Measurement of Performance n University Libraries in Tamil Nadu: A Study on Certain Areas of Library Functions

N. Thenmozhi
Research Scholar
Bharathiar University
Coimbatore
Email: aghoushick_2002@yahoo.co.in

S. Gopalakrishnan
Head, Resource Centre
National Institute of Fashion Technology
Old Mahabalipuram Road, Chennai
Email: gopusg@yahoo.com

Abstract

The performance indicators that areneeded and how they are used can be viewed from anumber of perspectives. The data were obtained from49 universities in Tamil Nadu. These universitieswere categorized. Out of 49 universities, 19(38.8%)belongs to state universities, 27(55.1%) Deemeduniversities and 3 (6.1%) Central Universities.The library services are measured based on 15 variables. Application factor analysis felicitated and 4 components were named as "Collection", "Dissemination", "User" and "Technology". The variables under each component were further analysed using reliability test, mean and standard deviation to identify the critical variables to enhance the performance of the library services in the University libraries of Tamilnadu.

Keywords

Performance Measurement, Universities, Tamil Nadu
.

Electronic access

The journal is available at www.jalis.in
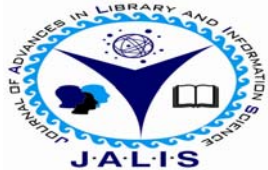
INTRODUCTION

Performance measurement is the process of regularly measuring the outputs and outcomes produced by the organization. Performance measurement is a useful tool for managing services. It allows to track the progress of the services/activities towards largest goals and to identify its strengths and possible areas for improvement. All the stakeholders – staff and users, should be actively involved in performance measurement activities to track outputs and outcomes. Ultimately, performance measurement information will ensure accountability, and will help to improve services and client outcome.

The performance measures will be useful
- to monitor internally library performance
- to compare actual performance with planned performance and
- to compare the performance of one library with that of other libraries

Libraries have been able to demonstrate their importance to their parent organization by reciting statistics focused on inputs (resource investments) and outputs (services produced). In the digital environment the librarian need to plan for additional services which can be implemented and support to the users. Performance indicators are to analyze data in order to clarify the output and outcome of the Library services and see how best the library is performing. The quest for quality, accountability and justification of service is demanding increasing attention around the world, both in those countries which arc deprived of resources and in those which are relatively rich and could be described as having a sophisticated information and technology base. Within this economic climate, during the rest of the century and into the next, Library and information professionals will face considerable challenges both in meeting and satisfying the requirements of individual institutions and states.

WHAT IS PERFORMANCE MEASURE

The Lynch (1997) defines that the performance measure is the results of measurement can be used to evaluate the performance of a library, and thereby determine whether or not it is effective. According to Boekhorst (1995) "Performance measurement is comparing what a library is doing (performance), with what it is meant to do (mission), and wants to achieve (goals). The extent to which goals are reached can be determined by using performance

indicators". "Performance measurement involves the evaluation of an activity, programme, or service in relation to its appropriateness, effectiveness, and efficiency. Performance indicators are developed to measure these criteria."(Schmidt, 1990). International Standards Organisation, 1996, (ISO) listed the following 29 Indicators for traditional services have to meet the Criteria of being already tested, in common use, and applicable to almost any type of Library.

- User satisfaction;
- General (4 indicators on use/cost);
- Providing documents (6 indicators on availability/use);
- Retrieving documents (2 indicators on retrieval times);
- Lending documents (and document delivery) (6 indicators on use/cost);
- Enquiry & reference services (I indicator on 'correct answer' fill rate);
- Information searching (2 indicators on cataloguing searching success);
- Facilities (4 indicators on availability/use);
- Acquiring and processing documents (2 indicators on median times); and
- Cataloguing (I indicator on cost per title).

