

The Use of Performance Measurement Tools and Techniques
by State Agencies

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To be presented at the
2001 Annual Meeting
Association for Budgeting & Financial Management
January, 2002

Most studies of the use of performance budgeting and management by the states occur at the level of the central budget office or on the legislative side. Some of these studies have suggested that while the techniques of performance budgeting may not take place throughout the state certain agencies or policy areas may use them more than others. The purpose of this research is to study performance budgeting in state agencies in order to determine which performance measurement techniques are used at the agency level. Using survey data the study characterizes the usage patterns and addresses what social, political and organizational (capacity and culture) factors are related to performance measurement usage.

If you were to ask the average citizen, elected official or government worker for an explanation of the terms “performance budgeting” or “performance management” it would most likely conjure up a flurry of different responses. Oftentimes the terms performance management and performance-based budgeting are used interchangeably while in reality the terms are related but are significantly different in practice, scope and meaning. The terms, as such requires definitional clarity, if they are to be used as the basis for research or evaluation.

Jackson and Broom et al. (1999) defines performance management as, “a method of measuring the progress of a public program or activity in achieving the results or outcomes that clients, customers, or stakeholders expect.” Melkers and Willoughby (1998) defined performance budgeting as “requiring strategic planning regarding agency mission, goals and objectives, and a process that requests quantifiable data that provides meaningful information about program outcomes”. These authors also suggested that performance-based budgeting might also require the agency or program to systematically and routinely

assess progress toward specified performance targets (Melkers and Willoughby 1998).

Performance management, if effectively used by agencies or departments that provide public goods or services, should be the primary basis for informing people (internal and external) of whether or not the program or service is progressing, maintaining or regressing in its efforts (Jackson and Broom et al. (1999).

Performance management is a method or system whereas performance-based budgeting is one of the tools that are used oftentimes as a part of performance management. Jackson and Broom et al. (1999) defines performance-based budgeting, as a budget that bases resource needs on results expected from use of the fiscal allocations. Inclusive within this definition is the requirement that the budgeting practice includes the delineation of quantitative and qualitative expectations and measurement criteria, in addition to the amount of public dollars expended for a program or service. In most cases, performance-based budgets will identify the quantity and quality of services that are anticipated from the agency base on a given dollar amount or budgetary allocation.

Melkers and Willoughby (1998) conducted a study of 50 states concerning existing or planned legislation related to performance-based budgeting as well as administrative or agency directed requirements. Their results indicated that all but three states (Arkansas, Massachusetts and New York) have performance-based budgeting requirements.

Furthermore, their study suggests that most of the states had enacted performance-based budgeting requirements within three years prior to the study.

For the purpose of this study, performance-based budgeting is considered as the tool used by agencies and policy makers to make allocation decisions after taking into consideration

information on the degree to which government programs attain their projected or stipulated goals or outcomes. It is expected that if an agency reports that its management practices are performance based, the tools or processes used will include performance budgeting. If performance budgeting is used, we would expect to see evidence of allocation decisions that increased or decreased resources given to the agency or distributed within the agency based on the outcomes or results of the program or service. This form of budgeting differs quite significantly from the more traditional forms of public expenditure budgeting such as incremental or line item budgeting (Melkers and Willoughby (1998).

The purpose of this research is to study performance measurement in state agencies in order to find out which performance measurement techniques are used at the agency level and what social, political and organization (capacity and culture) is related to performance measurement use. Rather than making inter-state or large institution comparisons such as legislative use, the focus of our examination was looking at performance management activities at the agency or department level within each state. Our decision is consistent with Joyce and Sieg (2000) who argued that researchers should consider studying performance-based budgeting by focusing more attention on analysis of agencies or policy areas, and less attention exclusively on centralized institutions.

Similarly, Willoughby K. and Melkers, J. (2000) noted that information has its strongest impact on the agency level, a slightly dampened effect at the central budget office level, and then a muted effect on the legislative side. Budgeters perceive performance-based budgeting's greatest effectiveness as related to organizational factors that encompass agency management, program results, and coordination among branches. Such reforms seem less

likely to affect political factors (appease the public, which may never be satisfied) or fiscal factors (appropriation levels).

