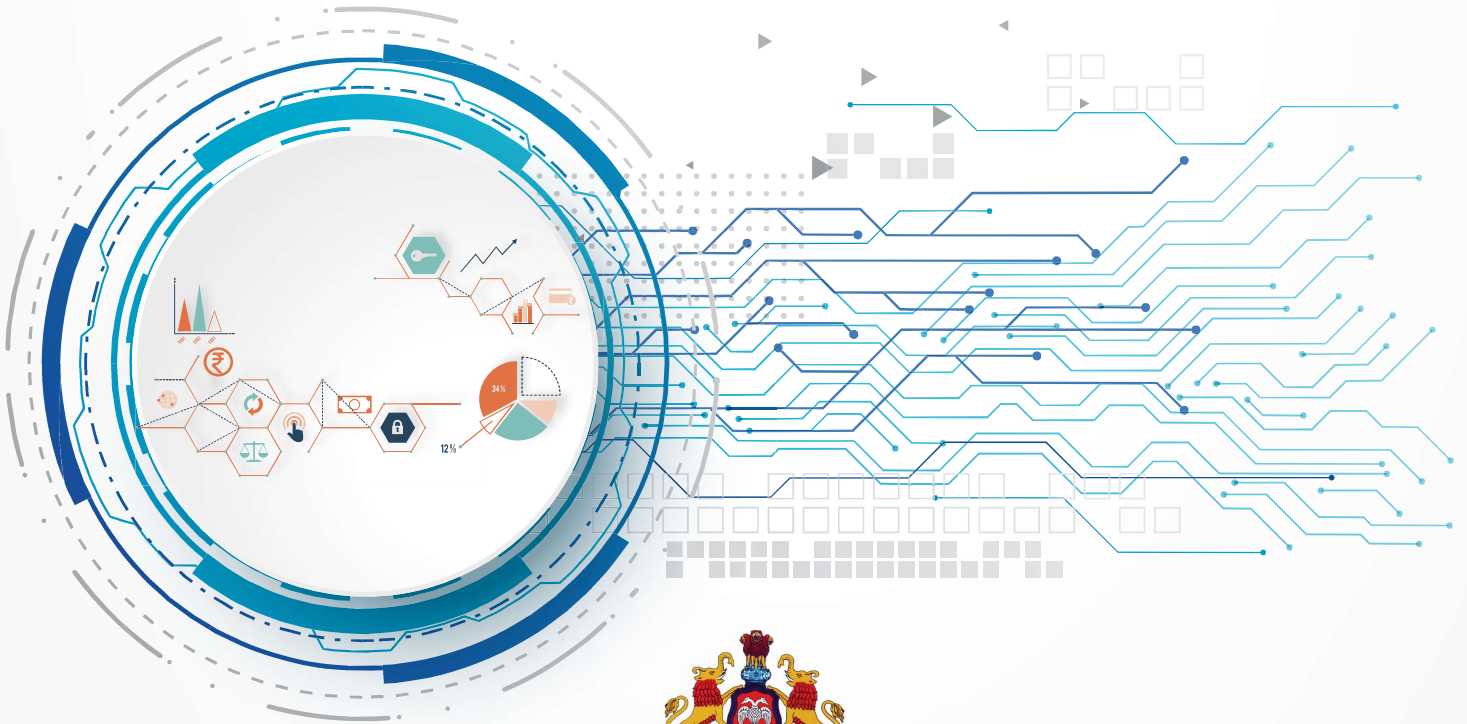




# REPORT OF THE COMPTROLLER AND AUDITOR GENERAL OF INDIA

## PERFORMANCE AUDIT ON INTEGRATED FINANCIAL MANAGEMENT SYSTEM-KHAJANE-II



**GOVERNMENT OF KARNATAKA  
REPORT NO. 4 OF THE YEAR 2021**

**Report of the Comptroller and Auditor  
General of India**

**Performance audit  
of  
Integrated Financial Management System-  
Khajane-II**

**Government of Karnataka**  
*Report no. 4 of the year 2021*



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## Preface

1. This Report of the Comptroller and Auditor General of India for the year ended 31 March 2021 has been prepared for submission to the Governor of Karnataka under Article 151 (2) of the Constitution to be tabled in the State Legislature.
2. The Report covering the period 2015-20 and updated till March 2021, contains the results of performance audit of 'Integrated Financial Management System-Khajane-II'.
3. Audit has been conducted in conformity with the Auditing Standards issued by the Comptroller and Auditor General of India.



# Executive Summary

In the year 2001, State Government implemented a Treasury Computerisation Project Khajane (K1) for automating the Treasuries in the State. During 2009, the State Government took the initiative to replace the existing K1 system with a new Integrated Financial Management System called Khajane-II (K2). The K2 Application was envisaged to bring all State Government departments in an integrated environment to enable direct system-to-system exchange of information without manual interactions. K2 also proposed to extend its reach to the citizens towards easing and streamlining processes for Government remittances. The Performance Audit (PA) attempted to ascertain whether the K2 realized the envisaged objectives of upgradation, integration and business process re-engineering, information system controls including security controls in K2, safeguarding the assets, data integrity and secure and uninterrupted treasury operations towards improving the effectiveness and efficiency of Government's financial operations. The K2 Application comprises of 24 modules and was proposed to be implemented in two Stages- Stage I comprised of 13 modules for achieving the K1 capabilities and Stage II consisted of 11 modules towards building additional capabilities envisioned in K2. Both the stages were intended to be rolled out by February 2013 after migration of entire K1 data, proper third-party performance audit, security audit and a declaration of "Go-live".

The Department did not undertake a business process re-engineering exercise. Though the revision of Financial Codes were envisaged as a preparatory activity, it was not completed.

**(Paragraph 2.3.1)**

The capability to support the implementation of Indian Government Accounting Standards remained limited as the associated business rules were not made part of the application.