Lancaster (1988) has mentioned the following purposes of evaluation:
1. To establish a type of 'benchmark' to show the level of performance at which the service is now operating;
2. To compare the performance of several libraries or services;
3. To justify existence of library services;
4. To identify possible sources of failure or inefficiency in the service with a view to rating the level of performance at some future date.

Thus comparing what a library is doing (performance) with what it is meant to do (mission)and wants to achieve (goals). Performance is the degree to which a library is achieving its objectives, particularly in terms of users' needs.

NEED FOR THE STUDY

Academic libraries must also be able to demonstrate the value of what they are doing and provide evidence of the impact that they are making, so that it is important to use methods to find assessment data. Librarians must manage staff, information in several supports, and technical activities to produce quality

services. Quality services mean resources and services that satisfy the user's expectations.

The performance measures will be useful
- to monitor internally library performance
- to compare actual performance with planned performance and
- to compare the performance of one library with that of other libraries

REVIEW OF RELATED LITERATURE

Performance measurement of library and information organizations is an important managerial activity. This activity is defined as "the process of systematically assessing effectiveness against a predetermined norm, standard or expressed goal" (Cronin, 1982). In other words, performance measurement is the comparison of actual levels of performance with pre-established target levels of performance (Slizyte&Bakanauskiene, 2007). The roles of performance measurement are widely recognized as: supporting the management process (Nuut, Lepik&Liivamagi, 2002); demonstrating institutional effectiveness and accountability (Baker, 2002); tracking quality achievements of an institution (Baba &Shukor, 2003); supporting decision making and improving library and information services and comparing different sources of data and planning strategy(Booth, 2006).

Alston (1995) has described practical set of performance indicators for evaluating the Libraries. Author has explained
- What the set was intended to achieve;
- how the indicators were chosen and
- What the selection criteria,

The author further emphasized that the main values of the indicators are as a practical management tool, as a means of pre-empting problems, and as a platform for further informed questions.Van-House and Childers (1990): describes the Public Library Effectiveness Study (PLES), which was designed to apply models and methods of organizational effectiveness research to public Libraries. Indicator of public Library effectiveness arc described, factor analysis results are presented, implications for evaluating Library performance are discussed, and further research is suggested.Williams and Waliters (2003) focuses on the concept of experience- based Library service. Mention of the Library service that links its effectiveness to how patrons rate their visit, brings staff onto the floor to maximize the personal

touch, promotes a multi-sensory learning environment, and never marginalizes the importance of hooks in the Library mission.

OBJECTIVES

The major objectives of the study are:

- To survey the University Libraries in Tamil Nadu with respect to collection, resources and ICT facilities.
- To elicit Librarian's opinion on the enhancement of services with of ICT application.
- To examine the role of Library and Library staff in performance measure.
- To examine the organization of continues performance evaluation programme by the universities.
- To measure the efforts of libraries in the context of standards.

HYPOTHESES

In order to test the stated objectives, following hypotheses are framed.

- There exists interest among the University librarians in Tamilnadu for having Performance measurements.
- There exists continuous Performance Evaluation Programme in university libraries in Tamilnadu.
- The Library professionals are having fair knowledge on emerging trends in the library profession.
- Performance measurement in the library is

integrated in its planning and review procedures.

There exists willingness to adopt the performance measurement in the context of international standards

DATA ANALYSIS

The data were obtained from 49 universities in Tamil Nadu. These universities were categorized viz. State, Deemed and Central Universities and the same is shown in Table 1

Table 1: Type of University

S.No	Description	No. of Respondents	%
1	State	19	(38.8)
2	Deemed	27	(55.1)
3	Central	3	(6.1)
		49	100.00)

Nearly (38.8%) were belongs to state university. It is followed by Deemed Universities (55.1%) and Central Universities (6.1%)

SERVICES

The Performance Evaluation strategy has been ascertained on "Services" based on 15 variables on a three point scale such as "not at all necessary", "periodically" and "continuously" which is in Table 2. The Mean and Standard Deviation are calculated based on the opinion of the respondents. The ranks were assigned based on mean and standard deviation.

