyer's-guides	1
CAD	1
CardScan-Executive	1
cataloguing	1
CD-ROM-databases	1
CD-ROMs	1
change-control	1
chemical-databases	1
chemical-information-sources	1
chemistry-computing	1
chemometrics	1
class-hierarchies	1
Columbia	1
commercial-production-version	1
Common-Lisp	1
Compaq	1
comparative-evaluation	1
competitive-intelligence	1
complex-links	1
composite-applications	1
consulting-firm	1
content-syndication	1
context-management	1
contextually-appropriate-answers	1
control-engine	1
control-strategies	1
conventional-databases	1
Corex-Technologies	1
corporate-data-management	1
CRM	1
cultural-implications	1
current-awareness-products	1
customer-relationship-management	1

Product-Review keywords	No. of occurrences
DACD	1
DADB	1
DAIN	1
data-access-pages	1
DataChannel-RIO-3.0	1
data-entry-forms	1
Data-Fellows	1
data-mining	1
data-sources	1
DEC-computers	1
dedicated-symbolic-crunch	1
deductive-database	1
Deductive-Systems	1
descriptive-statistical-methods	1
descriptor-frequency	1
diagrams	1
digital-dashboard	1
document-classification	1
document-collection	1
document-database-system	1
document-management-system	1
document-retrieval	1
drag-and-drop-tools	1
dynamic-global-access	1
Eagle	1
effective-leadership	1
electronic-information-networks	1
end-uses	1
enterprise-resource-planning	1
Enterprise-Unification-Platform	1
environmental-chemicals	1
environmental-databases	1
environmental-science-computing	1
environmetrics	1
ERP	1
EUP-4	1
expert-system-development-tool-G2	1
factographic-databases	1
Fact-System	1
frames	1
full-text-databases	1
fully-automated-Web-enabled-access	1
functionality	1
global-business-environments	1
graphical-interface	1
graphical-representations	1
graphic-files	1
group-decision-support-systems	1
Hasse-diagram	1
helpdesk	1
heterogeneous-structures	1
human-being	1
human-factors	1
hypermedia-markup-languages	1
icon	1
IKBMS	1
Illuminar-Folder	1

Product-Review keywords	No. of occurrences
image-files	1
image-scanners	1
industrial-computer-control	1
industrial-control	1
Inference	1
inferencing-features	1
InfoMation-Echo	1
information-infrastructure	1
information-management	1
information-publishing	1
information-retrieval	1
information-service-ranking	1
information-services	1
information-technology-tools	1
Ingres-Corporation	1
Ingres-DBMS-Server	1
integrated-software	1
integrated-system	1
integration-into-existing-data-processing-systems	1
Intelligent-Database	1
intelligent-knowledge-management-system	1
Internet-resources	1
intranet-site	1
Intraspect-1.5	1
iView -Studio	1
Kappa	1
KMS	1
knowledge-application-oriented-advanced-database	1
knowledge-based-management	1
knowledge-base-management	1
knowledge-base-management-system	1
knowledge-bases	1
knowledge-managemen	1
Knowledge-Management-Extension	1
knowledge-management-frameworks	1
knowledge-management-topic	1
KnowledgeX	1
layout-complexity	1
library-automation	1
library-materials	1
LISP	1
Logic-WorkBench	1
Lotus-Institute	1
Lotus-Notes	1
maintenance-scheduling	1
management	1
manufacturing-data-processing	1
media-combination-patterns	1
metadatabases	1
Microsoft	1
Microsoft-Access-2000-database-software	1
Microsoft-Exchange	1
Microsoft-SharePoint-Portal-Server-	1

Product-Review keywords	No. of occurrences
2001	
mouse	1
MS-DOS-PC-DOS	1
multiple-audience-types	1
natural-language-queries	1
nested-relational-model	1
new-features	1
news	1
News-Machine	1
Notes	1
objective-oriented-database	1
Object-Management-Extension	1
object-oriented-databases	1
object-oriented-programming	1
object-oriented-programming-facilities	1
object-oriented-systems	1
object-oriented-technique	1
objects	1
OCR-software-package	1
OCR-tools	1
office-automation	1
online-database-backup	1
online-databases	1
online-information	1
optical-character-recognition	1
optical-character-recognition-software	1
optional-GSI-data-server-components	1
organizations	1
paper-images	1
paradigm-shift	1
PBASE	1
Peregrine-ServiceCenter	1
performance	1
personal-management-skills	1
PFN-Continuum	1
popular-Ingres-relational-DBMS	1
pop-up-menu	1
portal-application-development	1
portal-technology	1
process-control	1
process-control-systems	1
programmers	1
programming-environments	1
Prolog-application-development-system	1
Prolog-BASEd-query-language	1
PROLOG-II	1
qualified-end-users	1
Quantum-Development-Corp.	1
queries	1
query-languages	1
RDBMS	1
real-time-expert-systems	1
real-time-inference	1
real-time-inference-engine	1
real-time-systems	1
real-world-activities	1
record-cataloguing	1