The focus of this research is on the usage of performance measures in state agencies. The utilization of performance measures across agencies is characterized and the relationship between performance measurement and planning is examined. In addition, other factors related to performance measurement are explored—these factors characterize the managerial environment of the agency.

There are three managerial outcome constructs of interests in this study. The first is the overall external infrastructure (statutory/legal) and external influences (societal and political) that challenge the state agencies. This would include the specification of legal mandates, referendums or other statutory requirements as well as citizen concerns, fiscal shortfalls or political philosophy. The second relates to how size, mission and scope of services provided to the public may impact state agencies. This was measured by computing variables, which addressed size of budget and staffing and type of service provided (regulatory, human service, public safety). The third is the assessment of state agency internal capacity, including organizational culture.

The three key hypotheses of this study are:

Hypothesis 1: Agency level usage of performance measurement techniques will vary across states because of the differences in the social and political context of the agency

Hypothesis 2: Agency level usage of performance measurement techniques will vary by agency size, agency scope, and the nature of the public service provided.

Hypothesis 3: Agency level usage of performance measurement techniques will vary by an agency's capacity (including skill level, existence of technical support, data availability, slack

resources, and information infrastructure) and organizational culture (including centralization of authority, capacity for reform, instability and experience with change variables).

The theoretical population for our study is best characterized as the agency-level in state government. The State Yellow Book as published by the Leadership Directories, Inc. for the period of Summer 2000 provides an identification of all agencies, departments, bureaus and commissions that are operated by the 50 states and selected commonwealths and territories. To conduct a study that would include all of the assorted agencies, departments, bureaus and commissions would prove extremely difficult relative to finding an accurate listing of this population. Also, if we were able to acquire an accurate listing, we would be much challenged to mount a national sample across thousands of governmental offices across the U.S. because it is simply too large and complicated for each element in it to be itemized accurately. For this study we determined that the accessible or study population would be those governmental entities that were classified as a “department” in The State Yellow Book (as previously referenced), which amounted to including a total of 876 departments. Of the 876 departments surveyed, 243 departments returned their survey, for a response rate of approximately 28%. Of the 50 states surveyed, responses were received from 48 states.

In addition to the sample being represented by state, there are is also representation across types of agencies. We classified an agency by functional area based on the title of the agency. Table 1 describes these functional areas and the number of sample agencies by functional area.

Survey Instrument and Method

For this study, we used a 55-item mail survey (questionnaire) that contained a closed question format. We used the mail survey option to defray costs and to speed up

Table 1: Number and Percentage of Agencies Respondents by Agency Functional Type

Type of Agency	Number of Agencies	Percentage of Agencies
Administrative	70	29%
Agriculture	14	6%
Corrections	28	12%
Environmental	8	3%
Health and Welfare	40	17%
Education	14	6%
Natural Resources	20	8%
Transportation	21	9%
Veterans/Military	13	5%
Development	11	4%
Unknown	3	1%
TOTAL	242	100%

response time. Studies have shown that mail surveys can be most effective when directed at particular groups, such as subscribers to a specialized magazine or members of a professional association (Fowler 1993). By sending the survey directly to the agency department head, we had hoped to get a higher level of cooperation and participation. The information collected as part of our initial identification of departments included the key contact person along with contact information e.g., e-mail address, phone number etc. After the initial mailing, a follow-up post card notice was sent to all of the department heads to facilitate returns.

The focuses of the survey questions were to find out the usage of performance management techniques in the selected state agencies. In studying these agencies, we sought to ascertain what social, political and organization (capacity and culture) are related to performance management use. The questions very similar in design and content to the measures that were used for the Government Performance Project - City Government Management Performance Criteria as developed by researchers and writers at **Governing** and at Syracuse University's Maxwell School of Citizenship and Public Affairs.

The survey was divided into four essential parts: financial management (FM), human resource management (HRM), information technology management (ITM), and quality management (QM). Part A: Financial Management consisted 10 structured questions that addressed financial management aspects such as budget process used, financial reporting and forecasting. Part B: Human Resource Management consisted of 10-item structured, interval level questions that addressed human resource planning, inputs, outputs and outcomes. Part C. Information Technology Management consisted of 10 structured, interval level questions that addressed information management planning, equipment purchases, data development and distribution and training. The fourth section, Part D: Quality management included a 10-item structured, interval level questions that addressed strategic planning, training, performance monitoring and customer feedback. The fifth section included 13 general and structured questions that consisted of nominal and interval level information, including number of employees, budget size and overall structure of the department.