Table 2: Performance Measurement on Services

S.No	Description	Not at all Necessary		Periodically		Continuously		Mean	Std	Rank
1	Reference collection	11	22.4%	11	22.4%	27	55.1%	2.33	0.83	5
2	Digital Library	9	18.4%	11	22.4%	29	59.2%	2.41	0.79	3
3	Cultural Heritage collection	25	51.0%	18	36.7%	6	12.2%	1.61	0.70	15
4	Functioning as Bibliographic Centre	14	28.6%	25	51.0%	10	20.4%	1.92	0.70	12
5	Bibliography	17	34.7%	22	44.9%	10	20.4%	1.86	0.74	14
6	Index Compilation	17	34.7%	21	42.9%	11	22.4%	1.88	0.75	13
7	Bibliographic database Developing	10	20.4%	15	30.6%	24	49.0%	2.29	0.79	6
8	Service Planning	11	22.4%	13	26.5%	25	51.0%	2.29	0.82	7
9	Development of Libraries and Librarianship	11	22.4%	9	18.4%	29	59.2%	2.37	0.83	4
10	Preparing Library standards	15	30.6%	11	22.4%	23	46.9%	2.16	0.87	9

11	Making Library studies	14	28.6%	21	42.9%	14	28.6%	2.00	0.76	10
12	Acting as National Information Centre	8	16.3%	22	44.9%	19	38.8%	2.22	0.71	8
13	Leadership among Libraries	16	32.7%	17	34.7%	16	32.7%	2.00	0.82	11
14	Developments in Information Technology	3	6.1%	20	40.8%	26	53.1%	2.47	0.62	2
15	Reading and information literacy promotion	3	6.1%	16	32.7%	30	61.2%	2.55	0.61	1

The mean value ranges between 1.61 and 2.55. The mean value of the variable shows that all the variables are lies between "periodically" and "continuously". The standard deviation also ranges between 0.61 and 0.83 which indicates that there is no significant deviation in the opinions.

The analysis for services further extended to the factor analysis. The factor analysis provided four components on 15 variables. The components, factor value and the variables are shown in Table 3.

Table 3: Factor Analysis of Services

S.No	Services	Component			
		1	2	3	4
1	Reference collection	.812	.102	.175	.021
2	Digital Library	.554	.517	.184	.271
3	Development of Libraries and Librarianship	.832	-.096	.406	-.061
4	Making Library studies	.794	.252	-.230	.030
5	Cultural Heritage collection	.430	.709	-.092	-.205
6	Functioning as Bibliographic Centre	.169	.882	-.196	.006
7	Bibliography	.026	.958	-.070	-.045
8	Index Compilation	-.299	.759	-.172	.426
9	Service Planning	.513	-.184	.722	.053
10	Preparing Library standards	.056	.105	.864	.149
11	Acting as National Information Centre	.274	-.198	.873	.121
12	Leadership among Libraries	.037	-.043	.938	.072
13	Bibliographic database Developing	.018	.445	-.186	.779
14	Developments in Information Technology	.138	-.176	.561	.740
15	Reading and information literacy promotion	.192	-.255	.523	.755

It is seen from Table 3 that the four components evolved and these components were named based on the variables. The component names are: "Collection", "Dissemination", "Quality" and "Technology".

RELIABILITY ANALYSIS FOR COMPONENTS.

Reliability is concerned with the consistency of a variable. There are two identifiable aspects of this issue: external and internal reliability. Nowadays, the most common method of estimating internal reliability is Cronbach's alpha (α), which is roughly equivalent to the average of all possible split-half reliability coefficients for a scale (Zeller and Carmines, 1980). The usual formula is

$$\alpha = \frac{K}{K-1}\left(1 - \frac{\sum_{i=1}^{K}\sigma_{Y_i}^2}{\sigma_X^2}\right)$$

Where K is the number of items number of items; $\sum \sigma_i^2$ is the sum of the total variances of the items; and σ_x^2 is the variance of the total score (Pedhazur and Schmelkin, 1991). If alpha comes out below 0.8,

the reliability of the scale may need to be investigated further.