Product-Review keywords	No. of occurrences
record-creation	1
record-searching	1
relational-database-system	1
relational-deductive-database-system	1
relations	1
representation	1
Retrieval-Technologies-Inc.	1
robust-platform	1
robust-Windows-based-interactive-XML-development-environment	1
root-cause-record-creation	1
rule-checking	1
runtime-facilities	1
scanner	1
schemas	1
scientific-information-systems	1
search	1
Server	1
server-based-office-software	1
service-level-management	1
shells	1
shop-floor	1
Silogic	1
simulation-formulae	1
simulator	1
single-standalone-package	1
single-user-computer	1
software-assessment	1
software-review	1
specialized-workgroups	1
special-purpose-computers	1
special-purpose-hardware	1
SQL-like-DDL	1
SSL-network-security	1
statistical-analysis	1
stock-room	1
success	1
Symbolics-LISP-Machine	1
symbol-processing	1
Tahoe	1
TeamRoom	1

Product-Review keywords	No. of occurrences
technical-support-services	1
text-files	1
textual-materials	1
thin-client-support	1
tool-for-real-time-applications	1
TopTier	1
training	1
travelling-salesman-problem	1
travelling-salesman-problems	1
trouble-ticket-tracking	1
two-phase-commit-protocol	1
units	1
user-business-goals	1
user-profiles	1
VAX-RDB	1
Verano-Illuminar-2.0	1
video-files	1
virtual-applications	1
vocabulary	1
Web-based-portal-mini-application-service	1
Web-design	1
Web-page-tables	1
Web-sites	1
Wincite-5.0	1
workstations	1
World-Wide-Web-interface	1
XML-based-Web-services	1
XML-documents	1
XML-models	1
xmlspy-sup-5-Enterprise-Edition	1
XML-transformations	1
XSLT-files	1

3.6 *Growth of literature*

According to Gompertz the logistic growth of any field of knowledge ideally takes an extended S-shape [Sharma et al., 2002]. Figure 3 is the growth pattern of the 'Knowledge Management' literature, which has also taken an about to saturate shape during the small period.

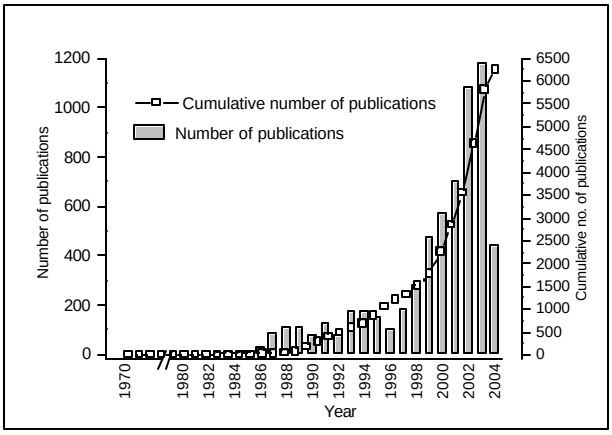

Figure 3: Growth of 'Knowledge Management' research publications as per *INSPEC*

3.7 *Authorship pattern*

Table 10 presents the nature of collaboration and the authorship pattern observed in the byline of the articles. The overall Collaboration rate is 0.64.

Table 10: Authorship and collaboration pattern observed in 'Knowledge Management' research publications in *INSPEC* (1971 – 2004)

Year	Number of papers under various authorships															Multi-authored papers	Tot. no. of papers	CR
	1	2	3	4	5	6	7	8	9	10	11	12	13	15	16			
1971		1														1	1	1.00
1980		1														1	1	1.00
1981		2	1	1												4	4	1.00
1982					1											1	1	1.00
1983	5	3														3	8	0.38
1984	9	1														1	10	0.10
1985	13	2		3												5	18	0.28
1986	17	8	3	1		1										13	30	0.43
1987	49	23	9	5	3	2										42	91	0.46
1988	44	42	19	4	4	2		1								72	116	0.62
1989	40	37	17	11	3		1	1	1							71	111	0.64
1990	29	22	15	6	6	1				1						51	80	0.64
1991	50	42	22	6	5	1	2							1		79	129	0.61
1992	36	23	14	3	2	2	2	1							1	48	84	0.57
1993	51	61	47	15	3	1		1								128	179	0.72
1994	59	66	41	11	1		1		1							121	180	0.67
1995	46	61	33	15	2											111	157	0.71
1996	25	35	23	12	7	3	1	1								82	107	0.77
1997	73	62	37	11	4	3				1						118	191	0.62
1998	130	78	52	19	4	1	2		2							158	288	0.55
1999	204	141	72	39	15	3				1		1				272	476	0.57
2000	212	181	125	37	12	5	1		1						1	363	575	0.63
2001	248	216	139	53	23	14	7	2			1					455	703	0.65
2002	376	329	226	82	37	14	8	5	5	2		1				709	1085	0.65
2003	422	387	220	104	28	11	6	3	1						1	761	1183	0.64
2004	118	134	69	31	12	5	1	2		1			1			256	374	0.68
Total	2256	1958	1184	469	172	69	32	17	11	6	1	2	1	1	3	3926	6182	0.64
%	36.6	31.6	19.2	7.6	2.8	1.1	0.5	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	63.4	100.0	

