

LABOUR COMPOSITION FOR MAINTENANCE WORKS IN PUBLIC HOSPITAL BUILT ENVIRONMENT IN SOUTH-WEST, NIGERIA

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Abstract

The study examined the labour composition for maintenance works in the public hospital buildings in South-West, Nigeria, and in the process identified if there are any significant differences in the execution of maintenance works using outsourcing and in-house labour. In achieving the objective, the study adopted research survey technique with a total of 552 questionnaires comprising 206 for maintenance staff and 346 for users of public hospital collected and used for the study. The survey covered 46 public hospitals representing 40% of the total number of public hospitals existing in South-West, Nigeria. It comprises all the 11 federal owned hospitals and 35 selected states owned based on stratified random sampling technique. Data collected were analysed using descriptive and inferential statistics.

The findings of the study revealed that there is no variation in the work performed by the use of in-source and outsourced labour. However, maintenance staff rated the use of in-source better than outsource in that it is found to produce higher quality and better quality control of services, reduction in cost while outsourced gives an understanding of latest technologies with better access to special skills.

Based on the above findings, the study recommends that maintenance staff should be well motivated. For optimum results, maintenance departments need to adopt sound policies, as this will provide appropriate basis for preparing budgets that will meet the actual maintenance needs of the hospital buildings and services. Maintenance managers are to do their best to prepare realistic need-based budgets while the government should make efforts to improve funding for hospital maintenance. Inefficiencies and inflexibility through the imposition of bureaucratic impediments to operational effectiveness should be avoided in hospital environment due to the sensitivity of the services being rendered. Maintenance staff and users of hospital buildings should be given opportunities for further training on their jobs also on effective use of hospital facilities.

Keywords: : Maintenance, Hospital Building, Public Hospital, Outsourcing and in-house labour.

Introduction

Government-owned hospitals are confronted with unique challenges that threaten their existence. Through an examination of the history, characteristics, and structure of public hospitals, it is found that they lack the capacity to compete in a market-driven economy (Iyagba, 2005). This deficiency is further found to originate from the institution's inherent government structure, which promotes inefficiencies and inflexibility through the imposition of bureaucratic impediments to operational effectiveness.

What makes a hospital a special facility is the 24 hours a day and 7 days a week facility they provide. Furthermore, a mistake in a hospital building management can cost the lives of many human beings at a time. These characteristics represent unique operating conditions and a bottom-line that involves much greater stakes than the profit-only vision of most business ventures. According to Nours Hospital Consultants (2002), a hospital is not a mere building, but a complex social institution that handles the dynamics of life and death situations during the process of rendering health care. There is need to evaluate the existing maintenance of public hospital buildings and services in order to improve their standard if need be, for effective health care delivery in South West, Nigeria.

According to Onifade (2003), in Nigeria, installed health facilities are as old as the hospitals themselves. Some of the medical equipment are unserviceable and need outright replacement. The colonial architecture in some of the older hospitals, which were hitherto famous for their sturdiness and functionality, has now become less attractive because of the general neglect of the buildings maintenance. Overcrowding has also led to deterioration of these facilities. The state of maintenance and the physical surroundings in public hospital buildings have resulted into health problems in public health care delivery. Patients in government healthcare facility are often fearful, uncertain about their health and safety. All these call for investigation into the state of maintenance management of public hospital buildings in South West, Nigeria. The measure is to improve the methods of managing and executing maintenance works on them for effective delivery of health care. Most of the public hospital maintenance organizations lack the rationale for prioritising their work. Most often, maintenance works are not carried out according to actual need, but they are dictated by financial priorities. Inadequate funding of maintenance all over the world has made the prioritisation of maintenance demands a critical issue. Maintenance works in public hospitals are often complex in nature. Most managers are often confronted with the problem of deciding which particular method of executing maintenance works to adopt- either out-sourcing or the use of in-house staff. Management of any process also involves assessment of performance and in order for any maintenance manager to measure performance and set priorities, the function and performance of buildings and their appropriate standards will be dependent on the users' perception and their primary needs. It calls for assessment of user's perception of their satisfaction with work done by the hospital maintenance department.

