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Keywords

Performance, audit, case, Indian, unit

Disciplines

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Performance Audit: A Case of Indian R&D Unit

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Abstract

The purpose of this paper is to study the outcome of performance audit of an Indian research and development organisation, NIB and explore the utility of performance audit tools in determining the causes which lead to the failure of this particular organisation. A set of control tools developed by Silaen and Williams (2009) for the study of Research and Development organisation are applied in this case. The elements of the tools developed by Silaen and Williams (2009) consist of dimensions and value of representation. Four dimensions of control tools are given as directional, bureaucratic, scientific and financial. Three values of representation are given as external, internal and social value of representation. A matrix of dimensions and value of representation is developed and applied to the audit report of National Institute of Biologicals (NIB) of the Government of India. It is concluded that the audit findings of Comptroller and Auditor General of India in regard to NIB used all the four control dimensions across the three values of representation and arrived at a suitable recommendation to the Government of India. This study contributes to the literature by examining a unique case of a scientific organisation.

1. Introduction

Performance Audit plays an important role in managing public sector. During the early stage of performance audit in government sector, there were many issues about performance audit such as the scope of this type of audit, qualification of the auditor, and audit criteria. Smith et al (1972) investigated the need and the scope of performance audit, qualification of auditor and audit criteria used in performance audit. Recently, many OECD countries have reformed their public management into New Public Management (NPM) which requires more accountability, and hence need for performance audit (Leeuw, 1996; Politt, 2003).

There are number of studies to investigate the need for performance audit (Leeuw, 1996). The studies focus on the trends and choices of performance audit (Pollitt, 2003), and the development of auditing expertise in government performance (Gendron et al, 2006). The current study uses control tools which are developed by Silaen and Williams (2009) on the case of an Indian R&D unit in government sector to investigate how the performance audit can be applied and what criteria can be used.

In the next section of the paper literature on performance audit is reviewed. This is followed by a review on audit criteria used in performance audit. Then the concept of control tools for R&D organisations is discussed followed by the case of Indian R&D unit. Next an analysis of the case is discussed. Finally conclusions are arrived at based on the analysis.

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2. Performance Audit

The performance audit has different names such as operational audit, functional audit, systems audit, management audit, and audit of management (Smith et al, 1972, p. 270). According to Leeuw, (1996, p. 94), the purpose of performance audit is to audit efficiency and effectiveness of an organisation in which financial audit is unable to tell the complete story (Smith et al, 1972). Performance audit is different from financial audit. It directs attention to the policies and internal procedures which are normally developed, administered and enforced by management (Smith, et al, 1972).

The study of Smith et al (1972) is a survey to investigate the need and scope of the performance audit in early stage. Their study focused on three main questions (Smith et al, 1972, p.272); (1) *the need for an audit of management by CPAs*; (2) *the scope of such an audit*; and (3) *the audit standards required for such an audit*. A group of professionals consisting of CPAs (*Certified Practicing Accountants*), Corporate Controllers, CFAs (*Certified Financial Analysts*), and Mutual Fund Managers were surveyed for the study.

The survey indicated a strong support from CPAs group to agree with the first issue, while others seemed to oppose the performance audit by CPAs on the ground of the nature of the management function and the qualification of CPAs to perform such audit (Smith et al, 1972, p.273). Regarding *the scope of performance audit*, the study focus on the scope of Performance versus Means by providing three substance to audit (a) Management performance only; (b) the means utilized by management; and (c) both performance and means. The survey indicated that none of the respondents support the idea of an audit of performance or means separately (Smith et al, 1972, p.275). The responses from groups other than CPAs were also interpreted to be relevant to lack of CPAs qualification to perform such audit (Smith et al, 1972, p.275). With regard to *the audit standard required for such an audit*, the survey indicated lack of support for the use of Generally Accepted Accounting Principles (GAAP) from the group other than CPAs, which means that a new reporting format need to be developed (Smith et al, 1972, p.281). Their study, at early stage of performance audit indicated a need for performance audit and for the auditor should not be limited to CPA qualification which focused on financial audit only. This view is supported by the result of the second and third question which indicated the scope of the audit to be both performance and means, and lack of support of the use of GAAP.