(**CR** = Collaboration Rate = Multi-authored papers divided by total number of papers)

3.8 *Prominent authors*

There are a total of 10086 distinct authors identified in 'Knowledge Management' publications in *INSPEC* (1971 – 2004) with 13445 total authorships. Table 11 is the list of authors to the 'Knowledge Management' literature. The top five authors are Abecker, A. with 20 publications followed by Su, S.Y.W. (18); Liebowitz, J. (17); Holsapple, C.W. (16); and Gottschalk, P. (13).

Table 11: Most productive authors (≥ 3 publications to their credit) in the field of 'Knowledge Management' research as per *INSPEC* (1971 – 2004)

Rank	Author	No. of papers
1	Abecker-A	20
2	Su-S Y W	18
3	Liebowitz-J	17
4	Holsapple-C W	16
5	Gottschalk-P	13
5	Jarke-M	13
5	Mentzas-G	13
5	O'Leary-D E	13
6	Becerra-Fernandez-I	11
6	Fensel-D	11
6	Harder-T	11
6	Newell-S	11
6	Studer-R	11
6	Tiwana-A	11
6	Yu-P S	11
7	Apostolou-D	10
7	Benjamins-V R	10
7	Bernardi-A	10
7	Lam-H	10
7	Park-E K	10
7	Rundensteiner-E A	10
7	Staab-S	10
7	Swan-J	10
8	Agrawal-D	9
8	Chilov-N	9
8	Desouza-K C	9
8	Greenes-R A	9
8	Levashova-T	9
8	Maedche-A	9
8	Pacholczyk-D	9
8	Pashkin-M	9
8	Ramesh-B	9
9	El-Abbadi-A	8
9	Handzic-M	8
9	Joshi-K D	8
9	Malhotra-Y	8
9	Mertins-K	8
9	Sintek-M	8
9	Smirnov-A	8
10	Althoff-K-D	7
10	Bellazzi-R	7
10	Callan-J	7
10	Ciravegna-F	7
10	Decker-S	7
10	de-Pablos-P O	7
10	Dessloch-S	7
10	Domingue-J	7
10	Fan-Zhi-ping	7
10	Frieder-O	7
10	Hasan-H	7
10	Heeseok-Lee	7
10	Hlupic-V	7
10	Holz-H	7
10	Karagiannis-D	7
10	Kontzer-T	7
10	Macintosh-A	7
10	Mattos-N	7
10	Maurer-F	7
10	Meng-Li	7
10	Ming-Syan-Chen	7
10	Motta-E	7
10	Mylopoulos-J	7
10	Pissinou-N	7
10	Prade-H	7
10	Rubenstein-Montano-B	7
10	Shadbolt-N	7
10	Smirnov-A V	7
10	Snyder-C A	7
10	Stefanelli-M	7
10	Voss-A	7

Rank	Author	No. of papers
11	Aha-D W	6
11	Bali-R K	6
11	Bertino-E	6
11	Davenport-E	6
11	de-Hoog-R	6
11	Dingsoyr-T	6
11	Dubois-D	6
11	Eick-C F	6
11	Fox-E A	6
11	Hai-Zhuge	6
11	Henninger-S	6
11	Hsinchun-Chen	6
11	Kinshuk	6
11	Ling-Liu	6
11	Maier-R	6
11	Makki-K	6
11	Maurer-H	6
11	Mitschang-B	6
11	Naguib-R N G	6
11	Nunamaker-J F -Jr	6
11	Peters-L S	6
11	Ram-S	6
11	Rasmus-D W	6
11	Richards-D	6
11	Roy-R	6
11	Scarbrough-H	6
11	Skuce-D	6
11	Snyman-R	6
11	Soliman-F	6
11	Stojanovic-L	6
11	van-Elst-L	6
11	Whinston-A B	6
12	Abidi-S S R	5
12	Alani-H	5
12	Allan-J	5
12	Barthes-J -P	5
12	Bell-D A	5
12	Beydoun-G	5
12	Birk-A	5
12	Bonifacio-M	5
12	Bouquet-P	5
12	Bressan-S	5
12	Carayannis-E G	5
12	Carson-E R	5
12	Chandra-C	5
12	Chatwin-C R	5
12	Cheah-Yu-N	5
12	Chen-A L P	5