**(Paragraph 2.3.2)**

Tracking funds drawn on grant-in-aid bills was not facilitated as there was no provision of monitoring the submission of utilisation certificates.

**(Paragraph 2.3.3)**

The agreement was not revised to accommodate the extension of time. Though the agreement envisaged declaration of 'Go live' after complete roll out of all modules before commencement of operation and maintenance (O&M) phase, 'Go-live' could not be declared.

**(Paragraph 2.5)**

The development was delayed, modules were rolled out partially, and the O&M was concurrently undertaken without modifying the agreement. The O&M was extended without considering the delay in development and roll out of modules. The Department lost a minimum of two years of O&M period and incurred an additional financial commitment of ₹38.75 crore.

**(Paragraph 2.6.5)**

The Department did not obtain the custody of application source code, detailed data dictionary which were critical in understanding the internal architecture of the application.

**(Paragraph 2.6.8)**

The State Government did not have adequate strategic control over K2 application, an important asset it developed out of its investment, which resulted in its continued dependency on the System Integrator for ensuring continuity of operations. The K2 was found to be implemented around a work-flow engine proprietary to the System Integrator. The Project's preparedness to avoid a vendor lock-in was inadequate. The dependency on proprietary software was not assessed and mitigation measures were not put in place.

**(Paragraph 2.6.9)**

The K2 implementation was impacted by the deficiencies in software contract management practices. While the Master Service Agreement was originally entered into adopting a Waterfall Model of application development with specified milestones for delivering Application in two phases, the Project completely deviated from the agreed development model and timelines rendering the contract redundant.

**(Paragraph 2.7.1)**

The important software quality assurance processes such as third-party audit and security audit were not in place. The Department deployed the modules and their updates without subjecting them to third party audit and security audit.

**(Paragraph 2.7.3)**

The Enterprise Management System and Service Level Agreement monitoring tools were not set up by the System Integrator which was required to assist the Department to monitor the operations on a continuous basis. The quality of the service delivered by the System Integrator was thus not measurable.

**(Paragraph 2.7.4)**

The K2 also did not obtain any knowledge transfer with reference to the K2 architecture and database. The envisaged expert team for coordinating with the System Integrator on application, database and security domains were not deployed by the Government.

**(Paragraph 2.7.5)**

The Project was expected to be developed and rolled out in all aspects by February 2013 but even as of March 2021, it was not completed. The first set of modules were rolled out only in September 2015. PA observed that development of 22 modules were completed at present (13 modules of Stage I and 9 modules of Stage II). Six out of the nine implemented modules of Stage II were not in use. As a result, K2 Project was yet to achieve all of its intended objectives and expected outcomes even after more than a decade since its conception.

**(Paragraph 3.1.1)**

The K2 implementation covering the functions of budget preparation, expenditure tracking, cash management, management of Government debt and guarantees, financial assets management was incomplete even as of March 2021 affecting its ability to serve the expectations of an Integrated Financial Management System. The K2 was yet to build the capability for tracking expenditure along multiple years as the expenditure tracking module was not operational.

**(Paragraph 3.1.3)**

Though integration was a key component of the Project, the strategy for its implementation and timelines were not specified. As a result, the implementation of integrations was delayed/partial with Public Finance Management System, Human Resource Management System and integrations with Accountant General, Planning Department was absent. The K2 was yet to achieve the envisaged capability for preparation of daily accounts.

**(Paragraphs 3.2.1 and 3.2.2)**

While the Project was successful in digitizing transactional level treasury processes and capturing financial data, the value of the data collected could not be unlocked and fully utilized as they were not used for gaining analytical insights.

**(Paragraph 3.3)**

The Project, instead of launching as a complete package, was rolled out in an incremental manner for a prolonged period from 2015 to 2021. This impacted the changeover from K1 to K2 application and resulted in capturing of financial data in two separate silos with no interconnectivity, thus, limiting the capability of the K2 to provide comprehensive financial information. The Project was yet to implement the planned business processes into the K2 and as a result, several business processes still remained outside the K2 Application.

**(Paragraph 3.3.2)**

Grants are being drawn on payee receipts bills impacting the monitoring of utilization of these grants.

**(Paragraph 3.6.3)**

The voucher information captured by K2 was incomplete as it did not have reliable sanction order and sub-voucher information creating a continued dependency on manual records for referencing and tracking. There was no facility to upload the manual sanction orders and manual sub-vouchers impacting the referenceability of the voucher data.

**(Paragraph 3.6.10)**

PA noticed instances of weak application controls leading to excess release of funds, case of double payment of General Provident Fund bills, double payment of refund bill, continued payment of salaries even after retirement of employees *etc.*, in respect of the selected modules for test check.

**(Paragraphs 3.5.5, 3.6.4 and 3.8.1)**

PA observed non-completion of Management Information System reports and deficiencies in Management Information System reports developed in K2.

**(Paragraph 3.11)**

Information Technology Act, 2000 and Rules thereunder require the conduct of security audit by an independent auditor duly approved by the Central Government atleast once a year or as and when significant upgradation of the infrastructure happens. K2 processes sensitive financial information and security breaches would result in serious implications for the financial assets and may also cause reputational damage to the Government. PA observed that the third party security audit of K2 covering application, network components was not conducted periodically and the coverage was not comprehensive. Since the periodicity and coverage of the security audit was insufficient, PA was not in a position to derive assurance on the robustness of the security controls over the K2 application.

**(Paragraph 4.1.2)**

PA noticed that Digital Signature Certificate implementation, a crucial aspect of authorization and non-repudiation, was deficient as components of voucher data such as recipients, sub-voucher information were kept outside the coverage of the digital signature. Though online exchange of data with encryption and digital signing was introduced, the procedures for establishing the non-repudiation was not in place. Audit observed instances of transactions without digital signatures which impacted the overall reliability of the digital signature process.