The performance audit becomes more important in the era of New Public Management (NPM). Roberts and Pollitt (1994) conducted a study to investigate how National Audit Office (NAO) of Wales investigated Value For Money (VFM) of "Creating and Safeguarding Jobs in Wales in 1991 administered by Welsh Office. The VFM is measured by three criteria of Economy, Efficiency and Effectiveness. However, the study indicated a problem in using accounting measure of cost effectiveness by mentioning (Roberts and Pollitt, 1994, p.541),

"Thus cost-effectiveness analysis cannot be used to compare the effectiveness of different programs which are intended to produce the same output, or to compare the effectiveness of a particular programme when applied to different location. The typical measure in cost effectiveness analysis is the net cost of producing one unit of the specified output (for example, per job created, life saved, child taught to read etc)."

The study of Roberts and Pollitt (1994, p.546) finally concluded that, the NAO VFM (National Audit Office- Value For Money) study focused on the area of financial aspect in which the issue of means in terms of management issues were not clearly covered.

Other study conducted by Midwinter (2008) was on Best Value Audit in Scotland. The Best Value regime has statutory duties summarised as follows (Midwinter, 2008, p.440):

- *the duty of Best Value, being to make arrangements to secure continuous improvement in performance (while maintaining an appropriate balance between quality and cost); and in making those arrangements, and securing that balance, to have regard to economy, efficiency and effectiveness, the equal opportunities requirements and to contribute to the achievement of sustainable development;*
- *the duty to achieve breakeven in trading accounts subject to mandatory disclosure;*
- *the duty to observe proper accounting practices;*
- *the duty to make arrangements for the reporting to the public of the outcome of the performance functions.*

The Best Value Audit attempted to use the performance assessment guidance that seemed to integrate planning, budgeting and performance management with regard to proper arrangement for securing economy, efficiency and effectiveness (Midwinter, 2008, p.441). Accordingly, it was mentioned that,

The links between planning, budgeting and performance are not examined systematically in the Best Value Audits. Rather, the benefits in terms of continuous improvement are assumed to flow from sound planning. With few locally driven targets, the Commission's approach to auditing performance relies mainly on The Accounts Commission Statutory Performance Indicator (SPIs), inspector's reports, and residential surveys.

The study of Midwinter (2008) indicated the use of comparison of performance index among councils as the criteria of performance audit.

Since the purpose of performance audit is to measure the management performance, then it is relevant to bring the domain of performance assessment. Wynn-Williams (2005) investigated performance assessment of The Pharmaceutical Management Agency (Pharmac), a government unit under the New Zealand Ministry of Health. The measure of good performance of the agency as mentioned by Wynn-Williams (2005, p.488) is that,

As the sole agency responsible for management of pharmaceuticals within New Zealand, efficiency (maximising output for given inputs) is balanced against effectiveness (best outcomes within society). Outcomes are demand-driven; the public need for pharmaceuticals cannot be controlled. Yet uncontrolled expenditure is unacceptable.

The performance indicator used by Pharmac are focused on cost saving overtime, price of medicine, and comparison performance over time (Wynn-Williams, 2005, pp.488-489).

3. Control Tools

As indicated by Smith et al (1972) that the scopes of performance audit should cover the performance and the management function. Therefore there is a need of different criteria to be used for performance audit from the criteria for financial audit. According to Gay and Simnett (2003, p. 9) auditing is defined as,

...a systematic process of objectively obtaining and evaluating evidence regarding assertions about economic actions and events to ascertain the degree of correspondence between those assertions and established criteria and communicating the results to interested users.

Ouchi (1977, pp. 96-97) defined the management control systems by saying that,

...the control system itself consists primarily of a process for monitoring and evaluating performance, while the preconditions specify the reliability and validity with which such comparisons can be made.

From the two definitions, it can be said that both domains require criteria to which the means and performance are measured. The criteria to measure the means and performance in the domain of management control systems are called as control tool (Silaen and Williams, 2009). Control tools include the concept of Key Performance Indicators (KPI) is found in control literature.

Silaen and Williams (2009) conducted a descriptive study to review the control literature and they proposed a set of control tools that is suitable for research and development (R&D) organisations. They argued that the objective of R&D function is to contribute new knowledge which cannot be set measurable monetarily in advance. Other characteristic of R&D organisation is on its organisational environment that is argued to be relatively uncertain and therefore requires different model of management control systems (Silaen, 2009).

According to Silaen (2009, p. 60) “...control tools refers to instruments that are used in performing the control function.” The core function of the *control tools* is to represent both the value of the desired end (output) and the means or effort. By having those values, the control function will be able to properly monitor, compare and evaluate how far the effort is performed as well as the achievement of the desired ends. The uses of *control tools* may be multiple, and may often be substituted to other uses. Therefore the appropriate control tools chosen may influence the success of the control systems (Silaen, 2009).