Rank	Author	No. of papers
12	Cohen-M E	5
12	Compatangelo-E	5
12	Corby-O	5
12	Dayal-U	5
12	Dodero-J M	5
12	El-Sayed-M	5
12	Fei-Gao	5
12	Ferhatosmanoglu-H	5
12	Finin-T	5
12	Geller-J	5
12	Gronau-N	5
12	Hawryszkiewycz-I T	5
12	Hongjun-Lu	5
12	Howells-J	5
12	Hudson-D L	5
12	Jennex-M E	5
12	Jones-M	5
12	Kalfoglou-Y	5
12	Kingston-J	5
12	Laender-A H F	5
12	Lawrence-S	5
12	Lindvall-M	5
12	Meisel-H	5
12	Mesenzani-M	5
12	Metaxiotis-K	5
12	Miranker-D P	5
12	Montani-S	5
12	Nakamori-Y	5
12	Nissen-M E	5
12	O'Hara-K	5
12	Okamoto-T	5
12	Okunoye-A	5
12	Orman-L V	5
12	Probert-D R	5
12	Ramaprasad-A	5
12	Rose-T	5
12	Ruhe-G	5
12	Shimazu-H	5
12	Smith-J	5
12	Srinivasan-S	5
12	Srivastava-J	5
12	Stojanovic-N	5
12	Topaloglou-T	5
12	van-Harmelen-F	5
12	von-Wangenheim-A	5
12	Wang-Jun	5
12	Wang-X S	5
12	Weber-R	5

Rank	Author	No. of papers
12	Wickramasinghe-N	5
12	Wiig-K M	5
12	Woitsch-R	5
12	Xu-Qingrui	5
13	Akkermans-H	4
13	Apitz-R	4
13	Bandini-S	4
13	Barthes-J-P A	4
13	Bimson-K D	4
13	Black-W J	4
13	Bodendorf-F	4
13	Bohm-K	4
13	Borgida-A	4
13	Burris-L B	4
13	Byounggu-Choi	4
13	Cafeo-J A	4
13	Cairns-P	4
13	Chauvel-D	4
13	Chong-Sun-Hwang	4
13	Coffey-J W	4
13	Compton-P	4
13	Conradi-R	4
13	Corso-M	4
13	Courtney-J F	4
13	Croft-W B	4
13	Da-Silva-A S	4
13	Dattero-R	4
13	Davies-J	4
13	Degoulet-P	4
13	de-Souza-J M	4
13	Disterer-G	4
13	Dongsong-Zhang	4
13	Dubitzky-W	4
13	du-Toit-A S A	4
13	Dwivedi-A	4
13	Ergazakis-K	4
13	Fuhr-N	4
13	Fu-ren-Lin	4
13	Galliers-R D	4
13	Galup-S D	4
13	Gandon-F	4
13	Gauch-S	4
13	Gibbons-D I	4
13	Gomez-Perez-A	4
13	Gray-P H	4
13	Hahn-U	4
13	Hall-N G	4
13	Heisig-P	4

Rank	Author	No. of papers
13	Hemmje-M	4
13	Hendriks-P H J	4
13	Henrich-A	4
13	Hicks-R C	4
13	Hinkelmann-K	4
13	Hoffmann-A	4
13	Hoffman-R R	4
13	Hori-K	4
13	Huda-N	4
13	Hughes-J G	4
13	Hu-J	4
13	Hunter-A	4
13	Il-Yeol-Song	4
13	Ishikawa-H	4
13	Iyer-L S	4
13	Jae-Woo-Chang	4
13	James-A E	4
13	Jiawei-Han	4
13	Kacprzyk-J	4
13	Kafentzis-K	4
13	Karsten-H	4
13	Karypis-G	4
13	Kayama-M	4
13	Kellogg-C	4
13	Key-Sun-Choi	4
13	Kyu-Young-Whang	4
13	Lamontagne-L	4
13	Law-D Y F	4
13	Lesperance-R M	4
13	Lethbridge-T C	4
13	Lewkowicz-M	4
13	Lillehagen-F	4
13	Lina-Zhou	4
13	Lindgren-R	4
13	Lo-Storto-C	4
13	Loucopoulos-P	4
13	Maropoulos-P G	4
13	Martinez-Bejar-R	4
13	Massey-A P	4
13	Mattos-N M	4
13	McManus-D J	4
13	Meersman-R	4
13	Mizoguchi-R	4
13	Morgan-A P	4
13	Motik-B	4
13	Nahar-N	4
13	Neuhold-E	4
13	Nomura-T	4