**(Paragraph 4.2.2.3)**

Audit also demonstrated weaknesses gaining administrative level privileges exploiting password vulnerabilities, breach of the restrictions placed on treasury network, the weaknesses of bill processing to tampering *etc.* The security weaknesses noticed in the Application have the potential to expose critical financial information to inappropriate access and therefore, poses the risk of compromising the confidentiality and integrity of the information.

**(Paragraph 4.8.3)**

Monitoring of the Project at the Government level lacked vigour as evidenced by the lack of periodical timely review of the Project by the empowered committee during the crucial period of project implementation

**(Paragraph 5.1)**

PA noticed that the Department did not specify performance indicators for measuring and monitoring the efficiency of various processes. PA noticed that lack of timelines for processing of the bills, re-processing of the failed payments, *etc.*, affected the efficiency of Application System.

**(Paragraph 5.4)**





**Chapter I**  
**Introduction**





### 1.1 Need for *Khajane-II*

The Government of Karnataka implemented '*Khajane*' (hereinafter referred to as K1) – an Information Technology (IT) platform for computerization of Treasuries from 2001. The State Government decided (2009) to upgrade K1 into an Integrated Financial Management System<sup>1</sup> (IFMS) known as '*Khajane II*' (hereinafter referred to as K2). K2 proposed to use latest web-based technologies with electronic interface with the citizens. It also proposed to electronically integrate with external stakeholders like bank, Accountant General *etc.*

The K2 project aimed to:

- facilitate the State's development through efficient, effective and transparent management of its public finances, strengthen accountability of the stakeholders;
- provide an integrated electronic platform to all stakeholders, to carry out their financial transactions and to share data in a seamless manner, for their decision making, accounting and auditing of public finance;
- to provide tighter security of data and audit trail of all activities carried out within the system;
- To bring greater transparency in treasury functions along with participative accountability.

Thus, it was envisaged that K2 will replace the existing challenges of K1 system<sup>2</sup> and address functional and technical constraints so as to enable a dynamic fiscal management for all users within and outside the Government.

### 1.2 System Integrator for K2

The State Government entrusted (October 2011) the implementation of the project to M/s Tata Consultancy Services (TCS), which was identified as the System Integrator (SI) through a tendering process. The scope of the work included Application Software Development, providing IT Infrastructure for the Application, data migration, end user training and Operation and Maintenance

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<sup>1</sup> Integrated Financial Management Systems are systems to support management of public sector budgetary, financial and accounting operations and promote better public sector financial management with a centralised registry of public sector revenues and expenditures. The IFMS integrates budgetary, accounting and treasury and public debt management processes as well as generate corresponding reporting documents.

<sup>2</sup> K1 was designed in the year 2001 with limited technical capabilities and connectivity. It had various security gaps in the application; it was not capable of handling the workload requirements and was based on limited bandwidth system; it could render only monthly accounts but not daily accounts, *etc.*

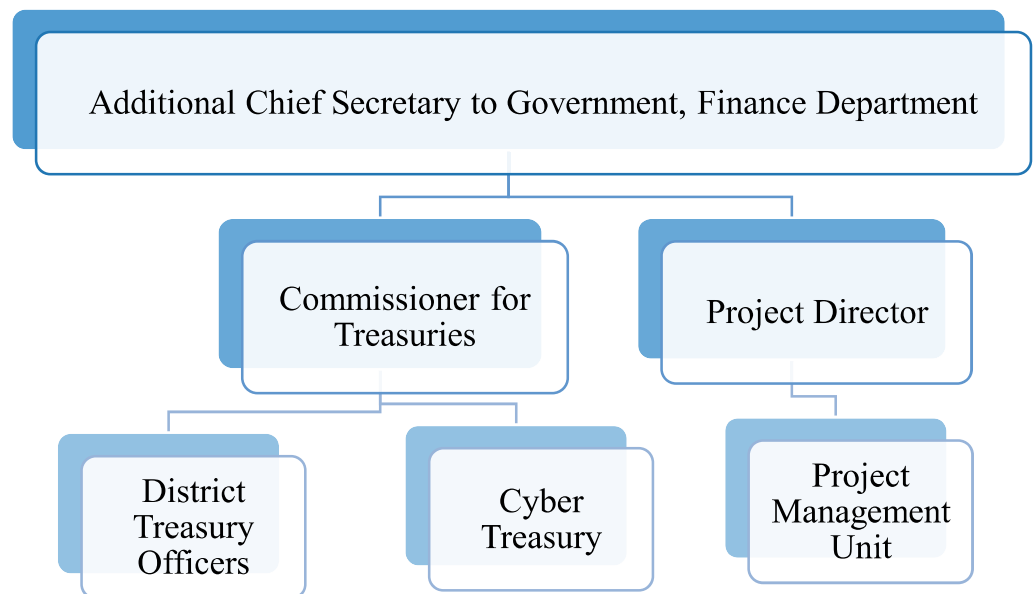
(O&M) of the System. The SI would establish the system and provide O&M support for six years.

### 1.3 Broad technical features of K2

K2 is a web-based application with two separate user portals over the internet and intranet. The internet portal acts as a web interface for delivering citizen centric services and the intranet portal is for the department users and acts as a single platform for all application services. Users are provided access to the services based on their roles after due authentication and authorisation. Karnataka State Wide Area Network (KSWAN) is used for providing connectivity to the treasuries of the State Government.

### 1.4 Organisation structure

The Additional Chief Secretary (ACS) to Government is the administrative head of the Finance Department (FD). The Department of Treasuries (DoT) headed by the Commissioner for Treasuries, which functions under the FD and manages the accounts of the Government, is responsible for implementation of K2 Project. The Project Director oversees the implementation of the Project and is assisted by a Project Management Unit (PMU) for day-to-day operations. The contractual obligations of the System Integrator are monitored by the Project Director in accordance with the terms of the Master Service Agreement (MSA).



