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INFORMATION MANAGEMENT

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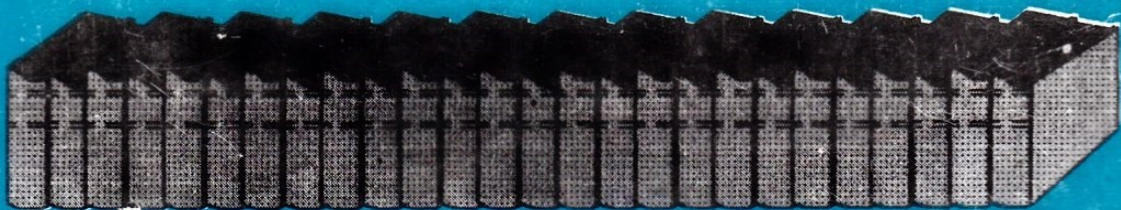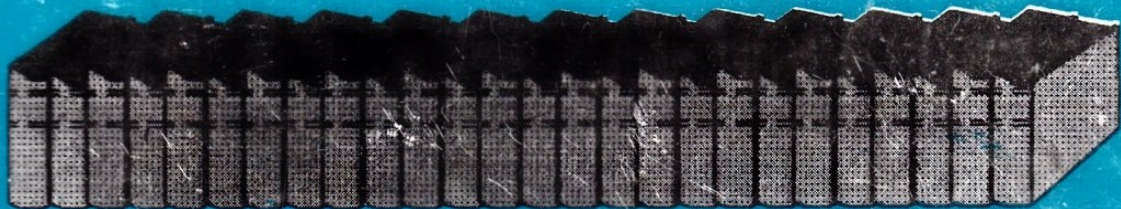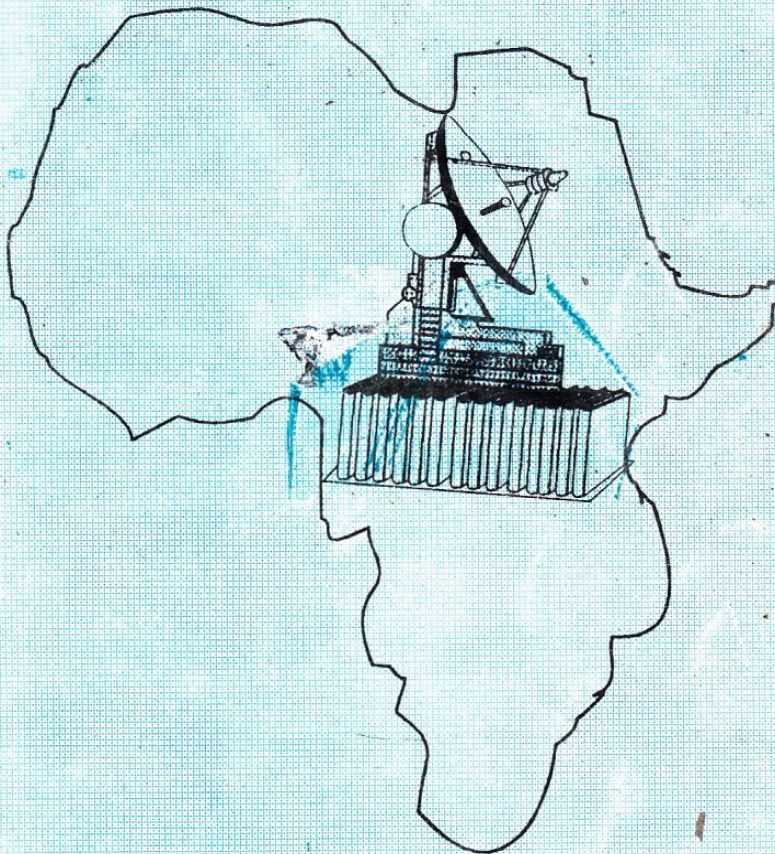
INDUSTRIAL MANAGERS UTILIZATION OF SCIENTIFIC AND TECHNOLOGICAL INFORMATION IN NIGERIA

by

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ABSTRACT

In Nigeria, research and development are concentrated in research institutes, universities and polytechnics. This study sought to investigate industrial manager's consultation of STI sources and the extent of contribution of institutional of STI sources for development. Results show that even though research institutions are not often consulted, they contribute greatly to the total STI utilization for development. There is a call for more interactive strategies for feedback between knowledge producers and knowledge users in Nigeria.