Rank	Author	No. of papers
13	Nori-M	4
13	Oliveira-J	4
13	Ozsu-M T	4
13	Papazoglou-M P	4
13	Perl-Y	4
13	Pfahl-D	4
13	Psarras-J	4
13	Qing-Li	4
13	Rai-A	4
13	Rajkovic-V	4
13	Raschid-L	4
13	Reimer-U	4
13	Rezende-Y	4
13	Robertson-M	4
13	Rowley-J	4
13	Rus-D	4
13	Sage-A P	4
13	Sang-Wook-Kim	4
13	Selfridge-P G	4
13	Sembok-T M T	4
13	Semeraro-G	4
13	Sengir-G H	4
13	Shani-A B	4
13	Shih-Wei-Chou	4
13	Shintani-T	4
13	Simon-A M	4
13	Simone-C	4
13	Smets-P	4
13	Sorensen-C	4
13	Standing-C	4
13	Stenmark-D	4
13	Sugumaran-V	4
13	Sure-Y	4
13	Szafron-D	4
13	Tang-Ho-Le	4
13	Taylor-W A	4
13	Terveen-L G	4
13	Thomas-J	4
13	Tochtermann-K	4
13	Traunmuller-R	4
13	Travassos-G H	4
13	Travers-T	4
13	Uelpenich-S	4
13	Volz-R	4
13	Wadhwa-S	4
13	Wai-Lam	4
13	Walker-A	4
13	Wen-Youkui	4

Rank	Author	No. of papers
13	White-M	4
13	Winslett-M	4
13	Yager-R R	4
13	Yang-Y	4
13	Young-Gul-Kim	4
13	Zacklad-M	4
13	Zelm-M	4
13	Zheng-J	4
14	Abdullah-H A	3
14	Aberer-K	3
14	Abram-S	3
14	Aggarwal-C C	3
14	Aguilar-Martin-J	3
14	Ahmad-K	3
14	Alavi-M	3
14	Albolino-S	3
14	Alexander-J	3
14	Ali-N M	3
14	Amir-A	3
14	Anger-F D	3
14	Aref-W G	3
14	Arigoni-A O	3
14	Aroyo-L	3
14	Ash-C	3
14	Aumann-Y	3
14	Balasubramanian-P	3
14	Balogh-Z	3
14	Bandler-W	3
14	Bartlmae-K	3
14	Basili-V	3
14	Belardo-S	3
14	Bennett-M	3
14	Benn-W	3
14	Benson-S	3
14	Bergamaschi-S	3
14	Berztiss-A T	3
14	Bhargava-B	3
14	Biebow-B	3
14	Biggam-J	3
14	Bing-Liu	3
14	Binshan-Lin	3
14	Blessing-D	3
14	Bontis-N	3
14	Bor-sheng-Tsai	3
14	Bose-R	3
14	Boury-Brisset-A -C	3
14	Bowonder-B	3
14	Bresciani-P	3

Rank	Author	No. of papers
14	Brown-E W	3
14	Budin-G	3
14	Bullinger-H -J	3
14	Burn-J M	3
14	Burns-J R	3
14	Canas-A J	3
14	Cannataro-M	3
14	Carlson-D A	3
14	Carr-V	3
14	Catarci-T	3
14	Chen-F	3
14	Chengwen-Liu	3
14	Cheung-W M	3
14	Chun-Che-Huang	3
14	Chung-Sheng-Li	3
14	Chung-W W C	3
14	Chu-W W	3
14	Clarkson-P J	3
14	Classe-A	3
14	Clement-Y u	3
14	Coen-C S	3
14	Cooper-J W	3
14	Cooper-L P	3
14	Corcho-O	3
14	Coulson-Thomas-C J	3
14	Cox-E	3
14	Craw-S	3
14	Cremers-A B	3
14	Cronin-B	3
14	Crossley-M	3
14	Crowder-R	3
14	Damian-D E	3
14	Damiani-M	3
14	Dangelmaier-W	3
14	Das-A	3
14	Debenham-J	3
14	de-Campos-L M	3
14	Decker-B	3
14	de-Ferreira-Rezende-F	3
14	Delaitre-S	3
14	Despres-C	3
14	Devries-C	3
14	Dieng-Kuntz-R	3
14	Dieng-R	3
14	Dingli-A	3
14	Dittrich-K R	3
14	Dologite-D G	3
14	Droge-C	3