### 1.5 Audit objectives

The Performance Audit (PA) sought to ascertain whether:

- The Project realised the envisaged objectives of automating the treasury functions and integrating them with the stakeholder applications;
- The Business Rules embodied in the various rules and codes of the State were incorporated in the K2 Application;
- Information system controls in K2 Application were capable of safeguarding assets, ensuring data integrity and provided for secure and uninterrupted treasury operations; and

- K2 Application contributed to improving the effectiveness and efficiency of Government's financial operations.

## 1.6 Audit criteria

The audit objective-wise criteria for PA were derived from the following:

- ✓ Karnataka Treasury Rules and Government of India guidelines on Computerisation of Treasuries;
- ✓ Karnataka Financial Code and Karnataka Budget Manual;
- ✓ The Master Service Agreement and the General Principles of Information Systems Governance, Development and Maintenance;
- ✓ Vision and Mission of the Project.

## 1.7 Audit scope and methodology

The PA for the period 1 April 2015 to 31 March 2020 was conducted during February 2020 to December 2020. Six<sup>3</sup> out of 12 modules in operation as of March 2020 were selected for detailed check. The audit methodology involved the following:

- i) Document analysis relating to project implementation;
- ii) Analysis of the Application Controls and User Interface;
- iii) Analysis of the Master Service Agreement, Service Level Agreements;
- iv) Analysis of databases using data dumps provided;
- v) Analysis of network performance, security controls.

An entry conference was held on 6 July 2020 with the Additional Chief Secretary, Finance Department in which the audit objectives, methodology, scope and criteria were explained. An exit conference was held on 26 October 2021 with Finance Department. The report takes into consideration the replies of the Government and the views expressed in the exit conference. In view of the Government replies, the PA has been updated till March 2021.

## 1.8 Acknowledgement

Audit acknowledges the cooperation and assistance extended by the State Government, Treasury Network Management Centre (TNMC) and staff of TCS in conducting the PA.

<sup>3</sup> Bill Preparation and submission, Bill Processing, Payment Authorization, Accounting, Budgetary Control and General Module-Master Data Management.

## **1.9 Organisation of audit findings**

The audit findings are organised as follows:

Chapter 1 – Introduction

Chapter 2 – Project Management

Chapter 3 – Project Implementation

Chapter 4 – Project Security

Chapter 5 – Monitoring and Evaluation

Chapter 6 – Conclusion and Recommendations

# Chapter II

## Project Management





# 2

## Chapter

# Project Management



### 2.1 Project Planning

The K2 project implementation envisaged a single point responsibility for provision of infrastructure, software and maintenance to be entrusted to a System Integrator (SI) to be selected through tendering. Key features of the project structuring included collaborative development of project documents in consultation with the short-listed bidder, bundling of application development, hardware supply and maintenance responsibilities in a single contract, specific service level benchmarks to be monitored by an automated tool and selection of the lowest bidder from the technically qualified bidders.

#### 2.1.1 Selection of System Integrator

The DoT prepared and submitted a Detailed Project Report (DPR) for implementation of the Project. The DPR contained the cost projections for K2, schedule of implementation, expected benefits *etc.* The cost of development and implementation of project for a period of seven years was estimated at ₹90.71 crore. The project was proposed to be funded through Government of India (GoI) funds, 13<sup>th</sup> Finance Commission Grants and the State Government funds.

DoT invited (October 2009) Expression of Interest (EOI) for shortlisting vendors who were interested in participating in the tender for the implementation and maintenance of the K2 project. In response to this, 13 firms expressed their interest. The eligibility of the bidders was evaluated by the Tender Scrutiny Committee. The Steering and Tender Accepting Authority for K2 considered 10 bidders as eligible for the Request for Proposal (RFP) for K2. In response to the RFP document only seven bids were received as three shortlisted bidders did not opt to respond. After evaluation of the bids, the commercial bids of the six vendors were opened (July 2011). The commercial proposal submitted by M/s TCS was found to be L1 with a total project cost of ₹79.62 crore.

The DoT issued (September 2011) the work order and the MSA was signed between DoT and TCS on 18 October 2011.

The expenditure incurred towards the project as at the end of March 2020 was ₹130 crore which included software development cost, providing infrastructure at treasuries and consultancy charges *etc.*

### 2.1.2 Cost components of the contract

The MSA was executed with the SI for a contract price of ₹79.62 crore. The accepted financial proposals comprised of the components indicated in **Table 2.1**.

**Table 2.1: Components of the contract**

(₹ in crore)

Sl. No	Item of Expenditure	Initial Cost	Annual maintenance charges	Total charges
1	Cost for Application Software	11.49	13.89	25.38
2	Cost for IT Infrastructure	21.65	10.62	32.27
3	Cost for System Software <i>etc.</i>	9.26	3.33	12.59
4	Training Cost	1.74	0	1.74
5	Data Migration / Digitisation Costs	0.61	0	0.61
6	Man power costs	0	3.00	3.00
7	Consumable Cost	0.58	3.45	4.03
	<b>Total</b>	<b>45.33</b>	<b>34.29</b>	<b>79.62</b>

Source: Commercial Bid Proposal of TCS

Component-wise cost analysis showed that IT infrastructure which mainly includes procurement of hardware comprised 40 *per cent* of the total cost followed by application software and system software. The expenditure incurred by the SI towards the project as at the end of March 2020 was ₹52.38 crore. The deviations and deficiencies observed during detailed scrutiny of contract management documents are brought out in Paragraph 2.6.