INTRODUCTION

Nigeria spends a considerable amount of money on research and development through investment in universities and other research institutions, but she still has to import most of her needs. Not only is Nigeria still far from the realisation of a self sustaining industrial base, the fact remains that her minimum industrial base is itself impaired by chronic structural deficiencies (Etim 1992).

Scholars of library and information science have advanced several theories to explain the factors governing the generation, dissemination and utilization of information. The information capacity theory (Shannon and Weaver, 1949) indicates that personality variable such as qualification, experience, creativity and intuition may affect the way information is perceived and utilized. The theory implies that the decision to select and utilize a certain information source is a perceived evaluation of the probability or expected value of that source (Opeke, 1982). To that extent also, the impact of research and training in science and technology can be maximised if research finding and technologies derived thereby are made available in forms suitable for

absorption and utilized by those who need the information. This paper aims at discussing the utilization of scientific and technological information by industrialists in Nigeria. Specifically, it will find out the scientific and technological information sources consulted and the extent of utilization of institutional sources of scientific and technological information.

RESEARCH QUESTIONS

1.   What are the types of scientific and technological information sources mostly consulted by industrial managers?

2.   To what extent do industrial managers utilize the institutional scientific and technological sources of information?

METHOD OF RESEARCH

The study adopted a descriptive design using the survey approach and carried out "ex-post facto".

Location and Target Population

The subjects under study were the industrial managers of Nigeria's medium and large scale manufacturing industries. Industries surveyed were based on the industries listed in the Nigeria Industrial Directory (1989), a publication of the Manufacturer's Association of Nigeria.

Sampling Procedures and Sample

The multistage sampling technique was used to get a sample population of industries surveyed. One thousand nine hundred and seventy four (1,974) industries are listed in the MAN directory (MAN, 1989). The cluster sampling technique was therefore used to select states from the three geographical zones grouped by MAN (i.e States with at least 60% of industries in the zone and have representatives of all the industrial sectors (Stratified sampling).

With each stratum, the choice of industries was random and withing each industry, there was complete census of industrial managers.

Data Collection Instrument

Data for this study was collected by means of questionnaire. Dichotomous questions of "yes" or "no" were used to survey the background information on industrial managers and information sources consulted while a five point likert scale was used to rate industrial managers' extent of utilization of information.

Instrument Administration

The research instrument was sent to 600 industries i.e 30% of the total population of industries listed in the MAN directory. A total of 420 responses were received. Twenty six of these were not usable because of conflicting answers thus bringing the total number of usable questionnaire to 403 representing 67.1% responses. Therefore 403 industrial managers were used for the study.

DATA ANALYSIS

A Z-score analysis was used to produce a ranking of types of STI sources while multiple regression analysis was used to ascertain the extent of contribution of research institutions to the total scientific and technological information utilized in Nigeria. An analysis of variance was computed to determine if the contributions are significant.