Several investigators have shown that alpha can take on quite high values even when the set of items measures several unrelated latent constructs (e.g., Cortina, 1993; Cronbach, 1951; Green, Lissitz and Mulaik, 1977; Revelle, 1979; Schmitt, 1996; Zinbarg et al. 2006). As a result, alpha is most appropriately used when the items measure different substantive areas within a single construct. When the set of items measures more than one construct, coefficient omega_hierarchical is more appropriate (McDonald, 1999; Zinbarg et al. 2005).

A commonly accepted rules for describing internal consistency using Cronbach's alpha (Cronbach, Lee J., and Shavelson R J, 2004) are $\alpha \geq 0.9$ (Excellent), $0.9 > \alpha \geq 0.8$ (Good), $0.8 > \alpha \geq 0.7$ (Acceptable), $0.7 > \alpha \geq 0.6$ (Questionable), $0.6 > \alpha \geq 0.5$ (Poor) and $0.5 > \alpha$ (Unacceptable).Reliability test has been administrated for these four components. The Cronbachvalue for thesecomponents were shown in Table 4.

Table 4: Reliability Test for Components

S.No	Component	No. of Variables	Cronbach value
1	Collection	4	0.8209
2	Dissemination	4	0.8702
3	Quality	4	0.7891
4	Technology	3	0.7129

The reliability value of the Components "Dissemination" and "Collection" which indicates that these two components are "Good". The other two components value lies between $0.8 > \alpha \geq 0.7$ which are of "Acceptable".

COLLECTION

The analysis is further extended for the variables in individual components. Table 5 shows the ranking of variables in the component "Collection". The variables are ranked based on the mean value.

Table 5: Performance Measurement on Services of the Component Collection

Sl. No.	Variables	Not at all Necessary		Periodically		Continuously		Mean	Std	Rank
1	Reference collection	11	22.4%	11	22.4%	27	55.1%	2.3265	.82633	3
2	Digital Library	9	18.4%	11	22.4%	29	59.2%	2.4082	.78842	1
3	Development of Libraries and Librarianship	11	22.4%	9	18.4%	29	59.2%	2.3673	.83401	2
4	Making Library studies	14	28.6%	21	42.9%	14	28.6%	2.0000	.76376	4

It is seen that the mean value ranges between 2.00 to 2.40 which indicates that variables needs continuous performance evaluation.

Table 6: Performance Measurement of Collection Component Vs type of University

Type of University	Variables	Not at all Necessary		Periodically		Continuously		Mean	Std	Rank
State	Reference collection	2	10.5%	4	21.1%	13	68.4%	2.5789	.69248	1
	Digital Library	2	10.5%	4	21.1%	13	68.4%	2.5789	.69248	1
	Development of Libraries and Librarianship	3	15.8%	4	21.1%	12	63.2%	2.4737	.77233	3
	Making Library studies	3	15.8%	8	42.1%	8	42.1%	2.2632	.73349	4
Deemed	Reference collection	9	33.3%	7	25.9%	11	40.7%	2.0741	.87380	3
	Digital Library	6	22.2%	7	25.9%	14	51.9%	2.2963	.82345	1

	Development of Libraries and Librarianship	7	25.9%	5	18.5%	15	55.6%	2.2963	.86890	2
	Making Library studies	11	40.7%	11	40.7%	5	18.5%	1.7778	.75107	4
Central	Reference collection	0	.0%	0	.0%	3	100.0%	3.0000	.00000	1
	Digital Library	1	33.3%	0	.0%	2	66.7%	2.3333	1.15470	2
	Development of Libraries and Librarianship	1	33.3%	0	.0%	2	66.7%	2.3333	1.15470	2
	Making Library studies	0	.0%	2	66.7%	1	33.3%	2.3333	.57735	4

The continuous performance evaluations are expected in the case of Digital Libraries irrespective of the type of universities where in the state and central universities are giving preference to reference collection. The deemed universities in Tamilnadu are giving due importance to the development of librarianship. The ranking of the preference of the type of universities are shown in Table 6 for the component "Collection".