Silaen and Williams (2009) propose two elements of the control tools as *dimensions* and *values of representation*. They consider the *dimension* as solid characteristics of the criteria that are used by the control systems. They classified four components of *dimension* of control tools as: *Directional*, *Bureaucratic*, *Scientific* and *Financial* dimensions. The *Directional dimension* is related to qualitative characteristics of the control tools which represent the general directions to be followed by the activity such as system goals, general policy guidelines and strategic plan. The *bureaucratic dimension* of the control tools may be characterised by either quantitative or qualitative characteristics which represent the technical tasks, such as standard operating procedures, quality control, inventory control, and scheduling including PERT, CPM, and production scheduling. As the control tools are to be used for research and development organisation, the control tools need to contain the *scientific dimension* which are used particularly to measure ideas and innovations such as new or improved processes, products or techniques, patents and patent applications, scientific publications, membership of professional organisations and so forth. This dimension may contain either quantitative or qualitative characteristics. Finally, the *financial dimension* of the control tools is the monetary measurement which is commonly used by accounting control such as budgets, cost effectiveness, standard costs and return on investment.

The role of control tools is related to the expected achievement or desired ends and actual performance. Therefore, the control tools should contain *value* that ideally represents these two extreme points. The study of Silaen and Williams (2009) proposed that three values of representation should be available in the control tools: *external values*, *internal values*, and *social values*. According to Silaen and Williams (2009) the *External values* is the value of external party which is considered to be more independent and objective. The market mechanism to define a fair price on the market control (Ouchi, 1979; Lebas & Weigenstein, 1986) or bid price on tender can be considered to contain external values.

At the other end, the *Internal values* refer to values that are developed by an internal party with reference to the internal conditions of the organisation (Silaen and Williams,

2009). Some authorities have given examples of the internal values such as the bureaucratic control (Ouchi, 1979, Lebas & Weigenstein, 1986) that is commonly labelled by setting rules, standard operating procedures and policies, standard costs. The process to setting the internal values may be done by force by dominating party within the organisation such as management team of the organisation, while ordinary employees may need to meet this value. Therefore, the value setting of internal value would have a greater chance for dysfunctional behaviour if it is used in highly uncertain and low goal congruence situation within organisation.

The last value proposed by Silaen and Williams (2009) is *Social value* which refers to value that result from social interaction among the members of a group. The social value may be reflected in the organisational culture. The value setting process of the social values is not done by force as in internal values. Rather, it is accepted by the organisational members willingly. The social values are not affected by clear or unclear boundaries of desired ends, because it is set by the social interactions that have a chance to change and adjust overtime. The social values are accepted through willingness rather than enforcement. The use of social values in the control system will have less chance to drive dysfunctional behaviour than the internal values. According to Silaen and Williams (2009) these three values of representation may be seen as separate. However, in exercising the control tools there would be a combination among these values embodied in the set of control tools applied.

Having defined the dimensions and the value of representation of the control tools, there is now a need to illustrate the operation of these two elements of control tools. The directional dimension of control tools may be set by internal members of the organisation, but the value that is given to this dimension may be a combination of the three values: internal, external and social values. For example, in setting the system goals or general policies guidelines, the members of the organisation would be influenced by internal values regarding the conditions of the organisation. However, the expected conditions would also be influenced by the external environment which contains the external value. Furthermore, the members of the organisation would also be influenced by their individual belief which represents the social values.

In turn, the bureaucratic dimension such as measured by standard operating procedures and scheduling may deal with internal affairs and may be dominated by internal values and social values. The standard operating procedures and scheduling are constructed by the members of the organisation, and these would be based on their past experience and belief. The scientific dimension that is used by R&D organisation may be constructed by a combination of the three values. However, the emphasis of either one of the three values will depend on different stage of R&D operation. In the basic and applied research operations for example, to measure the unmeasurable output such as ideas, thought and concepts, the scientific dimension may be dominated by external and social values to measure the contribution of the research output to knowledge. These may be seen in various aspects such as; patents or patents applications, scientific publications, memorandums, manuscripts, oral presentations, and independent panel and expert rating. The scientific dimension of the control tools that contain social values may include the originality of written work, professional society membership, and creativity ratings. Furthermore, in the product development operation in which the description of expected output is clearer than basic and applied research, the scientific dimension of control tools may be dominated by internal values such as peer or supervisory rating, current organisational status, and also external values such as customers demand on quality of the products.