All of the questions on the survey were 6 point Likert scale where 6 represents "always," 5 represents "very often," 4 represents "fairly often," 3 represents "sometimes," 2 represents

“almost never” and 1 represents “never.” Table 2 gives the average of this scale over all questions in each section by agency type. For each question category the total sample mean is slightly over 4.0—the “fairly often” category.

Table 2: Mean Responses to Overall Category Questions by Agency Type

Type of Agency	Financial Management Mean	Human Resources Mean	Information Technology Mean	Quality Management Mean
Administrative (valid n=52)	4.16	4.02	4.16	4.31
Agriculture (valid n=13)	4.45	4.29	4.07	4.49
Corrections (valid n=28)	3.79	3.89	3.74	3.97
Environmental (valid n=7)	3.80	3.85	4.06	3.56
Health and Welfare (valid n=35)	4.21	3.86	4.05	4.35
Education (valid n=9)	4.22	4.07	4.17	4.04
Natural Resources (valid n=19)	4.18	4.21	4.14	4.35
Transportation (valid n=18)	4.33	3.98	4.09	4.08
Veterans/Military (valid n=12)	4.67	4.48	4.17	4.73
Development (valid n=10)	4.35	3.92	4.37	4.21
TOTAL (valid n=203)	4.18	4.07	4.11	4.18
<i>Note: There were 16 observations with missing or invalid data.</i>				

Survey Results: Performance Management Usage

The initial data set included 54 functional variables, as one item was designated for purpose of requesting a copy of report on the survey results. In order to gain a better perspective on the overall use and practices within each department/agency that reported data, table 3 descriptive statistics on selected survey questions relating to use of performance measures in an agency. One of the key components referenced by Melkers and Willoughby (1999) as necessary for performance management is a “process that requests quantifiable data that provides meaningful information about program outcomes”. The questions summarized in

table 3 all relate to the use of performance measures in the budgeting and management functions. A mean of six for a question would indicate that on average the agencies responded “always” to a question. A five or four indicates the average response is “very often” to “fairly often.” For most of these performance measurement usage questions, the mean response is only slightly above a four. The exceptions are the quality management questions, where the average response was below four—indicating that the survey respondent feels that quality management performance measurement is used less than “fairly often” but more than “sometimes.”

Table 3: Performance Measurement Usage Patterns

Survey Question	Mean	St. Dev.
FMQ3: The agency produces accurate reliable and thorough financial reports.	5.3	1.01
FMQ5: The agency provides key financial and performance data to managers.	4.48	1.15
FMQ6: The agency is able to gauge the cost of delivering programs or services.	4.51	1.04
HRM19: The agency evaluated the performance of its employees effectively.	4.12	1.01
HRM20: The agency provides sufficient opportunity for employee feedback.	4.22	1.04
ITMQ30: The information technology systems support the agencies ability to communicate with and provide services to citizens.	4.20	1.01
QM37: The agency routinely surveys its customers for satisfaction.	3.89	1.37
QM38: The agency relates outputs to specific measurable outcomes.	4.14	1.20
QM39: The agency has an accurate, reliable system for collecting, tracking, and evaluating performance data.	3.96	1.12
QM41: Performance management reviews produce information used in decision-making.	3.80	1.22
<i>Note: The Alpha (Cronbach) for this index was .87, clearly exceeding the minimum .70 thresholds.</i>		

Table 4 summarizes questions related to planning in state agencies. Seven survey questions related to the human resource and quality management planning function. Strategic planning, quality improvement and human resource practice figures very prominently in the performance measurement process. Wholey (1999) in citing activities done by the John Mayne and colleagues in the Office of the Auditor General of Canada, notes that performance management includes a commitment to providing training and technical assistance, developing partnerships designed to improve performance, redesigning central management functions (including human resource management), creating intangible incentives for improved agency or program performance (emphasizing human resource management functions) and delegating greater authority in return for accountability for results (U.S. General Accounting Office 1996a. pp. 18-20).