DISSEMINATION

The ranking based on the mean value for the component "Dissemination" is shown in Table 7 where in the mean value is between 1.61 and 1.91. The results of the component "Dissemination" shows that the respondents are in the opinion that the performance evaluation needs periodically.

Table 7: Performance Measurement on Services of the Component Dissemination

S.No	Variables	Not at all Necessary		Periodically		Continuously		Mean	Std	Rank
1	Cultural Heritage collection	25	51.0%	18	36.7%	6	12.2%	1.6122	.70167	4
2	Functioning as Bibliographic Centre	14	28.6%	25	51.0%	10	20.4%	1.9184	.70228	1
3	Bibliography	17	34.7%	22	44.9%	10	20.4%	1.8571	.73598	3
4	Index Compilation	17	34.7%	21	42.9%	11	22.4%	1.8776	.75368	2

Table 8: Performance Measurement of Dissemination Component Vs Type of University

Type of university	Variables	Not at all Necessary		Periodically		Continuously		Mean	Std	Rank
State	Cultural Heritage collection	7	36.8%	10	52.6%	2	10.5%	1.7368	.65338	4
	Functioning as Bibliographic Centre	3	15.8%	11	57.9%	5	26.3%	2.1053	.65784	1
	Bibliography	5	26.3%	8	42.1%	6	31.6%	2.0526	.77986	2
	Index Compilation	6	31.6%	9	47.4%	4	21.1%	1.8947	.73747	3
Deemed	Cultural Heritage collection	16	59.3%	7	25.9%	4	14.8%	1.5556	.75107	4
	Functioning as Bibliographic Centre	10	37.0%	13	48.1%	4	14.8%	1.7778	.69798	2
	Bibliography	11	40.7%	13	48.1%	3	11.1%	1.7037	.66880	3
	Index Compilation	11	40.7%	9	33.3%	7	25.9%	1.8519	.81824	1
Central	Cultural Heritage collection	2	66.7%	1	33.3%	0	.0%	1.3333	.57735	4
	Functioning as Bibliographic Centre	1	33.3%	1	33.3%	1	33.3%	2.0000	1.00000	2

Bibliography	1	33.3%	1	33.3%	1	33.3%	2.0000	1.00000	2
Index Compilation	0	.0%	3	100.0%	0	.0%	2.0000	.00000	1

It is seen from the table 8 that the periodical performance are expected for the variables "index compilation" in central and deemed university libraries whereas 57.9% of the respondents are giving top preference to "functioning as bibliographic centre". Least preference is given for the cultural heritage collection in central, state and deemed university libraries.

QUALITY

The variables in the "Quality" component are ranked based on the mean value. The respondents are of the opinion that the quality aspect of the libraries in the universities needs continuous evaluation. The mean and standard deviation value are shown in table 9.

Table 9: Performance Measurement on Services of the Component Quality

S.No	Variables	Not at all Necessary		Periodically		Continuously		Mean	Std	Rank
1	Service Planning	11	22.4%	13	26.5%	25	51.0%	2.2857	.81650	1
2	Preparing Library standards	15	30.6%	11	22.4%	23	46.9%	2.1633	.87433	3
3	Acting as National Information Centre	8	16.3%	22	44.9%	19	38.8%	2.2245	.71488	2
4	Leadership among Libraries	16	32.7%	17	34.7%	16	32.7%	2.0000	.81650	4