All these also call for the formulation of appropriate maintenance programmes especially in health related buildings. Healthcare systems are costly and inpatient treatment in hospitals is a major part of these costs. The major issue is on how greater efficiency be achieved without compromising the core business of the hospital, which is to take care of patients. It is based on this background that this study aims at assessing the delivery methods used in executing maintenance work programme in public hospital buildings in South West, Nigeria.

To achieve this the study objective was set to find out if there are any significant differences in the quality of outsourced maintenance work and that of the in-house work in the maintenance of public hospital buildings in South West, Nigeria.

The study also set an hypothesis that there is no variation in the maintenance efficiency between work performed by out-sourced labour and in-house labour in public hospitals in South West, Nigeria.

An Overview of Manpower Source for Maintenance Works Execution.

The execution of maintenance works is the practical realisation of all the management decisions, designs and dreams for maximizing the results of maintenance efforts. According to Adebayo, (1991), maintenance works are complex in nature and therefore are carried out by directly employed labour while some are carried out by contractors. According to the author, the mode of execution of maintenance works is a matter of policy. It is the maintenance policy of the establishment that dictates whether directly employed labour, or contractors, or both will be most advantageous. Lee (1987) states that the major problems confronting the maintenance manager are the decision on a particular method of executing maintenance works. According to him, contractors and

therefore the choice between should handle some maintenance works direct and contract labour must be made.

Seeley (1976) stipulated that in reaching a decision, the maintenance manager should compare the costs and services provided by the contractors with his own directly employed labour force, taking into account the availability of labour, the type and location of the building to be maintained. Lee (1987), contends that the choice should be according to which offers the greater advantage in terms of cost, quality and convenience. It is also noted that there are certain specialist maintenance works that should normally be handled by contractors. To the author, direct labour organizations will only function well where necessary facilities are provided. The Chartered Institute of Building (1975) reiterates that the sizes, types and number of buildings to be maintained will invariably determine the source of manpower either in service or outsourcing. Seeley (1975) re-affirms that successful execution of maintenance work, be it direct labour or by contract depends on well-detailed specifications, good planning and supervision.

Arditi (1997), in his own contribution exclusively states the reasons for using in-house personnel to deliver maintenance services. According to the author, using in-house staff will give a better control of the services. Along with service control, it reduces the costs, getting a higher quality of work and achieving more flexibility in staffing. There is a better adjustment to workload fluctuations. To the author, he believes that if they have better control of the maintenance operations by using in house staff, then they will also be able to keep costs down, ensure high quality works and respond to maintenance calls in a timely fashion by adjusting the size and the work schedules of their staff. Stone et al (1984), Holland (1987), Lee (1987), Chanter and Swallow (1996), and the findings of (Gregerson,1994) support this result. According to Arditi (1997), firms that outsource maintenance services use exclusively competitive bidding (61%) when selecting their contractors whereas 23% exclusively use negotiation, and 16% use both. To the author, competitive bidding is expected in principle to result in the most economical offer from a competent contractor, but the paper work involved in the process is sometimes overwhelming. According to him, negotiation appears to be a viable alternative, particularly for short term and low budget works.

Iyagba (2005), in his own contribution states that outsourcing holds the promise of flexibility and profitability, and that there may be disadvantages that are not all that obvious. Another major attraction, as noted by the author is that it allows the business to focus on its core business and competencies, leaving peripheral and support functions to be serviced by outside experts. To the author, for smaller employers, outsourcing also has the advantage of a reduction in numbers, possibly removing the business from the statutory thresholds of increased obligations, including submission of employment equity plans. Iyagba (2005) further states that before a business embark upon outsourcing there are a few potentials downsides to consider; firstly he states that the employers must contract only with reputable service providers with a proven track record of compliance and good human relation capability. Secondly, , where outsourcing involves dismissal of staff that become redundant, it may contribute to the country's chronic unemployment problem. Thirdly, there is still uncertainty in legal circles over whether, and under what circumstances, outsourcing constitutes a transfer of a business as a going concern, therefore in using the method, good legal advice should be obtained. Fourthly, employers sometimes outsource non-core functions to existing staff with the idea that they would become entrepreneurs by supplying expertise back to the old employer as independent contractors. A fifth problem is that the introduction of a service provider in the form of a labour broker may upset established relations and create friction between the employer's