In turn, the financial dimension of control tools as obvious may be described by internal and or external values. Though the control tools in this category mostly contain internal

values, some of them may also consist of external values such as rate of return, transfer pricing, and budgeting. The success of the control systems may occur when each control element matches the plausible requirement of others.

4. The Case of National Institute of Biological of India

The case used in this study is on the report of Comptroller and Auditor General of India for the year ended March 2008 of a government institute called the National Institute of Biologicals (NIB). The institute was established in January 1992. The expected role of NIB was to act as the national control laboratory to ensure the availability of biological products in good quality for domestic consumption as well as for export. The NIB is under the administrative control of the Ministry of Health and Family Welfare Secretary of India. The institute is headed by a Director and assisted by five deputy directors with the following departments: Quality control and development; Training and technical support; Animal production and quarantine; Environment and personnel safety; and Administration and finance. The cost of establishing the institute had been revised two times and finally come to total of Rs. 2,560 million. The mandate of NIB and related control domain and values is presented in table 1 below.

Table 1: Mandate given to NIB by Government of India

No.	Mandate	Dimension	Values
1.	<p><i>1.1. To undertake systematic examination of the quality of biologicals² and immunobiological³ products,</i></p> <p><i>1.2. with a view to enable the release of indigenous and imported products after certification according to procedures prescribed under the Drugs and Cosmetics Act.</i></p>	<p>Scientific</p> <p>Directional</p>	<p>External</p> <p>Social</p>
2.	<p><i>2.1. To establish National Reference Standards</i></p> <p><i>2.2. and serve as a repository for reference standards and reagents for biologicals and immunobiologicals.</i></p>	<p>Scientific</p> <p>Scientific</p>	<p>External</p> <p>External</p>
3.	<i>3.1. To develop suitable networks/linkages with related institutions set up by the Central or State Governments or within Universities so as to effectively disseminate knowledge, develop manpower</i>	Directional	<p>Internal</p> <p>External</p>

² Biologicals are vaccines, cultures and other preparations made from living organisms and their products, intended for use in diagnosing, immunizing, or treating.

³ Immunobiologicals are antigenic or antibody containing preparation derived from animals or human donors and used for immunization and immune therapy.

	<i>3.2. and act as a resource backup for longterm development of reference standards and quality control of biologicals/immunobiological products</i>	Scientific	1
4.	<i>4.1. To develop and establish pharmacopoeia specifications appropriate for biologicals and immunobiologicals for use in India, in consultation with the Indian Pharmacopoeia Committee</i>	Scientific	External
5.	<i>5.1. To function as an accredited testing and reference laboratory for quality control of biological products available in the future and evaluate and advise on emerging technologies in these fields in terms of their specificity, sensitivity and replicability</i>	Scientific	External
6.	<i>6.1. To provide training to scientific and technical personnel in the procedures for development of standardization and quality control methods of biological</i>	Scientific	External
7.	<i>7.1. To develop technical guidelines/manuals on standards to be used by manufacturers and also for training scientific and technical manpower for standardization and quality control.</i>	Scientific	External
8.	<i>8.1. To monitor ongoing research, establish linkages</i> <i>8.2. and exchange personnel with different institutions in India and abroad for the furtherance of its mandate</i>	Scientific Directional	External Internal

Source: Comptroller and Auditor General of India (2008), page 3

The objective of the performance audit of NIB is to verify five important aspects that are related to the mandate of NIB as presented in table 2 below.