Rank	Author	No. of papers
14	Dullea-J	3
14	Dumais-S	3
14	du-Toit-A	3
14	Edwards-J S	3
14	Ee-Peng-Lim	3
14	Ellis-S	3
14	Elmasri-R	3
14	Erdmann-M	3
14	Ermine-J -L	3
14	Esposito-F	3
14	Fagrell-H	3
14	Falconer-J	3
14	Faloutsos-C	3
14	Falzon-P	3
14	Farrukh-C J P	3
14	Feldman-R	3
14	Ferrari-F M	3
14	Fierz-W	3
14	Fink-D	3
14	Flett-A	3
14	Ford-K M	3
14	Foster-P	3
14	Fox-M S	3
14	French-J C	3
14	Fujiwara-Y	3
14	Gaines-B R	3
14	Gao-J X	3
14	Garcia-R	3
14	Georgolios-P	3
14	Ghandeharizadeh-S	3
14	Ghani-R	3
14	Giboin-A	3
14	Giles-C L	3
14	Giorgini-P	3
14	Glover-E	3
14	Gnasa-M	3
14	Gopinath-M A	3
14	Goralwalla-I A	3
14	Gordon-J L	3
14	Grutter-R	3
14	Guntzer-U	3
14	Gupta-A	3
14	Gupta-B	3
14	Gupta-H	3
14	Gu-Xin-jian	3
14	Halper-M	3
14	Handschuh-S	3
14	Hanes-L F	3

Rank	Author	No. of papers
14	Han-J	3
14	Hanka-R	3
14	Hanley-S	3
14	Hauck-R V	3
14	Helal-A	3
14	Herder-P M	3
14	Herschel-R T	3
14	Hicks-D L	3
14	Hislop-D	3
14	Holden-T	3
14	Holmstrom-J	3
14	Huajun-Chen	3
14	Hughes-J	3
14	Huhns-M N	3
14	Iliopoulos-C	3
14	Ives-B	3
14	Izumi-N	3
14	Jagadish-H V	3
14	Jang-Hwan-Lee	3
14	Jarrar-M	3
14	Jeen-Su-Lim	3
14	Jiang-Liang-Hou	3
14	Jian-Tang	3
14	Jin-Cheon-Na	3
14	Jing-Zhang	3
14	Jones-R	3
14	Kamel-I	3
14	Karlapalem-K	3
14	Kesner-RM	3
14	Ke-Wang	3
14	Khandelwal-V K	3
14	King-Lup-Liu	3
14	King-W R	3
14	Kirikova-M	3
14	Kitamura-Y	3
14	Klein-M	3
14	Knowles-C	3
14	Koch-M	3
14	Koenig-M E D	3
14	Kohlas-J	3
14	Kohout-L J	3
14	Kouloumdjian-J	3
14	Kouramajian-V	3
14	Krawczyk-K	3
14	Krogstie-J	3
14	Kumar-S	3
14	Kunifuji-S	3
14	Kuntz-M	3

Rank	Author	No. of papers
14	Lanka-S	3
14	Larsen-M H	3
14	Lattner-A D	3
14	Lechner-U	3
14	Lee-J	3
14	Lehner-F	3
14	Leidner-D E	3
14	Lewis-J W	3
14	Ligomenides-P A	3
14	Liu-J	3
14	Liu-Jingjiang	3
14	Lochovsky-F H	3
14	Loebbecke-C	3
14	Lopez-Alonso-V	3
14	Lopez-Campos-G	3
14	Lucarelli-C M	3
14	Lueg-C	3
14	Lytras-M D	3
14	Mach-M	3
14	Madnick-S	3
14	Makinouchi-A	3
14	Malik-K	3
14	Manzoni-S	3
14	Margelisch-A	3
14	Marques-C	3
14	Marr-B	3
14	Martin-Sanchez-F	3
14	McAdam-R	3
14	McCracken-C	3
14	Melis-E	3
14	Merali-Y	3
14	Meyer-M	3
14	Mili-F	3
14	Mineau-G W	3
14	Missikoff-M	3
14	Mockler-R J	3
14	Mohan-K	3
14	Moral-S	3
14	Moreno-L	3
14	Moyes-A	3
14	Muller-W	3
14	Myoung-Ho-Kim	3
14	Nakata-K	3
14	Nastansky-L	3
14	Navathe-S B	3
14	Nemati-H R	3
14	Ng-P A	3
14	Niwa-K	3

Rank	Author	No. of papers
14	Ntuen-C A	3
14	Nurcan-S	3
14	Nurnberg-P J	3
14	Ogilvie-P	3
14	Olsen-B	3
14	O'Meara-D	3
14	Oppenheim-C	3
14	Osterle-H	3
14	Oxbrow-N	3
14	Palmer-J D	3
14	Pan-S L	3
14	Papavassiliou-G	3
14	Paradice-D B	3
14	Paralic-J	3
14	Park-E H	3
14	Pedersen-M K	3
14	Perez-A G	3
14	Peters-L	3
14	Phaal-R	3
14	Polat-F	3
14	Ponceleon-D	3
14	Portinale-L	3
14	Pouloudi-A	3
14	Poulymenakou-A	3
14	Prasad-B	3
14	Prekas-N	3
14	Prieto-J	3
14	Pu-C	3
14	Puuronen-S	3
14	Qiming-Chen	3
14	Qureshi-S	3
14	Rao-K S	3
14	Remus-U	3
14	Reynaud-C	3
14	Ribeiro-Neto-B	3
14	Rigallo-A	3
14	Rinaldi-F	3
14	Rodriguez-J	3
14	Rosenthal-Sabroux-C	3
14	Rosson-M B	3
14	Rouse-W B	3
14	Rozenblit-J W	3
14	Rubart-J	3
14	Rudnicki-P	3
14	SangKeun-Lee	3
14	Santoro-M D	3
14	Sartori-F	3
14	Sauquet-D	3