## 2.2 Project Financial Management

### 2.2.1 Delay in implementing the project - Loss of central assistance

Under the Mission Mode Project – Treasury Computerisation, GoI would release the central share to the designated State/Union Territory (UT) in three instalments of 40 *per cent*, 30 *per cent* and 30 *per cent* respectively. The States/UTs were required to complete their project in three years and any residual components were allowed to be spilled over into the fourth year. The release of instalments was, however, based on the achievement of stipulated milestones as indicated in **Table 2.2**.

**Table 2.2: Statement showing the milestones prescribed for release of central assistance**

1 <sup>st</sup> instalment	<ul style="list-style-type: none"> <li>On submission of the proposal</li> </ul>
2 <sup>nd</sup> instalment	<ul style="list-style-type: none"> <li>Utilisation of the amount released earlier.</li> <li>Purchase or part purchase of hardware/upgradation of hardware.</li> <li>Purchase/development of software.</li> <li>Completion of Business Process Re-engineering (BPR) exercise.</li> <li>E-connectivity (at least through e-mail) between district treasuries and Finance Department of State/UT</li> </ul>

	<ul style="list-style-type: none"> <li>• Commencement of training of staff.</li> <li>• Achievement of milestones as per approved plan</li> </ul>
3 <sup>rd</sup> instalment	<ul style="list-style-type: none"> <li>• Utilisation of the amount released earlier and State/UTs' share of 25 per cent</li> <li>• Completion of code amendment exercise.</li> <li>• Demonstrated connectivity with Reserve Bank of India, Accountant General(AG), Controller of Government Accounts and agency banks.</li> <li>• Operationalisation of all the modules in accordance with the guidelines</li> </ul>

Source: Mission Mode Project-Treasury Computerisation Guidelines

GoI released (March 2012) ₹9 crore towards first instalment against the proposal of the State for ₹22.50 crore. Further instalments were not released as the State failed to achieve the stipulated milestones. Consequently, the State lost an opportunity of central assistance of ₹13.50 crore.

The Government stated (November 2021) that department had repeatedly requested for release of funds from GoI. Audit observed that as the Business Process Re-Engineering (BPR) exercise of amending the financial codes was not completed, the requirements for central assistance fund releases were not fulfilled even as of March 2021, as brought out in the paragraphs below. The department lost an opportunity to avail the central assistance.

## 2.3 Mapping of Business Rules

### 2.3.1 Business Process Re-engineering exercise not undertaken

The guidelines of Mission Mode Project - Treasury Computerisation recognized that large part of the Treasury Computerisation would become possible only after the relevant codes are amended by the State and hence provided for BPR for re-engineering of the existing processes and introduction of new processes where necessary, to ensure synergy of these processes with electronic systems. Each State/UT was required to prepare an action plan covering *inter alia* the changes required in procedures, practices, codes, manuals and laws such as provision for use of digital signatures, file formats, transfer of funds electronically *etc.*, with explicit timelines to ensure achievement of these objectives. Further, completion of BPR exercise was one of the prerequisites for release of second instalment of central assistance.

Audit observed that the DPR submitted (April 2011) to GoI proposed changes to Karnataka Treasury Code (KTC) and Karnataka Financial Code (KFC) leading to acceptance of digital submission of account details to AG. The DPR specified documentation of changes required over KTC and KFC, synchronization of changes with the recommendations in the Functional Requirement Specifications (FRS), submitting the changes to Cabinet for approval and drafting of legislation to bring in appropriate changes. The sub-committees on functional requirements were made responsible for identifying the changes required to KTC and KFC so that they align with the technology. These committees would review the implementation of legislative changes required and redrafting of the codes.

However, the BPR action plan was not prepared. Review of the KTC/KFC and budget manuals to align and transform the business processes to leverage the computerization was also not undertaken by the State Government from the inception of the project. Non-preparation of BPR despite being a condition for release of central grants point to the deficient project implementation.

The Government stated (November 2021) that FD had initiated the process of updating the financial codes.

### ***2.3.2 Compliance to Indian Government Accounting Standards not facilitated***

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The Indian Government Accounting Standards (IGAS) 1 published on 10 December 2010 deals with disclosure requirements for guarantees given by Governments. This standard provides formats (class-wise and sector-wise) for the information to be disclosed in the Finance Accounts. These reports are not available in the K2 system and further these report formats have not been included in the list of reports required as per the System Requirement Specifications (SRS)<sup>4</sup>/FRS.

Similarly, IGAS 2 was published in May 2011 dealing with Accounting and Classification of Grants in Aid (GIA). GIA disbursed by a grantor to a grantee shall be classified and accounted for as revenue expenditure in the Financial Statements of the grantor irrespective of the purpose for which the funds disbursed as GIA are to be spent by the grantee. Expenditure on GIA for the purpose of creating assets shall not, except in cases specifically authorized by the President on the advice of the Comptroller and Auditor General of India, be debited to a capital head of account in the Financial Statements of the Government. The FRS and SRS did not incorporate this requirement and it was observed that the business rule was not implemented in K2.

Analysis of the voucher data showed that there were 176 vouchers of bills type GIA amounting to ₹3,950 crore during the financial years 2018-19, 2019-20 and 2020-21 which are debited to different expenditure heads in the capital account. Non-implementation of the IGAS 2 standard thus resulted in revenue expenditure of ₹3,950 crore being misclassified as capital expenditure during the financial years 2018-19 to 2020-21.

The Government stated (November 2021) that guarantees are operated by AG and do not form part of treasury operations. The reply is not acceptable as the FD monitors the guarantees and K2 had proposed to capture even the non-treasury transactions.