Table 2: Objectives of Performance Audit of NIB

Objectives	Dimension	Values
1.1. <i>the institute fulfilled its role of systematic examination of the quality of indigenous and imported biologicals and immunobiological products and certified their quality;</i>	Scientific	External
1.2. <i>developed reference standards, quality control and testing procedures for them and finalized pharmacopoeia specifications appropriate for biological and immunobiological products;</i>	Directional	Internal
2.1. <i>it contributed to the development of human resources in the field of biological and immunobiological products through networking and linkages with national and international institutes for knowledge sharing and dissemination</i>	Directional	Internal
2.2. <i>and conducted effective training programmes for scientific and technical personnel to address the assessed needs for training with optimum utilisation of its capacity;</i>	Directional	Internal
3.1. <i>the processes, procedures and resources deployed by the institute were commensurate with its mandate</i>	Bureaucratic	Internal
3.2. <i>and were efficiently managed for timely achievement of the intended objectives</i>	Bureaucratic & Directional	Internal
4.1. <i>the procurement process followed by the institute was transparent and ensured economy in purchases and the purchase of equipment and construction of the Laboratory and Animal House and other buildings were as per the specifications and requirements of the institute;</i>	Bureaucratic & Directional	Internal
5.1. <i>the internal controls within the institute and oversight by the Ministry were effective and addressed the shortcomings and deficiencies in time</i>	Bureaucratic	Internal
5.2. <i>and the controls provided assurance against frauds, misuse and waste to ensure economic and efficient use of the inputs for the intended objectives</i>	Financial	Internal

Source: Comptroller and Auditor General of India (2008), page 5

Since the objective of the performance audit is to verify the achievement of NIB in regard with the mandate given, the performance audit examined records, verify physical utilisation of equipment within the period from 2003/2004 to 2007/2008 financial year by using five major audit criteria (Comptroller and Auditor General of India, 2008, p.5) as follows;

Audit Criteria	Dimension	Values
1. <i>the provisions of the Drugs and Cosmetics Act, 1940 and the rules framed thereunder,</i>	<i>Bureaucratic</i>	<i>Internal</i>
2. <i>the mandate of NIB as enshrined in the Memorandum of Association (MOA) and the Expenditure Finance Committee (EFC) Memos (1991,2000),</i>	<i>Bureaucratic Financial</i>	<i>Internal Internal</i>
3. <i>adherence to good laboratory practices (GLP),</i>	<i>Bureaucratic</i>	<i>Internal</i>
4. <i>adherence to drug specifications in the pharmacopoeia, and</i>	<i>Scientific</i>	<i>External</i>
5. <i>the provisions of the Standard Operating Procedure Manual (SOP) of NIB</i>	<i>Bureaucratic</i>	<i>Internal</i>

Although the above five major criteria may be identified in terms of their dimensions and values of representation, the more detail of discussion of how these criteria were used will be presented in the next section

The findings of the performance audit of NIB are summarised into four broad categories (Comptroller and Auditor General of India, 2008, p.7):

1. *Non-achievement of the primary objectives for which NIB was set up*
2. *Lapses in scientific activities*
3. *Lapses in purchases of equipment and their non/underutilization*
4. *Lapses in administrative and internal control*

The audit finding above lead the performance auditors to prepare the recommendation as presented in table 3 below.

Table 3: Recommendation on the Auditor of NIB

<ul style="list-style-type: none"> • <i>NIB should conduct all the crucial tests in accordance with the concerned pharmacopoeia so that the quality of biologicals is ensured before release in the market.</i> • <i>Concerted efforts should be made for development of human resources in the field of biologicals and immunobiological products through proper training of scientific and technical personnel. Besides, efforts should be made for dissemination of knowledge through networking and linkages with national and international institutes.</i> • <i>The Ministry and NIB should ensure deployment of sufficient scientific and technical manpower commensurate with the available infrastructure in NIB in a time-bound manner.</i> • <i>NIB should systematize its procurement procedures and make proper assessment of the actual requirements of equipment before procurement. Besides, concerted efforts should be made to ensure proper utilization of the procured equipment.</i> • <i>The internal controls within the institute and oversight by the Ministry should be strengthened.</i> • <i>The Ministry should fix responsibility for the various lapses observed during audit, such as batch release certification by NIB without conducting the full complement of tests prescribed by the pharmacopoeia; sending of samples by subordinate offices of DCG (I) to NIB for quality control testing despite instructions of the Ministry to the contrary and purchase of a DNA sequencer, an expensive equipment, without any requirement by the institute.</i>

To come to the above recommendation, the auditor has used the control tools to measure the performance which contains aspects in which Silaen and Williams (2009) referred them as to dimensions and value of representations. The next section presents a discussion on the dimensions and value of representation of the audit criteria used by the case.

5. Analysis

The performance audit report of NIB summarised their finding into six criteria and is presented in Table 4.