own employees and those of the service provider. Another less obvious problem is the fact that long-term exclusive outsourcing arrangements create a dependency that might isolate the organization from the market. According to the author, by giving the vendor the exclusive right to understand one's business, one may be making it harder in the longer term to terminate the relationship. The vendor, may in turn, build up relationships with the business peers and partners and become a surrogate in dealing with them. To the author, unless the rules are clearly spelt out and the business makes an effort to maintain its visibility, there is a real risk of its relationships with them disappearing? Conclusively, while outsourcing offers potential benefits in terms of cost, service levels and access to talent, it is a strategic decision requiring careful thought about risks, benefits and governance. The compendium of Estates Good practice (2005) in their research believe that the unique nature of an institutions estates, its location, availability of craftsmen and the preference of the estate director will all feature in the choice between direct or contract workers. According to them, the success of the operation will rely on management, adequate supervision and quality control. To the authors, it is unlikely it will prove desirable to dispense with in service labour organization as there are many benefits to employing a small group of craftsmen directly, particularly if they are multi-skilled that include: Familiarity with the assets; Understanding how the assets operate; Awareness of the maintenance requirements; Quick response time in the case of emergencies are also of significant importance; Aiding security role and there can be personal commitment and loyalty to the institution. However according to the authors, there are disadvantages of employing an in-house labour team as well which will require consideration in that:

- They are full-time appointments, and therefore sufficient work must be available to fully utilise them or they drain resources and full training is required.
- They can lack the simulation of other work and differing environments.

Shohet (2003), in his examination of the proportion of maintenance works performed by outsourcing versus in-house provision in hospital buildings re-affirm that the choice of either of the method will depend on the occupancy rate. To the author, he divides hospital into high occupancy hospitals (over ten patient beds per 1000 sq. m.) and hospitals with standard or low levels of occupancy (up to ten patient beds per 1000sq. m). In his regression analysis, it shows that, when a hospital occupancy level is standard or low, outsourcing results in a saving of approximately 8 percent (8%) in maintenance expenditure. On the other hand when hospital occupancy levels are higher than planned, the use of in-house provision leads to a 6 percent (6%) saving in maintenance expenditures. This is due to the fact that the deterioration of some of the building systems under high occupancy conditions is accelerated, and a high availability of maintenance personnel is required for breakdown maintenance. Therefore, under such conditions, in-house provision offers opportunity for savings. This conclusion differs from that of previous studies on the subject (Australian Industry Commission, 1996). At standard or low occupancy levels, there is indeed an advantage as well as savings in the employment of a manpower composition in which the majority of the maintenance workers are external personnel. On the other hand, at high occupancy levels, there is a clear benefit from manpower compositions in which the majority of personnel are in-house maintenance workers.

Conclusively, it can be observed that the choice of either in-house services or outsourcing for maintenance operations will depend on some parameters that the author will observe while the investigation is in progress.

Methodology

The study covers all federal government university teaching hospitals, Orthopaedic, Psychiatric Hospitals and selected state hospitals randomly sampled in South-West, Nigeria. A total of 46 public hospitals were used for the study out of 114 public hospitals (Health-Centres exclusive) existing in the South-West, Nigeria. The study adopted survey research techniques. The simple random sampling method was chosen so as to give equal chances to all the state hospitals. Two categories of questionnaires were designed for this study directed to the maintenance staff and the users of these selected public hospital buildings respectively.

A total of 690 questionnaires were sent out to the selected public hospitals, out of which 230 were directed to the maintenance staff and 460 were directed to the users of the selected public hospital buildings respectively. Thus, a total 552 questionnaires were completed and used for the analysis.

Presentation of Results

The Hospitals Studied

South-West, Nigeria consists of six states namely Lagos, Ogun, Ondo, Ekiti, Osun and Oyo. They are located within the same geographical zone, having similar social-cultural backgrounds. In all, the region has a total of 114 public hospitals (Health – Centres exclusives). From the population, forty-six (46) hospitals including all the federal owned hospitals and selected state hospitals were examined for the study. This represents about 40% of government owned hospitals.