Planning, training and human resource management processes seem to be a common theme in the literature on performance management. Wilson and Durant (1994) note that employee readiness levels along with training and incentive factors are important determinants for strategic planning. They recommend that research focus on (among many things) planning for and measuring the stages of employee readiness and insuring that they have the skills resources and commitment for change. They also noted that human process factors are targeted too low in most organizations. Berman and West (1995) suggest that strategic planning activities and strategies for increasing employee productivity, e.g., training and incentives, are important characteristics for quality management. They also cited the need for active involvement by HR professionals in removing barriers to change and productivity innovation.

In the next section, regression analysis is used to examine the relationship between the use of performance measures and the existence of planning in these state agencies. In order to do this two indexes were developed based on questions that relate to these two management functions: performance measurement and performance planning. Variables

Table 4: Planning Usage Patterns

Survey Question	Mean	St. Dev.
HRMQ11: The agency conducts strategic analysis of present and future human resource needs.	4.01	1.07
HRMQ12: The agency has sufficient data about its workforce to support analysis.	4.27	1.05
QMQ33: Senior management uses strategic planning to establish future directions.	4.66	1.18
QMQ35: All employees assigned to the agency are trained in quality improvement techniques.	3.56	1.30
HRMQ13: The agency plans to meet its future workforce needs.	4.35	1.16
QMQ31: The agency develops and maintains a strategic plan.	5.04	1.25
QMQ36: The agency has a clear description of who its customers are.	5.03	1.02
<i>Note: The Alpha (Cronbach) was .81 for the PLANIND index.</i>		

that relate to these managerial functions were indexed and reliability analysis was conducted to determine the extent to which the indexed items were related to each other. Reliability analysis allows you to study the properties of measurement scales and the items that make them up. The analysis produces a reliability coefficient known as the Alpha (Cronbach). This is a model of internal consistency, based on the average inter-item correlation. Values greater than .70 are viewed as an acceptable overall index of the repeatability or internal consistency of the scale as a whole. The alpha values for the two indexes presented in tables 2 and tables 4 all exceeded the .70 alpha levels. This implies that constructing an index from the questions in table 2 for performance

measurement usage in the sample is “consistent” Likewise, and index based on the questions in table 4 provides a “consistent” measure of perceptions of agency planning.

Survey Results: Regression Analysis

The section examines the relationship between performance measurement usage and several variables characterizing the agency including the level of planning by the agency. Table 5 provides a description of the variables used in the regression analysis. The dependent variable is the performance management index (MEASIND), discussed in the previous section. MEASIND describes the usage of performance measures across the four management functions for the agencies in the sample. In addition to the planning index (PLANIND), several other independent variables are used to test the hypotheses set forth in section 2.

Four independent variables describe the social and political context of the organization. The political environment is characterized by creating an index that describes the strength of performance management reforms in the state. This index (PMREQ) combines three questions: 1.) Has the agency participated in PM reforms initiated in the state? 2.) Does the governor’s office require or support PM reforms within an agency, and 3.) Does the state legislature require or support PM reforms within an agency? All three of these questions were asked on the same Likert-scale with a high score of 6 indicating that the agency strongly agrees with all three statements. Thus, a high score indicates a state with internal and external PM requirements. The stability of the agency is measured by two variables, a one-year change in the size of full-time equivalent employees (FTECHNG) and a one-year

change in the agencies budget (BUDCHNG).¹ The size of the agency is measured by the agency budget per full-time equivalent employee (BUDPERFTE).

The independent variables also include variables that further characterize features of the agency (according to the survey respondent) that may facilitate performance measurement.

The first variable (SKILL) characterizes the staff knowledge and skill with regard to information technology. Agencies with more knowledge and skill in the area of information technology are hypothesized to use more performance measurement techniques. The budget process of the agency is characterized by two variables, USEMEAS asks whether performance measures are used when funding levels are changed and BUDTIME describes whether the agency faces a two-year budget process. These variables are expected to be positively correlated with higher usage of performance measurement as they would suggest more requirements and more time available for this function.