Table 4: The Findings of the Performance Audit of NIB

	Audit Findings	Dimension	Values of Representation
1	Even after 16 years of its inception and expenditure of Rs. 256 crore, which was 95 <i>per cent</i> of the total project cost, the National Institute of Biologicals (NIB) could not fulfil its role of ensuring availability of safe and good quality biological products for consumption in India. NIB could not achieve its intended objectives of systematic examination of the quality of biologicals, development of national reference standards and human resource development in the field of biologicals. As a result, in spite of the establishment of a vast infrastructure, several batches of biological products continued to be released without independent quality assurance testing. In the case of imports, the country was compelled to rely essentially on claims of safety, potency and efficacy made by foreign manufacturers/ drug regulatory authorities of other countries.	Financial Directional Bureaucratic Scientific	Internal Internal and external Internal External and Social
2	NIB did not deploy Good Laboratory Practices compliant processes and procedures. Serious scientific lapses and malpractices were observed during audit. NIB was certifying blood products stating compliance with requirements of the pharmacopoeia without carrying out critical tests required under the pharmacopoeia. For example, it had certified many batches of immunoglobulin, a lifesaving drug, without carrying out tests to ascertain whether the biological was actually immunoglobulin; whether it was safe for use and would not lead to abnormal toxicity and fever when administered and whether it would remain stable under given temperature conditions.	Bureaucratic Scientific	Internal External and Social
3	Owing to complaints regarding large scale irregularities in testing and reporting of results, the Ministry stopped the testing of biologicals by NIB in July, 2007 and forbade all subordinate offices of the Drug Controller General of India {DCG (I)} to send samples to NIB for testing. Despite this, some subordinate DCG(I) offices continued to send samples to NIB for batch release certification, rendering such testing irregular. Most of the samples received by NIB after July, 2007 were sent by one particular subordinate office of DCG (I) and belonged to one particular manufacturer/company.	Bureaucratic Scientific	Internal External and Social
4	One of the main reasons for underperformance of NIB, in addition to the abovementioned lapses, was non-deployment of commensurate human and physical resources for timely achievement of intended objectives. This, coupled with undue delays in decision making and lack of coordination and proper planning, led to delays in construction of infrastructure and inefficient management and utilization of available resources. Despite the completion of the main Laboratory Building and Animal House in February, 2006, only 75 persons were deployed in NIB as of October, 2008, against the assessed requirement of 363.	Bureaucratic Directional Financial	Internal Internal Internal
5	The procurement process followed by the institute did not ensure sufficient competition and was marred with irregularities. Equipment was procured without proper assessment of actual requirements and cares to stagger purchases in tune with anticipated usage, leading to poor or no utilization of costly equipment. This resulted in wasteful deployment of funds in procurement and unfruitful expenditure on idle maintenance for long spells of time. About 88.5 <i>per cent</i> of the total fixed equipment installed in NIB was lying unutilized. The warranty periods of most of the fixed equipment had lapsed even before they were put to use.	Bureaucratic Financial	Internal values Internal values
6	Only one meeting of the General Body and three meetings of the Governing Body were held against 15 such meetings mandated under the Rules and Regulations of NIB during the five-year period reviewed by Audit. Deficient control and oversight over the performance of NIB deprived the Ministry of opportunities to address NIB's shortcomings and deficiencies in time.	Bureaucratic	Internal values

The performance and accountability of National Institute of Biologicals (NIB) is analysed using the set of control tools developed by Silaen and Williams (2009). In performing this analysis, the audit report of the Comptroller and Auditor General (CAG) of India for the year ended March 2008 along with the information given in the Annual Report of Ministry of Health and Family Welfare, Government of India is used. According to Silaen and Williams (2009) the control tools in the case of an R & D organisation consist of four dimensions- scientific, directional, bureaucratic and financial. Each of these dimensions has three levels of representation – internal, external and social.