Table 10: Performance Measurement of Quality Component Vs Type of University

Type of university	Variables	Not at all Necessary		Periodically		Continuously		Mean	Std	Rank
State	Service Planning	2	10.5%	6	31.6%	11	57.9%	2.4737	.69669	1
	Preparing Library standards	4	21.1%	5	26.3%	10	52.6%	2.3158	.82007	2
	Acting as National Information Centre	3	15.8%	8	42.1%	8	42.1%	2.2632	.73349	3
	Leadership among Libraries	7	36.8%	6	31.6%	6	31.6%	1.9474	.84811	4
Deemed	Service Planning	9	33.3%	6	22.2%	12	44.4%	2.1111	.89156	2
	Preparing Library standards	10	37.0%	6	22.2%	11	40.7%	2.0370	.89792	3
	Acting as National Information Centre	5	18.5%	13	48.1%	9	33.3%	2.1481	.71810	1
	Leadership among Libraries	8	29.6%	11	40.7%	8	29.6%	2.0000	.78446	4
Central	Service Planning	0	.0%	1	33.3%	2	66.7%	2.6667	.57735	1
	Preparing Library standards	1	33.3%	0	.0%	2	66.7%	2.3333	1.15470	3
	Acting as National Information Centre	0	.0%	1	33.3%	2	66.7%	2.6667	.57735	1
	Leadership among Libraries	1	33.3%	0	.0%	2	66.7%	2.3333	1.15470	3

It is observed from table 10 that the state and central university libraries need continuous performance evaluation in respect of "service planning" where in the deemed and central university gives preference for performance evaluation to make the university library as "national information centre". It is interesting to note that the central university libraries are giving more importance for continuous evaluation to both "service planning" and "acting as national information centre'.

TECHNOLOGY

Based on the factor analysis, the component "Technology' has three variables in which the mean value is between 2.28 and 2.55. (Table 11)

Table 11:Performance Measurement on Services of the component Technology

S.No	Variables	Not at all Necessary		Periodically		Continuously		Mean	Std	Rank
1	Bibliographic database Developing	10	20.4%	15	30.6%	24	49.0%	2.2857	.79057	3
2	Developments in Information Technology	3	6.1%	20	40.8%	26	53.1%	2.4694	.61583	2
3	Reading and information literacy promotion	3	6.1%	16	32.7%	30	61.2%	2.5510	.61445	1

Table 11 shows that the variable "reading and information literacy promotion" ranks first based on the mean value. Almost half or little more of the respondents are in the opinion that the component "technology" needs continuous performance evaluation.

Table 12: Performance Measurement of Technology Component Vs Type of University

Type of university	Variables	Not at all Necessary		Periodically		Continuously		Mean	Std	Rank
State	Bibliographic database Developing	4	21.1%	6	31.6%	9	47.4%	2.2632	.80568	3
	Developments in Information Technology	1	5.3%	8	42.1%	10	52.6%	2.4737	.61178	2
	Reading and information literacy promotion	1	5.3%	7	36.8%	11	57.9%	2.5263	.61178	1
Deemed	Bibliographic database Developing	6	22.2%	6	22.2%	15	55.6%	2.3333	.83205	3
	Developments in Information Technology	2	7.4%	10	37.0%	15	55.6%	2.4815	.64273	2
	Reading and information literacy promotion	2	7.4%	7	25.9%	18	66.7%	2.5926	.63605	1
Central	Bibliographic database Developing	0	.0%	3	100.0%	0	.0%	2.0000	.00000	3
	Developments in Information Technology	0	.0%	2	66.7%	1	33.3%	2.3333	.57735	1
	Reading and information literacy promotion	0	.0%	2	66.7%	1	33.3%	2.3333	.57735	1

It is seen from table 12 that the 'technology" component needs continuous performance evaluation in respect of state and deemed universities whereas the central university libraries are of the opinion that their university libraries only needs periodical performance evaluation. In overall, all type of

libraries are giving top importance to the performance evaluation in respect of 'reading and information literacy promotion.