RESULTS

TABLE 1
Personal Information on the Industrial Managers (n = 403)

Personal Variable	Nominal or Numerical Value	No of Cases	% of 403 Total
Age	Over 55 years	9	2
	46 - 55 years	36	9
	36 - 45 years	181	45
	20 - 35 years	177	44
sex	Male	282	70
	Female	121	30
Nationality	Nigerian	399	84
	Foreigners	64	16
Highest Qualification	Doctorate Degree	21	5
	Masters Degree	181	45
	Bachelors Degree	165	41
	HND	28	7
	OND/NND	8	2
	Over 10 years	5	1
Work Experience	(7-10) years	52	13
	(4- 6) years	165	41
	(1- 3) years	181	45
Professional Associations	Yes	359	89
	No	44	11

BACKGROUND INFORMATION OF INDUSTRIAL MANAGERS

Table 1 shows personal information of industrial managers under survey. They are in the age bracket of twenty years and above. 70% of them are males while 84% are Nigerians. Their educational qualifications vary between Ordinary National Diploma

(OND), Higher National Diploma (HND), bachelors, masters and doctorate degrees They have varied work experiences ranging from one to ten years. 89% of them are members of professional associations. Respondents can therefore be seen as representatives of Nigeria's industrial managers.

Research Question One: What are the types of scientific and technological information sources mostly consulted by industrial managers in Nigeria?

Analysis of the types of scientific and technological information sources consulted by industrial managers are shown in Table 2.

Table 2: **Z-score and Rank of Scientific and Technological Information (STI) Source of Positive Responses**

Types of STI Sources	Frequency of Positive Responses	Z-score	Rank
1. Newspaper/Magazines	90	- 0.38	8
2. Learned Journals	293	1.00	5
3. Books/Monographs	340	1.32	4
4. Indexing/Abstracting	66	- 0.55	9
Services	394	1.69	2
5. Conference Proceeding	401	1.74	1
6. Professional Association	387	1.64	3
7. Contact with Peers	43	- 0.71	10
8. Theses and Dissertation	238	0.63	6
9. Research Institutions	108	- 0.26	7
10. Library/Information Centres			

$X = 236$ $SD = 146.4$

Professional associations ranked first with a z-score of 1.74 followed by conference proceedings (z-score 1.69) and contact with peers (z-score 1.64). Surprisingly libraries and information centres (z-score - 0.26) ranked second to last - 7 the while newspapers and magazines (z-score - 0.38) ranked eight and last.

The finding tally with those of Crane (1972) and Odeinlie and Alabi (1989) whose research revealed that informal scientific communications and the processes and products of science and technology are inextricably bound together in a mutually - interdependent social system. This again emphasizes the "invisible college phenomenon", that is a small group of eminent scientists in a research area who maintain

contact with one another and thereby monitor the rapid changes taking place in their field.

Non-members of the invisible college have more difficulty obtaining needed information than one who is a member (Crane 1972). This explains the very high use of professional associations as source of STI. In other words, professional associations, conferences and contact with peers are parts of the invisible colleges.

The moderately ranking of research institutions (6th) and learned journals (5th) as preferred source types is noteworthy, considering the amount of funding given to these institutions by the Nigerian government. Learned journals and theses/dissertations are products of the research institutions. This finding questions the justification for the existence and high level of support of these institutions by the Nigerian government.

The extremely low ranking of indexing and abstracting services (z-score - 0.55), library and information centres (z-score - 0.26) is again as expected, considering the very vague understanding and perception of the functions and capabilities of libraries and information centres in Nigeria. The functions of libraries and information centres as information processors/disseminators involving the collection, analysis, interpretation and dissemination of bibliographic and numerical information are very much underestimated in Nigeria by potential library users.

Research Question two: To what extent do industrial managers utilize the scientific and technological institutional sources of information.

Table 3:   Summary Data of Multiple Regression Analysis on extent of utilization of STI by Research Institutions

Multiple   R 0.77491
R^2 0. 6005
Standard Error   5. 75516
Analysis of Variance

	Sum of Squares	Mean Squares	F
Regression 26	3032.550	116.636	4.306*
Residual 376	10177.22668	27.067	

* Significance $P \leq 0.05$

Table 3 shows a multiple regression analysis of the extent of utilization of STI from Research institutions Nigeria. R^2 (0.6005) indicates that these research institutions contribute altogether 60.05% to the total STI untilization in Nigeria.