The length of service distributions in table 3 indicates that majority of the respondents have a working experience less than 10 years (57.1%) while maintenance staff with better experience through the length of service are less than 15% altogether (respondents with 20 – 30 years and above). This is an indicator that the maintenance work execution may be lacking maintenance technical expertise in the execution of maintenance programme especially in the public hospitals in South-west, Nigeria.

Table 4 indicates that most of the maintenance departments in the public hospitals have an employee ranging between 1 and 20 with 48% of them having not less than 11 to 20 employees in their organization. This is an indication that there is inadequate staff strength in maintenance departments more so that much is needed especially in a sector that handles the dynamics of life and death during the delivery of health services.

Table 5 shows the number of buildings available for maintenance in public hospitals in South-west, Nigeria. From the table, only 15% of the hospitals examined have more than 30 and above buildings for their health care delivery system. This is an indication that majority of the public hospitals in Southwest, Nigeria have inadequate building stock for effective healthcare delivery. The complex nature of hospitals, with various medical treatments coupled with large population of attendance indicates that the existing building stock is not adequate for a healing environment needed for patients and staff.

Users of Hospitals Building Survey.

Table 6 indicates the department of the users of public hospital buildings sampled in the South West, Nigeria. 40% of the total population sampled was allocated to medical staff. The justification for this was that they constitute the highest percentage of workers in a hospital environment. This is followed by the administrative staff (30%) with a proportion of about 10% of total management level. Response from the patient was found to be very low. This is actually expected from the respondents.

Provisions of Training Programme for Users On How To Effectively Manage the Facilities Within the Hospital Building.

Figure 2 indicates that majority of the users are only provided with user's guide with less than 40% of them being considered for in-service training.

Table 7: indicates that the management of public hospitals in South West, Nigeria only provide seminars and workshop training in most case for their maintenance staff. 29.5% of the respondents claimed to have in-service training while only 5% have access to higher education.

Level of Motivation of Maintenance Staff by the Management

From Fig.3, the level of motivation by the management to ensure better performance of the maintenance staff is rated average. This is an indication that much are not expected from the maintenance staff.

From table 8, the response to causes of low motivation is found to be very low (75 respondents). Half of the respondents (50.7%) rated lack of working tools/equipment/materials as a cause of low motivation in executing the desired maintenance programmes in public hospitals. Other demotivating factors are; the irregular payment of salaries (16.0%), delay in promotion (10.7%), poor pay (8%) etc.

Labour Source for the Maintenance Works Execution in Public Hospitals Buildings in South West, Nigeria

Figure 4 shows that half of the maintenance work execution (50.8%) are executed through selective outsourcing while about 37.3% maintenance work are carried out using in-house staff in the maintenance department. This is an indication that the two predominant labour sources are the in-source and outsourcing. The use of outsourcing more than in-source may be as a result of the complex nature of hospital building with delicate mechanical and electrical systems.

Mode of Selection of Contractors for Maintenance Work.

Figure 5 shows that the three modes of selection are usually considered for selecting contracting for executing maintenance work. Although, selective tendering method takes the highest percentage (45.3) and this may be due to the complex nature of hospital services. The sensitivity of the environment is also of paramount important since they handle the dynamics of life and death during the delivery of health care services. Expertise is needed for handling some projects.

Table 9, shows that the predominant bases of award of contract for maintenance works execution are through the use of Bill of Quantities (39.8%) and Cost Reimbursement (37.4%). Less than a quarter (22.8%) of the respondent award their contract using schedules of rates. This is an indication that the 3 methods are often used by the public hospitals when awarding contract for maintenance work.

From table 10, majority of the decisions on the implementation of maintenance works by either outsourced or in-house crew are made by the maintenance manager (38.6%). There are indications from the analysis that consideration would be given to the volume of work (15.2%) the nature of work (13.0%) and maintenance policy (13.6%) guiding the organisation for executing maintenance programme. The management being the final decision maker generally on all the policies guiding the organisation may have to take advice from the maintenance manager especially on work related to maintenance operations.

Hypothesis: There is no variation in the maintenance efficiency between work performed by out-sourced labour and in-sourced labour in public hospitals in South West, Nigeria.