***The Government may provide for appropriate handling of these classes of transactions to make the management of Public Finances effective and strengthening the accountability to the stakeholders.***

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<sup>4</sup> SRS – System Requirement Specification is a description of the software to be developed

### 2.3.3 Status of Utilisation Certificates not made part of K2

The State Government provides grants to various agencies and individuals. At the time of release of these grants, the expenditure is charged off to the functional head of account. The effectiveness and utilisation of GIA released by the State Government is monitored through the mechanism of Utilisation Certificate (UC). The grantees submit the UCs to the department which, in turn forward to the AG (Accounts & Entitlement (A&E)) within the time stipulated in the grant letter. In accordance with the provisions of KFC, the UCs are to be submitted by the grantees within 18 months of sanctioning the grants. UCs outstanding beyond a specified period indicates absence of assurance on utilisation of grants for intended purposes.

Audit scrutiny of FRS and SRS documents showed that the controls for monitoring of the utilisation of grants was not made part of the requirements of K2. There was a pendency of 51 UCs amounting to ₹182.49 crore as of March 2020.

The Government stated (November 2021) that UC was not in the scope of K2. This reply is not tenable as the FRS of K2 had envisaged quick submission of the UCs as a benefit to be realized by the FD. The technical proposal submitted by the SI had accordingly provided for facility for submitting UC and its periodic monitoring by their controlling officers.

## 2.4 Deficient Master Service Agreement

The MSA comprises of the Service Level Agreement (SLA), the operation requirements, acceptance criteria *etc.* Scrutiny of the MSA revealed the following deficiencies.

### 2.4.1 Project Engagement Definition Document was not prepared

The MSA mentions about Project Engagement Definition Document<sup>5</sup> (PEDD), a document describing the services to be performed under the MSA. However, audit observed that the PEDD was not prepared and made part of the MSA. Absence of PEDD resulted in non-description of the services to be provided by SI and also hampered the monitoring of the services delivered by the SI. The Project Director stated (August 2020) that no separate PEDD document comprising the operational components of the RFP and MSA was prepared under the project.

Government, however, shared (November 2021) the Engagement and Development Methodology - Best Practices document stating that PEDD was prepared. Audit observed that the scope of the document shared as PEDD was limited to defining a set of operating procedures to be used as guideline for implementation of project against the listing and description of services as intended in the MSA's definition of PEDD. The document was not signed by both the parties as proof of agreement.

<sup>5</sup> Project Engagement Definition Document (PEDD) means a written document forming part of MSA. Document describes overall scope, services to be performed, infrastructure and staff details *etc.*, to control the project implementation effectively.

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**2.4.2 *The timelines for deployment of hardware and networking component not specified in agreement***

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According to RFP, the SI shall ensure deployment and roll out of the entire solution, including hardware, software and networking components, across the entire State of Karnataka in a time bound manner as specified in Section 8 of RFP Volume I. The detailed scope of work, roles and responsibilities of SI for K2 system were stated to be discussed in detail in section 8 of the RFP document. On a review of the RFP documents, it was observed that it did not contain the detailed scope of work, responsibilities and timelines specified for the SI. Instead, it discussed about the high-level requirements of Strategic Control over the Application system by the Government. Such incorrect cross references point to inadequate vetting of the agreement and creates difficulty in understanding the scope of work. Further, in the absence of the detailed timelines there was no benchmark for monitoring the deployment of infrastructure.

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**2.4.3 *MSA did not incorporate the technical proposal submitted by SI***

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The SI was selected based on the evaluation of the technical proposals submitted by it. The technical proposal would ensure that there were no conflicts between the RFP documents and the technical approach proposed by the bidder. Audit observed that the technical proposals submitted by the SI were not incorporated as part of the MSA. Thus, commitments made in the technical proposal could not be ensured. Due analysis was not done at MSA preparation stage to study the technical proposal submitted by SI and as a result Department did not have control over supply of software and hardware components.

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**2.4.4 *MSA did not incorporate the bill of material as part of the Agreement***

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The contract included supply of hardware, system software and consumables. The commercial proposal of the SI contained a Bill of Material (BOM) indicating the quantity of items proposed to be used. The BOM submitted by the SI and the terms for regulating the execution of BOM items were not made part of the MSA. Audit noticed that in the absence of an agreed detailed BOM to be supplied, there was lack of clarity on the supplies to be made. For example, the technical proposal proposed 56 numbers of servers for the data centre, the financial proposal proposed 65 numbers of servers, the work order to TCS placed the number of servers to be supplied at 103 and the infra sizing document prepared by TCS estimated the required number of servers at 68. The Steering Committee permitted to deploy the servers based on the infra sizing document. Audit observed that Department procured (2016-17) servers and VMware virtualization software to form a VMware cluster to support the K2 infrastructure indicating that the servers deployed by the SI was insufficient.

Government stated (November 2021) that detailed BOM submitted by SI as part of the financial bid was taken as a reference. However, BOM submitted by the SI should have been scrutinized, third party audited and accepted and formally made part of the agreement. Proper scrutiny of the BOM and its inclusion as part of the agreement would have lent clarity on the contractual obligations.

#### 2.4.5 Penalties for delay in supply not incorporated

The contract involved supply of hardware, system software, consumables *etc.*, as part of the composite contract. However, there were no conditions for penalising the non-supply and delay in supply of the items. It was observed that the SI did not install the Geographic Information System (GIS) software, SLA monitoring tools *etc.*, which were to be supplied as a part of the agreement. However, due to the absence of penalty clause, the contractor was not penalised.