Rank	Author	No. of papers
14	Scarso-E	3
14	Schek-H-J	3
14	Scheuermann-P	3
14	Schindler-M	3
14	Sena-J A	3
14	Shaw-D E	3
14	Shen-S	3
14	Shi-Meilin	3
14	Shin-D	3
14	Shrufi-A	3
14	Shu-hsien-Liao	3
14	Sibte-Raza-Abidi-S	3
14	Siemieniuch-C E	3
14	Silva-A	3
14	Simonet-M	3
14	Sinclair-M A	3
14	Skyrme-D J	3
14	Sleeman-D	3
14	Slosser-E	3
14	Smith-A D	3
14	Snowden-D	3
14	Spies-M	3
14	Srivastava-D	3
14	Staes-F	3
14	Stanoevska-Slabeva-K	3
14	St-Clair-G	3
14	Steiner-K	3
14	Stonebraker-M	3
14	Strauch-J C M	3
14	Sturdy-D	3
14	Sun-Wei	3
14	Su-Xinning	3
14	Suzuki-F	3
14	Tacla-C	3
14	Tacla-C A	3
14	Tah-J H M	3
14	Tarabar-D B	3
14	Tarantino-L	3
14	Taylor-R M	3
14	Terrett-A	3
14	Terziyan-V	3
14	Thompson-J	3
14	Torasso-P	3
14	Treur-J	3
14	Tuggle-F D	3
14	Tyler-G	3
14	van-der-Spek-R	3
14	Wang-Chien-Lee	3

Rank	Author	No. of papers
14	Watson-I	3
14	Watt-S	3
14	Wee-Keong-Ng	3
14	Wei-Dai	3
14	Wei-Pang-Yang	3
14	Weiyi-Meng	3
14	Werstein-P	3
14	Wieczerzycki-W	3
14	Wiederhold-G	3
14	Wielinga-B J	3
14	Wiil-U K	3
14	Wilks-Y	3
14	Wille-R	3
14	Williams-M -A	3
14	Williams-M H	3
14	Wilson-L T	3
14	Wimmer-M	3
14	Wunram-M	3
14	Xu-Guohua	3

Rank	Author	No. of papers
14	Yamada-I	3
14	Yamaguchi-T	3
14	Yamasaki-H	3
14	Yeongho-Kim	3
14	Yokota-K	3
14	Yu-C	3
14	Yu-E	3
14	Yuh-Min-Chen	3
14	Yun-Wu-Huang	3
14	Zaki-M J	3
14	Zeleny-M	3
14	Zhaohui-Wu	3
14	Zhao-J L	3
14	Zhuang-Yan	3
14	Zowghi-D	3
1196 authors with two papers each		2392
8209 authors with one paper each		8209
Authors unknown		223

Lotka's Law on productivity of authors has been applied in case of Knowledge Management research. The results are shown through the Figure 4. According to Gupta [1996], Potter [1981], and Kalyane and Sen [1995], the value of α is modified to fit in or come closer to the ideal Lotka value of 2. The modified value is found as 2.8.

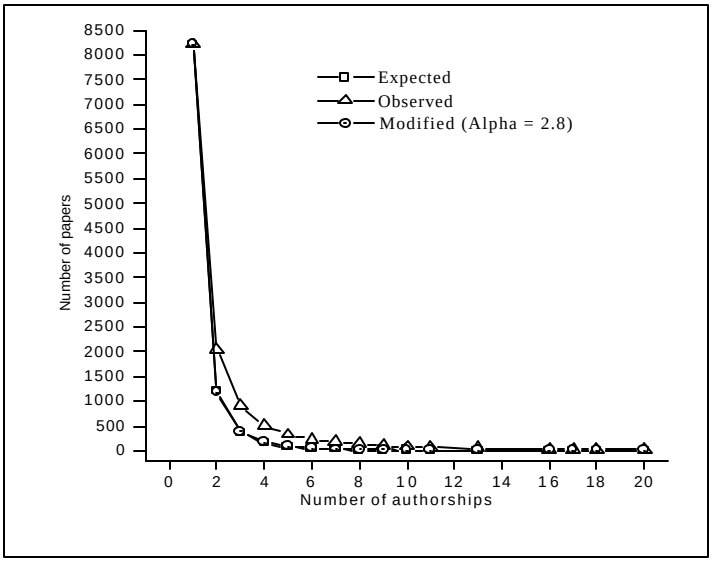

Figure 4.: Author productivity observed values, expected values (α = 2) as per Lotka's Law and modified values (α = 2.8) for the Knowledge Management research publications

3.9 *Country of Affiliation*

The 6260 'Knowledge Management' publications are analysed for the countries in the affiliation of the authors. There are a total of 78 countries from which authors have contributed to 'Knowledge Management' literature. Table 12 is the list of countries and the number of occurrence in the affiliation of authors. It has been found that authors from the three nationalities USA, UK and Germany in the forefront for the research on 'Knowledge Management', altogether contributing more than 40 per cent of the publications.