From table11, executing maintenance programmes using outsourcing gives latest innovations/technologies to work done and special skills better than implementing in-source. In-source method, gives a better quality of services, reduction in cost of operation, better control of services with minimum equipment downtime and reduction in equipment expenditure than outsourced method. Both methods claimed to produce specialized expertise to their labour, better adjustment to workload fluctuation and security to work done. All these efficiencies are better rated in in- source method than outsourcing.

Paired Samples Correlations

	N	Correlation	Sig.
Pair 1 OUTSOURC & INSOURC	12	.688	.000

The correlation coefficient, r , is 0.688 which shows that the relationship between both is strong and positive. T-test analysis shows that t -cal is -1.996 and $p > 0.01$ we therefore accept the null hypothesis that there is no variation in the maintenance efficiency between work performed by out-sourced labour and in-sourced labour in public hospitals in South West, Nigeria. Also, Kendall's Coefficient of Concordance Chi-Square has a value of 1.660 and $p > 0.01$, an indication that there is no significant difference between the in-source and outsource when compared in terms of their efficiency.

Summary of findings

The study revealed that more than half of the maintenance staff (57.1%) in public hospitals in South-West, Nigeria has a working experience less than 10 years within the maintenance organisation. This is a factor that may affect job performance of the maintenance operatives. The staff strength of the maintenance department in public hospitals is found to be inadequate more so that it is a sector that handles the dynamics of life and death especially during the delivery of healthcare services. Majority of the users (61.8%) have no access to any training programme especially on the effective management of facilities within the hospital environment. The few percentage claimed to have got access to training was by reading the maintenance users' guide distributed by

the management. Workshops and seminars are the major training (65.5%) given to the maintenance operatives. The maintenance operatives are found not to be well motivated. The low motivation was attributed to lack of tools /equipment /materials in executing the desired maintenance programmes in hospitals. Other reasons are irregular payment of salaries, delay in promotion etc. Half of the maintenance work execution (50.8%) are executed through selective outsourcing while about 37.3% maintenance work are carried out using in-house staff in the maintenance department. The use of outsourcing more than in-source may be as a result of the complex nature of hospital building with delicate mechanical and electrical systems. The modes of selection usually considered for selecting contractors for executing maintenance work are; open tendering, negotiating and selective tendering method. The selective tendering takes the highest percentage (45.3) and this may be due to the complex nature of hospital services. The predominant bases of award of contract for maintenance works execution are through the use of Bill of Quantities (39.8%) and Cost Reimbursement (37.4%). Less than a quarter (22.8%) of the respondent award their contract using schedules of rates. The maintenance manager makes decisions on the implementation of maintenance works by either outsourced or in-house crew. There are indications from the analysis that consideration is always given to the volume of work; the nature of work; and maintenance policy guiding the organisation when decisions are to be made in respect of works execution. From the study, using outsourcing gives latest innovations/technologies to work done and special skills better than implementing in- source. In-source method, gives a better quality of services, reduction in cost of operation, better control of services with minimum equipment downtime and reduction in equipment expenditure than outsourced method. Both methods claimed to produce specialized expertise to their labour, better adjustment to workload fluctuation and security to work done. All these efficiencies are better rated in in-source method than outsourcing.

Conclusion

From the results obtained in this study, the following conclusions are made. The staff strength of the maintenance department in public hospitals in South West, Nigeria is inadequate. They do not have much experience on hospital maintenance management. Majority of the users of public hospital buildings do not have access to any formal training programme on effective use of hospital facilities. There is an existing maintenance policy guiding the maintenance work execution, however, the major training found to be given to maintenance operatives are workshops and seminars, which are very inadequate for effective performance especially in a sensitive environment like hospitals. The study also revealed that maintenance operatives are not well motivated and this was attributed to lack of tools/equipment/materials in executing the desired maintenance programmes in hospitals. Others are irregular payment of salaries, delay in promotion. Considering maintenance work execution, the test of the hypothesis revealed that there is no variation in the work performed by the use of in-source and outsourced labour. However, maintenance staff rated the use of in-source better than outsource in that it is found to produce higher quality and better quality control of services, reduction in cost while outsourced gives an understanding of latest technologies with better access to special skills.

Recommendations

In the light of the research findings, and conclusions, the following recommendations are made in order to improve on the practice of maintenance management of our public hospital buildings including services in South West. Nigeria.