#### 2.4.6 Tolerable Central Processing Unit utilization threshold not specified

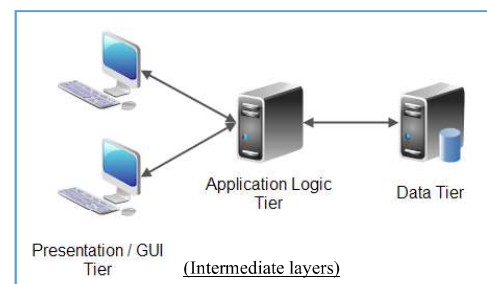
RFP stated that department gives utmost importance to the performance of the server systems proposed and deployed and SLAs would define the minimum performance requirements for the servers deployed, working in a combination of software and hardware. One of the indicators for determining the server utilisation is Central Processing Unit (CPU) utilisation and industry standards consider 70 *per cent* utilisation as a threshold. The RFP proposed to measure the server performance through simulation performed prior to deployment at the user acceptance stage and periodically during the production phase at non-office hours using load/stress testing tools and during real time using the Enterprise Management System (EMS) tools. This check was to be performed constantly to identify any deviations, and in case of deviations noticed, it was to be escalated immediately to the project director.

The threshold assigned is typically 60 to 70 *per cent* and indicates that if more than 70 *per cent* of the server machines' capacity is consumed, an SLA violation was required to be flagged. However, the CPU utilisation standard was not specified in the MSA.

Government stated (November 2021) that the RFP envisaged that application should be able to handle the estimated load as per industry standards and agreed that industry standard is <70 *per cent* CPU utilization. Government also added that if the CPU utilization crosses 70 *per cent*, then that might result in breach of other SLA's envisaged in the RFP. Audit noticed that K2 application became very slow and overall performance of the application was impacted. There were instances when server utilisation reached to 90 *per cent* level. And even though breach had occurred penalty clause could not be invoked as the RFP conditions were not translated into the agreement.

#### 2.4.7 Lack of clarity on application performance SLA metrics

K2 is a N-tier web-based application. N-tier web applications involve a presentation layer (seen and used by end user), a database layer (data storage-retrieval service) and intermediate layers which receive, process and respond to requests made by the presentation layer.



Considering efficiency and user attention span and user satisfaction, it is necessary that the web application responds quickly to the user. This requires that the application, database and server components are designed and

configured to deliver fastest response time. This requirement is specified in the form of performance SLAs. Audit observed that the server and application performance SLA metrics in K2 project were deficient. SLA criteria involve multiple factors (transaction volume, CPU utilization, response time ranges and number of users) and such criteria were not in place.

Service Level metrics were to be specified to regulate the performance under all possible ranges. The MSA specified application performance SLAs for Portal page loading time, when the transaction volume is equal to, or more than 5,000 number of transactions performed per minute over the Internet based application software. No criteria/performance requirements were prescribed to assess the performance for compliance when the number of transactions is less than 5,000. The method for arriving at the baseline of 5,000 number of transactions performed per minute for K2 application was not on record. Further, while time metrics were specified in averages, the base period for averaging and the method of computation was not specified. Specifying SLAs only for a particular range, and not the other possible scenarios resulted in lack of clarity.

Government stated (November 2021) that these SLA parameters ensure that SI configures the application to meet the application performance even at peak load, without causing any inconvenience to end users. Audit is of the view that the criteria for monitoring the application performance during normal course other than the peak load time should also have been made part of the SLA as in its absence there are no yardsticks to handle poor performance during non-peak scenarios.

## 2.5 Project milestones not revised

The project envisaged milestone-wise payments to the SI based on the progress of the project. The SI was to design and implement a detailed plan of action that sought to execute several activities in parallel, adopt critical path methods and commit additional resources to activities falling behind schedule so as to keep up with the overall deadline in implementation of the project. The payment request from the SI had to be referred to a committee headed by an external expert.

Audit observed that the project deviated from the milestones in its entirety and revised milestones were not set. Thus, the payments to the SI were not made against the set milestones. The milestones prescribed under the MSA are indicated in **Appendix 2.1**.

According to the MSA the SI was required to deploy a defect free K2 solution software at all locations by 70<sup>th</sup> week of project commencement *i.e.*, by 19 February 2013. The SI was to complete the end user training, deploy the SLA monitoring and measurement system using EMS and establish Call Centre Operations along with the automated solution for Call Centre operations. The O&M phase was to commence from 70<sup>th</sup> week. Completion of integration of all State Government departments with K2 and training of nominated officers of each department were to be completed by 122<sup>nd</sup> week.

Audit, however, observed that the project was not completed as of March 2020. As on the scheduled date of completion, even the preliminary milestone sign-

off from DoT on final FRS and SRS was not done. Audit also noticed that MSA was not revised to adjust missed timelines and deliverables.

The MSA came into effect on 18 October 2011 and was valid for a period of 382 weeks covering the pilot phase, roll out phase and continues till the completion of the O&M phase. The SI failed to adhere to the implementation plan and the timelines of the project was completely out of synchronization with the originally envisaged implementation plan.

According to MSA, roll out of all modules of application software and hardware at all Treasuries would be considered as the only benchmark for considering the project development to be complete before the O&M was to commence. The MSA did not provide for negotiating the timelines of overall Go-Live. The deviations in implementation schedule and resultant changes in the project milestones were not brought into the agreement by way of amendments. As a result, there was no legally binding timelines that would force the SI to complete the project expeditiously. This created an environment where slippages in timelines did not have any legal implications for the SI.

Thus, Audit observed that the contract clauses were not invoked to ensure the performance of the SI in line with the original terms of the contract. The process of ensuring the compliance with contract conditions was plagued by delays and inefficiencies. Delays at each stage coupled with poor monitoring as well as poor enforcement of contractual obligations resulted in prolonged non-compliance to the department requirements. The relaxations tilted the balance in favour of the SI and allowed the SI to remain insulated despite not addressing the performance requirements. For *ex.*, the SI often cited delays in the preparation of the SRS, for which it was solely responsible as evidenced by the discussions in the Technical Committee, for the project delays. The SI continued the operations on its terms with deviations which the department ratified through post-facto clearances either on its own or on the recommendations of the committee appointed to suggest future course of action. Neither the department nor the committee adopted a fact and contractual conditions-based approach in evaluating the performance of the contract. These decisions were merely based on the constraints of the project being further delayed and not being supported. The implementation of the project was, thus, rendered highly uncertain and uncontrolled.