Table 12.: Author affiliation country-wise distribution observed in the 'Knowledge Management' research publications in INSPEC (1971 – 2004)

Affiliation country	Number of papers	Rank	Affiliation country	Number of papers	Rank
USA	1638	1	Bulgaria	8	35
UK	574	2	Romania	7	36
Germany	424	3	Colombia	6	37
France	257	4	Egypt	5	38
China	236	5	Thailand	5	38
Italy	188	6	Iran	4	39
Japan	187	7	Latvia	4	39
Canada	181	8	Tunisia	4	39
Australia	181	8	Algeria	3	40
Netherlands	146	9	Argentina	3	40
Spain	110	10	Croatia	3	40
South Korea	103	11	Estonia	3	40
Taiwan	87	12	Macedonia	3	40
Singapore	68	13	Saudi Arabia	3	40
Sweden	67	14	United Arab Emirates	3	40
Finland	67	14	Chile	2	41
Brazil	67	14	Cuba	2	41
Switzerland	66	15	Jamaica	2	41
Austria	66	15	Kenya	2	41
Greece	55	16	Lebanon	2	41
India	52	17	Luxembourg	2	41
Denmark	47	18	Macau	2	41
Malaysia	44	19	Ukraine	2	41
Norway	39	20	Bermuda	1	42
Belgium	36	21	Botswana	1	42
Poland	33	22	Iceland	1	42
West Germany	29	23	Indonesia	1	42
New Zealand	25	24	Kuwait	1	42
Portugal	23	25	Lithuania	1	42
South Africa	22	26	Mauritius	1	42
Russia	21	27	Palestinian Authority	1	42
Slovenia	18	28	Philippines	1	42
Mexico	18	28	Puerto Rico	1	42
Hong Kong	17	29	Swaziland	1	42
Israel	15	30	Uruguay	1	42
Hungary	14	31	Venezuela	1	42
Ireland	11	32	Yugoslavia	1	42
Turkey	11	32	Pakistan	1	42
Czech Republic	10	33	Anonymous	903	-
Slovakia	9	34	**Total**	**6260**	-

3.10 *Cited References*

The references in each of the records are analysed separately. Since the data range is 0 – 330 references and the deviation from the middle dense data is more, the descriptive statistics for the inter-quartile data is done and given in the Table 13. More than fifty percent of the publications have the references range of 1-20 references. Also there are 394 publications without a single reference. The average number of references was calculated as 16.03 with a standard deviation of 0.09.

Table 13.: References density in and descriptive statistics of 'Knowledge Management' research publications as per *INSPEC* (1971-2004)

No. of references	No. of publications	Descriptive statistics for inter-quartile data	
0	394		
1-20	3270	Mean	16.03
21-40	1480	Standard Error	0.09
41-60	351	Median	15.00
61-80	124	Mode	10.00
81-100	47	Standard Deviation	4.82
> 100	44	Sample Variance	23.23
Data not available	550	Range	17.00
Total	**6260**	Minimum	9.00
		Maximum	26.00
		Sum	45771.00
		Count	2856.00

4. Conclusion

Journals and conferences/seminars/symposia etc. are the chief sources in which 'Knowledge Management' works are published. *Journal of Knowledge Management, International Journal of Information Technology and Management, Knowledge Management Research & Practice*, *International Journal of Technology Management*, and *Australian Journal of Information* are major preferred journals. More than 80 per cent of the 'Knowledge Management' publications are falling in the 'Computers and Control Technology' subject category of INSPEC. Business-and-administration; Expert-systems-and-other-AI-software-and-techniques; Knowledge-engineering-techniques; Information-networks; and Management-topics are subfields of 'Computers and Control Technology' subject category in which most of the 'Knowledge Management' researches are carried out.

English stands as the predominant language in which more than 93 per cent of the works are published. Majority of the 'Knowledge Management' works are practical in nature or

general or review papers. There is a tremendous growth in number of publications after the year 1998. Over all collaboration rate is found as 0.64. A. Abecker, S.Y.W. Su, J. Liebowitz, C.W. Holsapple, and P. Gottschalk are identified as the prominent 'Knowledge Management' researches. Authors from USA, UK and Germany are in the forefront of 'Knowledge Management' research. The average number of references in the 'Knowledge Management' publications (inter quartile data) is found as 16.

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