- Maintenance staff are to be well motivated in order to deliver their best during the maintenance work execution. Progress report of work done is to be submitted to the management through the head of maintenance department.
- For optimum results, maintenance departments need to adopt sound policies with respect to building elements/services replacement. This will provide appropriate basis for preparing budgets that meet the actual maintenance needs of the hospital buildings and services included. Maintenance managers are to do their best to prepare realistic need-based budgets while the government should make efforts to increase the funding for hospital maintenance.
- Inefficiencies and inflexibility through the imposition of bureaucratic impediments to operational effectiveness should be avoided in hospital environment due to the sensitivity of the services being rendered.
- Maintenance staff and users of hospital buildings should be given opportunities for further training on their jobs also on effective use of hospital facilities. This is necessary to reduce the occurrence of defects, which will consequently bring about better physical and functional hospital building elements and services.
- Maintenance planning based on more realistic assessment of needs and prioritized forward maintenance programme, on a rolling basis should be developed.

References

- Adebayo, S.O. (1991): *A study of the maintenance management of public buildings in Nigeria*. Unpublished Ph.D. thesis, Dept. of Building, University of Lagos, Lagos, Nigeria.
- Arditi, D. (1997): Issues in building maintenance: property managers' perspective. *Journal of Architectural Engineering*, 5(4) 117 – 127.
- Australian Industry Commission (1996): *Quality in Australian health & Care*. Final report, June, 1996.
- Chanter, B. and Swallow, P. (1996): *Building maintenance management*. Blackwell Scientific Oxford, England.
- Chartered Institution of Building (1975): *Maintenance management, Englemere*.
- Gregerson, J. (1994): Opportunity Knocks for Facilities Consultants. *Building Design and Construction*. 35(12), 48 – 52.
- Holland, B.K. (1987): *Managing single family home*. The Institute of Real Estate Management, Chicago. 20(15), 4 – 9.
- Iyagba, R. O. A. (2005): *The menace of sick buildings – a challenge to all for its prevention and treatment*. An Inaugural lecture delivered at University of Lagos, Lagos.
- Lee, R (1997): *Building Maintenance Management*. Blackwell Science Ltd. Oxford, U.K.
- Nous Hospital Consultants (2002): *Generating the master plan for hospitals*. Leading Hospital and Health Care Management Consultants of India pp. 1-3.
- Seeley, I.H. (1987): *Building Maintenance*. Macmillan Press Ltd., London.
- Shohet, I. M. (2003): Building evaluation methodology for setting maintenance priorities in hospital buildings. *Construction management and economics*, 21, 681 – 692. Retrieved on 10 December, 2005 from <http://www.tandf.co.uk/journals>

Appendix

Table 1: Sample frame selected for the study

State	No of Federal owned hospitals	No selected for the study	No of State owned hospitals	No selected for the study	Total No selected for the study	%
Ekiti	1	1	14	5	6	13.0
Osun	1	1	11	4	5	10.9
Ondo	2	2	13	4	6	13.0
Oyo	1	1	21	8	9	19.6
Lagos	4	4	18	5	9	19.6
Ogun	2	2	26	9	11	23.9
Total	11	11	103	35	46	100

Table 2: The survey returns

State	Maintenance staff response			Users		
	Sample size	Number returned	Response rate %	Sample size	Number returned	Response Rate %
Ekiti	30	25	83.3	60	48	80
Osun	25	20	80.0	50	34	68
Ondo	30	24	80.0	60	58	96.7
Oyo	45	40	88.9	90	49	54.4
Lagos	45	45	100.0	90	75	83.3
Ogun	55	52	94.5	110	82	74.5
Total	230	206	89.6	460	346	75.2

Table 3: Analysis of Maintenance staff length of service.

Length of service	Frequency	Valid percent	Cumulative percent
Less than 10 years	109	57.1	57.1
10 – 19 years	59	30.8	87.9
20 – 29 years	20	10.5	98.4
30 and above	3	1.6	100.0
Total	191	100.0	

Source: Field survey (2007).

Table 4: Analysis of Full-time employees in the Maintenance Department.