5.1 Scientific Dimension

The specific dimension in control tools for performance audit of a R & D organisation is scientific dimension (Silaen and Williams, 2009). The scientific dimension of the accountability of National Institute of Biologicals can be observed from the mandate given to NIB by Government of India, the objective set for audit of NIB by the Comptroller and Auditor General (CAG), the audit criteria set by CAG and the findings of CAG in regard to NIB. From Table 1, it is observed that NIB was mandated to undertake systematic examination of quality of biological and immunological products, establish national reference standards on these products, serve as a repository of reference standards and reagents of biologicals, develop and establish pharmacopoeia specifications appropriate for biologicals, function as an accredited testing and reference laboratory for quality control of biologicals, provide training and scientific personnel in the procedure for development of standardisations and monitor ongoing research in the furtherance of this objective. The objectives set for the audit of National institute of Biologicals by CAG as given in Table 2 reflect the mandate given to NIB by Government of India. The audit findings of CAG, as given in Table 4 suggest that there were considerable lapses in the fulfilment of scientific objectives and mandate set for NIB. The CAG found that “NIB could not achieve its intended objectives of systematic examination of the quality of biologicals, development of reference standards and human resource development in the field of biologicals”. The CAG further observed that NIB was certifying blood products stating compliances with requirements of pharmacopoeia and certified many batches of immunoglobulin without carrying out tests to ascertain whether the biological was in fact immunoglobulin. The audit report of CAG is very critical of the lack of fulfilment of scientific dimension of mandate given to NIB. As given in Table 4, in arriving at their opinion about the performance of NIB, CAG relied on external and social representation of scientific dimension. As NIB could not achieve its objective of systematic examination of biologicals, it resulted in the country’s dependence on claims of safety, potency and efficacy made by foreign manufacturers. Non-fulfilment of the objectives by NIB led to external and social consequences for the Government of India as their dependence on foreign suppliers continued. It was natural for CAG to recommend that NIB should conduct all the crucial tests in accordance with the concerned pharmacopoeia so that quality of biologicals is ensured before their release to the market.

The scientific dimension of the control tool used by CAG was particularly useful in measuring the performance of NIB on their processes, products, techniques and activities. CAG have relied on the social and external representation of the scientific dimension in arriving at their recommendation on the scientific mandate given to NIB by Government of India.

5.2 Directional Dimension

According to Silaen and Williams (2009), the directional dimension of control tools is related to the general directional in the performance of R & D institution to be followed by

activities such as achievement of system goals, general policy guidelines and strategic plan of the R&D institution. The directions of NIB are set in the form of mandate given to them (Table 1). NIB was directed to “develop suitable linkages with related institutions set up by state or central governments and with universities so as to effectively disseminate knowledge and develop manpower. NIB was also directed (as given in table 3) to release indigenous and imported products after certification according to procedures prescribed under Drugs and Cosmetics Act of India. To examine the directional dimension of performance of NIB, CAG investigated to find if the processes, procedures and resources deployed by NIB contributed to the development of human resource in the fields of biologicals and immunological products through appropriate networking and linkages with national and internal institutes for knowledge sharing and dissemination. In doing this the Comptroller and Auditor General (CAG) relied on external and social values of representations. CAG report found that undue delay in decision making (which is an internal value) at NIB, lack of coordination and proper planning led to the non-fulfilment of the mandate set for direction of NIB. NIB could not achieve its intended mandate of human resource development and linkages with central or state government institutions and universities. The non-achievement of NIB in its directional dimension led to CAG recommendation that “concerted effort should be made for the development of human resources in the field of biologicals and immunological products through proper training of scientific and technical personnel. The directional dimension of control tool use by CAG was based on the measurement of internal values of decision making or the lack of it at NIB but resulted in potential consequences for external and social value as due to lack of decision making at NIB appropriate linkages with external stakeholders could not be developed.

5.3 Bureaucratic Dimension

The third dimension in the analysis of control tools of NIB is the bureaucratic dimension. According to Silaen and Williams (2009) the bureaucratic dimension of control tools may be characterised by either quantitative or qualitative characteristics which represent technical tasks such as standard operating procedures, quality control, inventory control and scheduling. These tasks are based on internal actions by the organisation and hence have internal value of representation. The standard operating procedures and scheduling are constructed by the members of organisation (internal to the organisation) and may be based on past experience and belief. The bureaucratic dimension of control tools of NIB were observed by CAG in setting their audit objectives to investigate if “the processes, procedures and resources deployed by NIB were commensurate with their mandate and were efficiently managed for timely achievement of their intended objectives.” The CAG also audited to find if the procurement procedures followed by the institute was transparent and ensured the economy in purchases of equipment and construction of facilities. Further CAG also investigated the internal controls of NIB to find out if the oversight of the Ministry of Health and family Welfare, Government of India was effective and addressed any shortcomings in working of NIB.

