BUDGETGUARD: BEHAVIOUR-DRIVEN MONITORING SYSTEM FOR TRANSPARENT PUBLIC FINANCE

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ABSTRACT

Despite numerous public financial reforms, issues such as overspending, underutilisation of resources, and inefficient budget management continue to be reported in public sector audits. One underlying factor contributing to these inefficiencies is budgetary slack, a practice where budget preparers deliberately create financial buffers by overstating costs or understating revenues. This innovation proposes BudgetGuard dashboard, an integrated data-visualisation and monitoring platform designed to enhance accountability in public budgeting processes. The dashboard combines financial data with behavioural indicators derived from budgeting practices to provide a real-time overview of budget planning integrity. The system tracks patterns such as repeated budget overestimation, abnormal spending spikes, and consistent underutilisation of allocated funds. These patterns are analysed alongside behavioural indicators linked to managerial decision-making, including organisational norms and risk perception. The dashboard translates complex budgeting data into intuitive visual analytics that allow policymakers, auditors, and oversight bodies to identify behavioural red flags in budgeting processes. By linking behavioural insights with financial performance data, the platform enables proactive monitoring of budgeting practices rather than relying solely on post-audit investigations. The innovation contributes to strengthening transparency, improving governance, and enhancing public trust in government financial management systems. It also provides policymakers with actionable insights for designing behavioural interventions that discourage opportunistic budgeting behaviour.

KEYWORDS: Budgetary Slack, Budget Transparency, Public Financial Management, Public Sector Budgeting

PROBLEM AND OBJECTIVE

The National Audit Department continue to highlight recurring issue in public financial management, such as inefficient budget allocation, underutilisation of resources, and overspending (National Audit Department, 2022, 2026). These recurring issues weaken public budget transparency, reduce public

accountability, and impede the effective delivery of public services. One underlying behaviour that contributes to these inefficiencies is budgetary slack, in which budget preparers deliberately create financial buffers by overstating expenditures and understating revenues (Mohd Sairazi et al., 2024). Such opportunistic budgetary practices may be influenced by behavioural biases, organisational norms, and perceived pressures. Existing public finance monitoring systems typically focus on expenditure outcomes only after the budget cycle has been completed. This limits the ability to detect risks and warning signs early, during budget planning stage, causing budget inefficiency to develop into a larger financial problem

The objective of this innovation is to develop BudgetGuard, an integrated data-visualisation and monitoring system to enhance accountability and transparency of public finance. Specifically, this innovation aims to:

1. detect financial irregularities in public budget through real-time visual monitoring
2. integrate behavioural indicators with financial data to identify behavioural and financial red flags during the budget planning stage
3. enable early intervention in budgeting practices before inefficiencies become systemic

DESIGN DESCRIPTION

BudgetGuard is an integrated dashboard system that brings together financial indicators and behavioural risk indicators in a single visual platform, enabling a more transparent, accountable, and proactive approach to budgeting. BudgetGuard captures important financial patterns, such as repeated budget overestimation, unusual spikes in spending at the end of the year, and persistent underutilisation of allocated funds. It also incorporates behavioural indicators pertaining to managerial decision-making, such as organisational norms, risk perception, and behavioural tendencies associated with opportunistic budget preparation. This integrated approach allows BudgetGuard to detect not only financial irregularities but also the behavioural signs that may contribute to them. The platform's main features include real-time budget monitoring, budget integrity scoring, behavioural risk alerts, department-level comparisons, irregularity detection, and visual charts with alert functions for early intervention. The system is intended for local government administrators, ministry officers, policymakers, and public sector oversight bodies. Its unique selling point is that it combines behavioural indicators with financial analytics, instead of relying solely on conventional financial reporting.

VISUALS



NOVELTY AND UNIQUENESS

BudgetGuard moves beyond traditional financial monitoring tools by integrating behavioural indicators into public budget analysis. It links financial irregularities with behavioural patterns that may serve as early signals of opportunistic budget preparation. This distinctive approach distinguishes BudgetGuard from existing public finance monitoring systems that mostly focus on numerical expenditure reporting, compliance checks, and post-audit review.

The uniqueness of BudgetGuard lies in three main aspects. First, it integrates financial analytics with behavioural monitoring in a single platform. Second, it offers early warning features through identification of opportunistic behaviour patterns such as repeated overestimation, persistent underutilisation, and unusual spending spikes before budget inefficiency become more severe. Third, it transforms complex financial data and behavioural information into visual insights that are practical for policymakers, auditors, and oversight bodies.

BENEFITS TO MANKIND

BudgetGuard contributes to society by supporting more transparent, accountable and efficient management of public funds. Its visual analytics and early warning functions enable earlier detection of suspicious budgeting patterns which further facilitate in minimising wasteful expenditure, strengthen public sector governance, and improve the allocation of resources for essential public

services. In the long term, its supports greater public trust in governance financial management and encourages more responsible stewardship of public resources.

COMMERCIAL POTENTIAL

BudgetGuard provides strong potential as a digital governance solution for local governments, audit departments, ministries, and other public management institutions. The integration of behavioural monitoring with financial analytics in a single platform, offering a more comprehensive and proactive approach than conventional budgeting dashboards that solely focus on financial data. The platform can be scaled as a subscription-based software service, a customised dashboard for government agencies, or an integrated module within existing public finance management systems. Its flexibility and adaptability across institutional contexts further strengthen its potential for broad adoption across different levels of government.

CONCLUSION

BudgetGuard introduces an innovative approach designed to improve public finance governance, specifically in planning, monitoring, and managing budget. What makes this public finance platform distinct is it integrate behavioural intelligence with financial monitoring in a single dashboard platform. This platform enables proactive identification of behavioural and financial red flags early, during the budget planning stage rather than waiting for budget cycle to complete. Through its visual analytics and early warning features, the platform improves budget transparency, strengthens accountability, and support smarter use of public funds. Looking ahead, the future development envisions pilot implementation of BudgetGuard in local government institutions, the integration of AI-driven anomaly prediction, and integrated more widely with national public finance management systems, strengthening BudgetGuard's scalability, effectiveness, and long-term impact.

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