No of employees	Frequency	Valid percent	Cumulative percent
1 – 10	66	35.7	35.7
11 – 20	89	48.1	83.5
21. – 49	21	11.3	95.1
50 and above	9	4.9	100.00
Total	185	100.0	

Sources: Survey (2007).

Table 5: Analysis of number of buildings the maintenance departments are managing.

Number of buildings	Frequency	Valid percent	Cumulative percent
Fewer than 5 buildings	47	24.7	24.7
6-10 buildings	21	11.1	35.8
11-15 building	39	20.5	56.3
21-30 buildings	40	21.1	84.7
31-40 buildings	10	5.3	90
41-50 buildings	5	2.6	92.6
More than 50	14	7.4	100
Total	190	100.0	

Sources: Field Survey (2007).

Table 6: Analysis of Users Sample by their departments

Department of the Users	Sample Size	% of the population	No Returned	Response %
Medical staff	184	40	184	100
Administrative staff	138	30	100	72.5
Management Staff	46	10	30	65.2
Patients	92	20	30	32.6
Totals	460	100	344	74.8

Source: Survey (2007)

Table 7: Type of Training provided by the Hospital Management for Maintenance staff

Type of training	Frequency	Valid Percent	Cumulative Percent
In-service training	59	29.5	29.5
Workshop/seminar	131	65.5	95.0
Higher Education	10	5.0	100.0
Total	200	100.0	

Source: Survey (2007)

Table 8: Causes of low motivation of maintenance workers.

Demotivating factor	Frequency	Valid percent	Cumulative percent
Lack of working tools/ equipment/materials	38	50.7	50.7
Irregular payment of salaries	12	16.0	66.7
Delayed promotion	8	10.7	77.4
Poor pay	6	8.0	85.4
Lack of opportunities for training/development	6	8.0	93.4
Job insecurity	4	5.3	98.7
Unsafe/unhealthy working condition	1	1.3	100.0
Total	75	100.0	

Source: Survey (2007).

Table 9: Bases for awarding contracts

Basis of award	Frequency	Valid percent	Cumulative percent
Based on priced bill of quantity (B.O.Q)	68	39.8	39.8
Cost reimbursement	64	37.4	77.2
Schedules of rates	39	22.8	100.0
TOTAL	171	100.0	

Source: Field Survey (2007)

Table 10: Analysis of determinants whether a maintenance work may be executed by in-house crew or by outsourcing.

Decision on maintenance work	Frequency	Valid percent	Cumulative percent
The maintenance manager	71	38.6	38.6
The maintenance policy guideline	25	13.6	52.2
The upper management	36	19.6	71.8
The volume of work	28	15.2	87.0
The nature of work	24	13.0	100.0
TOTAL	184	100.0	

Table 11: Correlation analysis of in sourcing and outsourcing:

Efficiency of Maintenance Operations	Outsourcing			Insourcing		
	Mean	M.I.S	Rank	Mean	M.I.S	Rank
Getting the latest technologies	4.03	0.81	1	3.89	0.78	5
Better access to special skills	4.01	0.81	2	3.72	0.74	8
Higher security	3.78	0.76	3	3.89	0.78	5
Specialize expertise	3.77	0.75	4	3.9	0.78	4
Higher quality of service	3.73	0.75	5	4.11	0.82	1
Better adjustment to workload fluctuation	3.64	0.73	6	3.77	0.75	7
Avoiding penalties for delay	3.56	0.71	7	3.67	0.73	11
Minimum equipment downtime	3.51	0.71	8	3.7	0.74	9
Better Control of service	3.42	0.68	9	3.91	0.78	3
Reduced equipment expenditures	3.21	0.64	10	3.69	0.74	10
More flexibility in staffing	3.09	0.62	11	2.73	0.55	12
Reduced Cost	2.72	0.54	12	3.98	0.8	2