Table 5: Descriptive Statistics of Regression Model Variables (n=203)

Variable Name	Variable Description	Mean	St. Dev.
MEASIND	Index of selected measurement survey questions—financial management, human resources, information technology, quality management	4.2611	0.7008
PLANIND	Index of selected planning survey questions—human resources, quality management	4.4391	0.7612
PMREQ	Index of selected general survey questions	3.0673	0.6226
FTECHNG	Percentage change in number of full-time employees	0.0021	0.0099
BUDCHNG	Percentage change in budget	0.0048	.0097
BUDPERFTE	Budget per number of full time employees (in thousands of dollars)	788.76	5287.72
SKILL	ITMQ26. The agency’s staff has adequate skills and knowledge in information technology.	4.24	0.90
USEMEAS	FMQ8. The agency revises performance measures and	4.18	1.40

¹ Actual employment and budget figures were requested on the survey and these change variables were calculated from these figures.

	plans when funding levels change.		
BUDTIME	FMQ1. The agency uses a multi-year process for budgeting.	4.47	1.91
HUMRES	Dummy variable for human resource agencies: Corrections, Environment, Health and Welfare, Higher Education, Veterans/Military	0.54	n.a.

The regression results are presented in table 6 for a sample of 203 survey respondents. The independent variables explain about 80 percent of the variation in the performance management usage index and the regression is significant based on the F-test. All of the coefficients have the expected sign, except for two, the coefficients of the FTECHG and BUDPERFTE variables, which are both insignificant. These regression results will be discussed around the hypotheses we presented in section 2.

Table 6: Regression Analysis of Agency Performance Measurement Usage

Variable	Coefficient	St. Error	t-statistic
Constant	0.419	0.252	1.666
PLANIND	0.571	0.045	12.683**
PMREQ	0.009	0.049	1.978*
BUDCHG	-0.178	0.318	-0.560
FTECHG	0.403	0.314	1.286
BUDPERFTE	-0.00	0.000	-0.765
SKILL	0.123	0.035	3.528**
USEMEAS	0.010	0.023	4.183**
BUDTIME	0.002	0.016	1.513

HUMRES	-0.005	0.061	-0.877
Number of Observations	203		
Adjusted R ²	0.81		
<i>Dependent variable is index of performance management usage (MEASIND)</i>			
<i>*Significant at the 0.05 level.</i>			
<i>**Significant at the 0.01 level</i>			

Our first hypothesis was that- *Agency level usage of performance measurement techniques will vary across states because of the differences in the social and political context of the agency.* Willoughby K. and Melkers, J. (2000) suggested that fiscal, and economic status of the state, political culture, and organizational relationships (for example, governor’s office with state budget office) influence reform process. In our study we sought to examine how factors such as, whether the agency has experienced performance management reforms or initiatives (whether initiated internally or externally through the legislature or governor’s office), influence the prevalence in use of performance measurement tools. The regression results suggest that efforts to measure statutory or government-imposed mandates for performance are positively related to the perceived use impact the use of performance measurement in the agencies. As expected, the results indicate high usage where there are legislative, governmental or other externally imposed requirements for performance measurement.

We did not find a significant relationship between budget and employment changes and the usage of performance measurement. The year-to-year differences in the budgets of these agencies were small and a better measure of the budget climate would require more years of data.

Our second hypothesis was : *Agency level usage of performance measurement techniques will vary by agency size, agency scope, and the nature of the public service provided.* As stated above, it was hypothesized that agencies that are larger and have more resources are most likely to use performance measurement techniques. A further belief is that certain programs will not routinely use performance measurement techniques due to their popularity (education, child welfare) or their notoriety (prisons). We measured the size of the agency by the budget per FTE (BUDPERFTE). The department scope was characterized by identifying which agencies were human service focused (represented by a value of 1), while other agencies were valued at 0 for comparison. The determination of which agencies were placed in the category of human service was based on matching the name of the agency with historical or typical focus. There is no way of accurately making this distinction without reviewing other information such as mission statements, websites etc. As such, there is a possibility that some agencies may have been misclassified.