The Comptroller and Auditor General (CAG) observed that NIB did not deploy Good Laboratory Practice compliant processes and procedures. Serious scientific lapses and malpractices were observed in the working of NIB by CAG during audit. Owing to these complaints, the Ministry at one stage stopped testing of biological by NIB in 2007 and forbade offices of Drug Controller General of India (DGCI) to send drug samples to NIB for testing. Despite a clear direction by the Ministry not to send samples to NIB, one office of DGCI did send samples to NIB for testing. A lack of bureaucratic control is evident here. Although this lack of bureaucratic control is internal to NIB, there are potential external

consequences as outside parties are involved with NIB. Further CAG report mentions that undue delay in decision making at NIB led to delays in construction of infrastructure and inefficient management and utilisation of available resources. The procurement process followed by NIB did not ensure sufficient competition and was marred by irregularities. The lack of bureaucratic control is further evidenced by the fact that only one meeting of general body and three meetings of the governing body of NIB were held against fifteen such meetings mandated under the rules and regulations of NIB. Lack of bureaucratic control and oversight over the performance of NIB deprived the Ministry of opportunity to address NIB's shortcomings and deficiencies. CAG's examination of bureaucratic dimension of control tool of NIB had mostly internal value of representation as internal procedures, processes and guidelines were examined to understand the shortcomings and lack of control in the working of NIB.

5.4 Financial Dimension

Financial dimension is the last dimension in the use of control tools. Financial dimension of control tools provides the monetary measurements of an organisation's performance. Financial dimension uses accounting tools such as budgets, cost effectiveness, standard costs and return on investments as mechanisms of evaluation. In the performance audit of NIB, CAG focused on the controls provided against frauds, misuse and waste to ensure economic and efficient use of inputs for intended objectives by NIB. NIB was established by Government of India at a cost of Rs2560 million. According to CAG report (Table 4), in spite of this expenditure, National Institute of Biologicals could not fulfil its role of ensuring availability of safe and good quality biological products for consumption in India. The laboratory buildings of NIB were completed in 2006, but only 75 persons were employed by NIB against the assessed requirement of 363. About 88.5% of total fixed equipment installed in NIB was underutilised. The warranty period of most of the fixed equipment lapsed even before the equipment was put to use. CAG in their report recommended that NIB should systematize its procurement procedures and make proper assessment of actual equipment before procurement. Effort should be made to ensure utilisation of the procured equipment. The financial dimension of control tools examined by CAG led to the conclusion that NIB needed to address the lapses in the procurement and their underutilisation/non-utilisation. The financial dimension in this case is based on the internal value of representation as all the aspects are related to the internal working of NIB.

From the above discussion it is clear that CAG has effectively used four dimensions of control tools- scientific, directional, bureaucratic and financial – to assess the performance and public accountability of National Institute of Biologicals (NIB). Through its performance audit report, CAG has examined various aspects of performance of NIB keeping in view its mandate and made recommendations which would help NIB to improve its accountability. In the discussion above, each of the four dimensions were used independent of each other in explaining the use of control tools for the performance audit of NIB. Many times these dimensions are linked to each other. The first finding of CAG consists of financial dimension that measures the expenditure dispensed by NIB and was linked to directional and bureaucratic dimensions indicated by the mandated functions of NIB to control the quality of biological. Table 4 summarises the findings of CAG on the performance of NIB. Each of the findings mentioned in table 4 include more than one dimension except finding no 6. For example, finding 1 includes all the four dimensions – scientific, directional, bureaucratic and financial. Similarly each of the findings is based on internal, external or social values of

representation. Since the performance of NIB has implications for internal values of NIB, on organisations external to NIB and on the public accountability of scientific services to larger community, the CAG report appropriately bases its recommendations on all the four dimensions and three values of representations.

6. Conclusion

This study examined the application of the component of control tools developed by Silaen and Williams (2009) to the performance audit of NIB, a public sector Research and Development organisation in India. The control tools contain two elements; dimensions and values of representation. The dimension of the control tools consists of four components; directional, bureaucratic, scientific and financial dimension. The values of representation of the control tools contains three values; internal, external and social value. The mandate of NIB is based on scientific and directional dimensions as given in Table 1. However in order to evaluate the performance of NIB, CAG has used all the four dimensions and three values of representation as given in Table 2. The findings of CAG are also based on four dimensions and three values of representations. This progression of use of dimensions during the audit process suggests that for proper performance audit interplay of dimensions and values of representations leads to better results in performance audit.

The study contributes to the literature by highlighting the use of control dimension and values of representation by applying these concepts to a case study on the performance of a scientific organisation in public sector. The study is however, limited to a single case study of NIB, a government unit of India using audit report as a source of data. Further study in a different cultural and contextual setting is needed to enrich the collection of case studies on the criteria used by performance audit in public sector and to understand the varied use of control tools in performance audit.

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