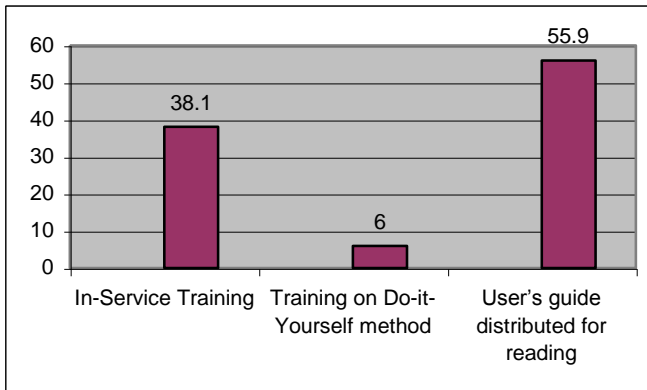


Figure 2: Training type given by the management to the users through Maintenance Department.
Source: Survey (2007)

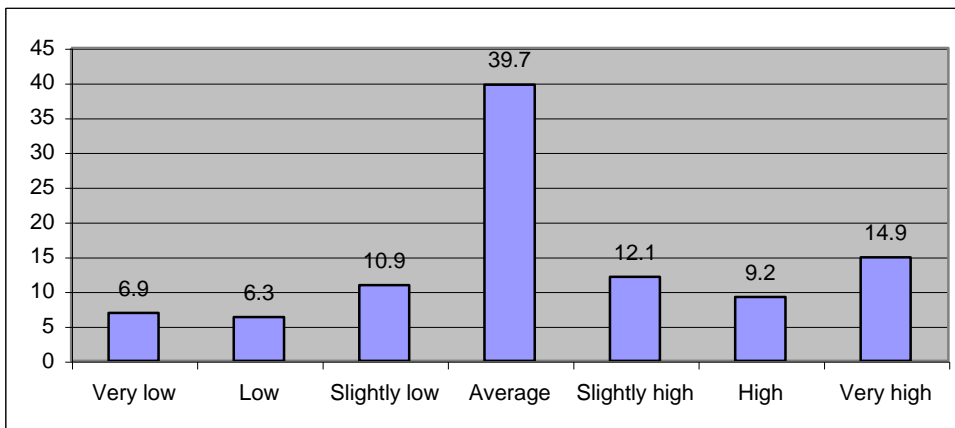


Fig 3: Level of Motivation of Maintenance staff by the management
Source: Survey (2007).

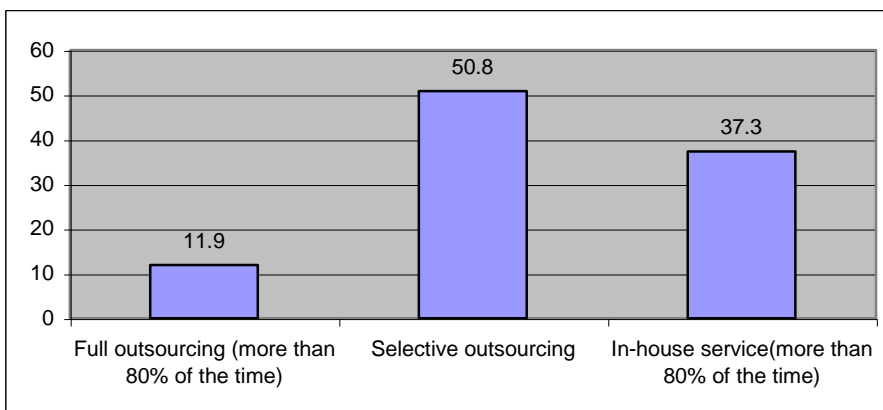


Fig 4: Labour source for the maintenance job execution in public hospitals in southwest, Nigeria
Source: Field Survey (2007)

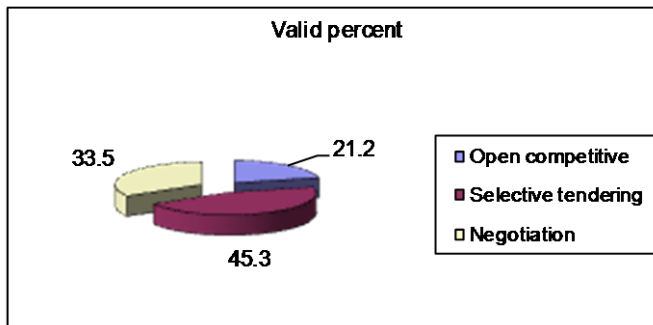


Figure 5: Mode of selection of contractors for maintenance work.
Source: Field Survey (2007)