The relationship between size of organizations and performance measurement has been examined by previous studies. Ghobadian and Gallear (1996) found that compared with large organizations, small and medium size enterprises (SMEs) have been slow to adopt total quality management (TQM). Ghobadian and Gallear examined the differences between the characteristics of SMEs and large organizations, the relationship between the size of organization and inherent characteristics of TQM and the effect of organization size on the implementation of TQM. It was there determination that the size of the organization did influence the magnitude and degree of TQM activities initiated by the organization. In addition, Lee and Burns (2000) proposed use of a 10 variable-performance measurement index in order to gain a better perspective on the overall status of performance measurement

in the states. This study suggested that four states (Idaho, Illinois, New York and North Carolina) all achieved the highest possible score of ten. They found no “typical” high usage state and concluded that there was quite a bit of diversity among the states in their use of performance measurement. They did find that state population was a single independent variable found to be related to backsliding (not achieving the same level of measures when compared to previous a previous study) in the use of performance measures. Their study suggests that while population did not appear to be a determinant of initial use of performance measurement, their data suggests that larger states were less likely to backsliding than smaller state during the period studied.

Our findings did not reveal any statistically relevant explanatory variables related to the effects of size (budget, staffing) and the use of performance measures. We also were unable to establish the link between scope of agency (human service versus other) in determining greater prevalence or use. The thought was that agencies that were human service focused are less likely to have heavy use of performance measures. The primary rationale for this hypothesis is the recognition that governmental decisions that directly affect people (education, jobs, mental health) are less likely to have clear and distinct statements and measurements of outcomes. We were unable to significantly show that a statistically true relationship exists between the use of performance measures and agency size, agency scope and the nature of the public service provided.

Our third hypothesis was: *Agency level usage of performance measurement techniques will vary by an agency’s capacity (including skill level, existence of technical support, data availability, slack resources, and information infrastructure) and organizational culture (including centralization of authority, capacity for reform, instability and experience with change variables).* Successful implementation of performance

measurement tools requires a significant investment of human resources and physical capital. It is hypothesized that where departments have progressive human resource practices (training, selection, deployment), sound fiscal management (flexible budgeting, fiscal reporting) and state of art information systems (hardware, programmers, users, reporting), the use of performance management techniques will be more evident and consistent.

The influence of strategic planning in successful implementation of performance measurement is very well documented in the literature. Strategic planning is the process of deciding on objectives of the organization, changes in these objectives, the resources used to attain these objectives, and the policies that are to govern the acquisition, use and disposition of these resources (Anthony 1965; Joyce and Sieg 2000). The activities of strategic planning include: a.) Developing and revising as necessary, a statement of mission and/or vision; b.) Developing goals derived from the mission; c.) Objectives that make the goals operational; and d.) Measurements of performance to determine progress toward goals and objectives. One of the indices established for the measurement of this regression included many of the components contained within the process of strategic planning. This index proved key to the explanatory relationship between performance measurement and planning. The coefficient of the planning index is positive and significant.

We also examined the relationship between perceptions of staff information technology and skill levels and performance measurement. The estimated coefficient of this variable is positive and significant. Other studies have also suggested that the capacity to use information technology in performance measurement is an important indicator of actual usage.

Finally, we examined whether features of the budget process were related to performance measurement in agencies. The use of performance measures in budget reallocations (USEMEAS) was positively related to performance use and this relationship is significant. Whether the agency faces a multi-year budget process does not seem to influence performance measurement usage—the coefficient of BUDTIME is insignificant.

Conclusions

Overall, the combined results of this study suggest that concentration and implementation of planning strategies improves the development and use of performance measures. The study seems to establish a very strong link between activities related to planning and the use of performance measures. This finding is very consistent with previous findings in the literature. The regression results also indicated a positive and significant relationship between organizations variables that measured whether performance management reforms had occurred, the information technology skill of the employees and the usage of performance measures in budget reallocations.

There is room for further exploration of other variables that were included in the survey. One important aspect not examined is the relationship between planning, measurement, implementation and outcomes. Many of the respondents report use of many of the performance measurement tools but not much is known about to what extent have the tools resulted in desired outcomes. Grifel (1994) indicates that there are three levels of uses for performance measurement data. The first level is accountability reporting by the local government to the public it serves. The second level is the use of data and information for management and improvement of operations. The third level is to use measurement data

for budgetary decision-making and allocation of resources. Grifel suggests that very few entities move past the first two levels. This study seems to suggest that the planning and measurement components are in operation in most departments. In another study, Poister and Streib (1999) note that while 60 to 80 percent of municipal jurisdictions purport use of performance measures, data shows that fewer than 40 percent make any kind of meaningful use of performance measures in their management and decision processes. There remains question relative to how this information is used to impact budgetary decision-making and allocation of resources.

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