The ANOVA indicates that the calculation $f = 4.309$ which is greater than the critical value (1.79). This shows that Research Institutes contribute significantly to the utilization of STI in Nigeria.

Even though research institutes ranked 6 out of 10 in the information sources consulted in Nigeria, a test of actual utilization of STI produced by them for technological development shows a great extent of significant contribution.

Institutional STI Source	Data Weight	Remark
1. Agric Extension Research & Liason Service Zaria	00.03	NS
2. Cocoa Research Institute of Nigeria Ibadan	-0.02	NS
3. Federal Inst. Of Industrial Research Oshodi	0.07	S
4. Forestry Research Inst. Of Nigeria, Ibadan	-0.02	NS
5. Inst. For Agric. Research & Training Ibadan	-0.02	NS
6. Inst. For Agric Research, Saria	-0.01	NS
7. National Inst. For Freshwater Res. New Bussa	-0.03	NS
8. Lake Chad Research Inst. Maidugri	0.02	NS
9. National Research Inst. For Chem. Tech. Zaria	0.05	S
10 National Animal Prod. Res. Inst. Zaria	-0.03	NS
11. National Cereals Res. Inst. Bida	0.02	NS
12. National Inst. For medical Res. Lagos	0.05	S
13. National Horticultural Res. Inst. Ibadan	0.01	NS
14. National Inst. For Pharmaceutical Abuja	0.01	NS
15. Nat. Office of Industrial Property Lagos	0.51	S
16. National Root Crops Research Inst. Umuahia	-0.03	NS
17. National Veterinary Research Inst. Jos	-0.01	NS
18. National Building & Road Res. Lagos	0.07	S
19. Nigerian Inst. For ocean & Marine	0.01	NS
20. Nigerian Inst. for Trypanosomiasis Res. Lagos	0.02	NS
21. Nigerian Stoned Products Res. Inst. Ilorin	-0.03 -	NS
22. Nigerian Inst. For Oil Palm Research Benin	0.01	NS
23. Projects Development Agency Enugu	0.05	S
24. Rubber Research Inst. Of Nigeria, Benin	0.06	S
25. Nat. Centre for Genetic Res. of Biotech. Ibadan	-0.01	NS
26 Nat. Raw Mat. Res. & Rev. Council, Lagos	0.62	S
27. Universities and Polytechnics	0.16	S

Beta weight of extent of ETI contribution of each institutional source was computed to show what each institution contributed to the overall 60.05% contributed by research institutions as a variable. Only eight (8) showed significant contribution to the overall contribution of all research institutes.

Findings negate the existence of these institutions. They also question the functionality of the parent bodies of these institutions - The Federal Ministry of Science and Technology, Federal Ministry of Industries and Federal Ministry of Education - as organs of government to promote, administer and co-ordinate scientific and technological research for development. The only possible explanation could be that of

poor machinery for the popularization of research findings by these institutions rather than non-productivity. It brings to focus the poor accessibility and dissemination mechanisms employed by the knowledge producers.

IMPLICATIONS AND RECOMMENDATIONS

Recognition of the importance of scientific and technological information in the developing of Nigeria, the implications of the findings of this study are discussed with suggested recommendations.

The findings that industrial managers in Nigeria depend very heavily on the contact with peers and related activities for acquisition of scientific and technological information implies that industrial managers have a professional attitude. It is recommended that measures be taken by government and industrial companies to strengthen interactive links between research institutions and manufacturing organisations.

The findings that the products of research institutions are largely neglected by industrial managers is to be viewed very seriously. It implies that government investment in the establishment and support of these institutions is not producing descried results. Utilization of research information should be ensured by both industrial companies and research institutions.

CONCLUSION

The study has investigated, 'and discussed the utilization of scientific and technological information by industrial managers in Nigeria. It is hoped that if strong inter-relationships are created between the knowledge producers and knowledge users there will be increased utilization of scientific and technological information for development in Nigeria.

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