CONCLUSION

The study is based on the analysis of the data received through questionnaire with the help of the Tables, Graphs and Q-analysis. The findings reveal that the performance measurement standards are gaining importance among the libraries.

Today, many libraries are actively involved in the implementation of quality frameworks and are utilizing quality management tools such as Benchmarking, Performance measurements, etc. The activities in the field of library always lead to a statement of objectives of the parent institute and the library's annual planning cycle. This planning cycle needs to be monitored in relation to achievement. The performance indicators provide the means.

REFERENCES

1. Alston, Ruth (1995). Performance indicators in Bromley--purpose and practice.LibraryManagement. , 16, (1), 18-28.

2. Baba, Dato' Zawiyah and Shukor, Rosham Abdul (2003). Performance indicators for nationallibraries in Asia/Oceania: preliminary proposals based on a survey of Asia/Oceania libraries.Retrieved March 01, 2007 from ifla.queenslibrary.org/IV/ifla69/papers/025e-Baba_Shukor.Pdf

3. Boekhorst, Peter (1995). Measuring quality: the IFLA guidelines for performance measurement in academic libraries.*IFLA Journal,* 21, (4), 278-281.

4. Booth, A., (2006), "Counting what counts: Performance measurement and evidence-based practice". *Performance Measurement and Metrics,* Vol.7 No.2**,** pp. 63-74.

5. Cortina. J. M(1993). What is coefficient alpha? An examination of theory and applications.Journal of Applied Psychology, 78, 98- 104.

6. Cronbach, L. J(1951). Coefficient alpha and the internal structure of tests .*Psychometrika,* 16(3), 297-334.

7. Cronbach, Lee, J and Shavelson, R J(2004). My Current Thoughts on Coefficient Alpha and Successor Procedures.Educational and Psychological Measurement 64(3), 391-418.

8. Cronin, B. (1982). Taking the measure of service.*Aslib Proceedings* 34(6/7): 273–94.

9. Green, S. B., Lissitz, R.W. and Mulaik, S. A (1977).Limitations of coefficient alpha as an index of test unidimensionality.Educational and Psychological Measurement, 37, 827-838.

10. Lancaster, F.W. (1988). If You Want to Evaluate your Library… London: The Library Association, 6-7.

11. Lynch, Beverly P. (1997). Research as a Basis of the Development of Standards for Libraries, *IFLA Journal*, 23(2), 124.

12. McDonald, R. P. (1999). Test Theory: A Unified Treatment, Erlbaum, pp. 90–103.

13. Nuut, Anu.,Lepik, Aira., and Liivamägi, Toomas (2002). Developing Performance Measurement and Quality Evaluation in Estonian Research Libraries. In. Proceedings of the 4th Northumbria International Conference on Performance Measurement in Libraries andInformation Services: Meaningful Measures for Emerging Realities. IFLA satellite preconference, 12-16. August, 2001,Pittsurgh, Pennsylvania, USA. p.159-171

14. Pedhazur, E.J. and Schmelkin, I.P (1991). Measurement, Design and Analysis: An Integrated Approach. Hillsdale, NJ: Lawrence Erlbaum Associates.

15. Revelle, W (1979).Hierarchical cluster analysis and the internal structure of tests. Multivariate Behavioral Research, 14, 57-74.

16. Schmidt, Janine (1990). Practical experience of performance measurement at the State Library of New South Wales.*Australian academic & research libraries*. 21(2), 65-77.

17. Schmitt, N. (1996). Uses and abuses of coefficient alpha.Psychological Assessment, 8, 350-353.

18. Slizyte, A. and Bakanauskiene, I.,(2007), "Designing performance measurement system in organization". *rganizacijøVadyba: SisteminiaiTyrimai,* Vol.43, pp.135-149.