Government stated (November 2021) that timelines were set for TCS to complete the activities as per Prof. Sadagopan Committee report<sup>6</sup>. The reply of the Government did not consider the fact that the scheduled time for development and deployment of the application as per the agreement was February 2013 and the Sadagopan Committee was constituted during 2018-19. There were no timelines for regulating the software development contract during the five-year period 2013-2018. Even the timelines recommended by

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<sup>6</sup> Government of Karnataka had constituted (2018) a Committee under the Chairmanship of Prof. S Sadagopan, Director, International Institute of Information Technology, Bengaluru to examine the SI proposal for change in project milestones and terms of the contract and to give its recommendations to the Government after due consideration of the progress made, status of the project and actions to be taken in the best interest of the project.

the Sadagopan Committee were not formalised by means of a supplementary agreement.

## 2.6 Contract Management

Audit observed that the Contract Management processes in the department lacked rigor commensurate with the scale, risks and values associated with the agreement as discussed below.

### 2.6.1 *Non-deployment of originally proposed key resource persons*

According to the tender conditions, there shall be no change of personnel proposed for the position of Engagement Manager for the K2 project in the bid from the time of the award of the contract till 153 weeks after the Go-live of the project. Similarly, there shall be no change of personnel proposed for the position of Domain Consultant as well as the software development team leader for the K2 project in the bid from the time of the award of the contract till 122 weeks after the Go-live of the project. The MSA stipulated penalty of ₹10 lakh for every resource changed.

The credentials of the key resources were one of the important criteria in evaluating the bids of the tenderers. The RFP recognised the importance of qualified and experienced professionals for the project as a critical success factor and 28 *per cent* of the weightage in technical evaluation of bidders was given to manpower. Therefore, it was important to ensure that the SI deployed the promised manpower to the project on the strength of whose experience the SI earned the award.

The Technical Committee noted that delay of 130 days in project implementation was due to the inability of the SI in deploying the key resources. Non-deployment of key resources in timely manner invoked penalty clause as per MSA which was not levied upon SI. It was also noted that the replacements proposed lacked the requisite qualification as stipulated in the RFP.

Government stated (November 2021) that there was a time gap from the day of submission of the bid till the award of contract. Audit noticed that the bid evaluation was based on the availability of the key resources and SI had entered into agreement without any amendments. Hence, the department should have enforced the conditions of the agreement.

### 2.6.2 *Non-submission of the project plan document*

According to the tender conditions, the SI was required to submit a Detailed Project Plan (DPP) for Design, Development and Implementation of K2 Solution at the time of entering into the MSA. However, the SI did not furnish the DPP and this was not made part of the MSA.

The Technical Committee had observed that failure to provide a DPP impaired the capability to measure the project progress in terms of milestones achieved. It was mentioned that in order to save time, the department finalised a DPP with support from a third party Project Management Consultant. The department allowed TCS to simultaneously develop the project plan and also document SRS for the Stage I modules. However, the DPP document submitted by the TCS was not made available to Audit.

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### 2.6.3 Enterprise Management System not established

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According to the MSA, the SI were to design, implement/customize a reputed EMS and develop any additional tools required to automatically monitor the SLAs. The SLA recording and reporting system implemented by SI shall be reviewed by a third party auditor who will certify the same. The SI shall ensure that the proposed EMS addresses all the SLA measurement requirements and calculation of applicable penalties as indicated in the RFP. The adherence to the SLA would be computed by the EMS tool implemented by the SI for this purpose. The credits and debits shall be calculated and the total gross amount of Quarterly Guaranteed Revenue (QGR) would be arrived at after deducting penalties, if any.

Audit observed that the SI did not set up the EMS as prescribed. This resulted in reduced capability of the department to monitor the software development and implementation, software performance.

Government stated (November 2021) that monitoring of devices and services was configured in the EMS tool. Audit noticed that configuration of the EMS was dependent on associated database for automatic monitoring of the SLAs.

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### 2.6.4 Penalties not imposed

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The MSA provided for levy of penalty for each week (six working days) of delay in achieving any of the milestones. The penalties were to be deducted from the monies due to the SI at the payment milestone. The timelines for each milestone were to be enforced independently, even though some of them were interdependent. This would have cascading effect of penalties for delays in all other milestones dependent on the precedent milestone. The RFP had, therefore, stated that the SI was to be extremely careful in establishing an excellent project management set up to avoid delays.

Technical Committee had attributed the delay of 244 days to the SI as follows:

- Delay of more than 52 days for failing to submit the requisite performance bank guarantee for the mandatory period of seven years as stipulated in the RFP.
- Delay of 130 days due to the inability of the SI in deploying the key resources *i.e.*, Engagement Manager, Domain Expert and Software Development Team Lead, proposed during the bidding process.
- Delay of 112 days due to the substandard quality of SRS documents submitted, reflected inadequate understanding of Treasury and Government functions, whereby the SI withdrew all the initial SRS submitted.
- Delay of 199 days caused by the SI on account of its failure to develop an acceptable project plan. The project plan submitted by TCS to the Department was unsatisfactory and suffered from deficiencies.

The Department also reported on the poor quality of SRS documents, the deficiencies in presentation like inadequate detailing, presenting incorrect information and inept description of processes, written against a total vacuum of understanding of the vision of the project, with other semantic deficiencies

such as use of inconsistent terminology, incomplete usecase and process flow diagrams resulting in sketchy, disconnected and fragmented pieces.

Audit observed that though the SI did not achieve even the first milestone of preparation and submission of SRS within the specified 11 weeks and the delay was attributable to the SI and poor quality of the deliverables, penalty clause was not invoked. Audit calculated the penalty for the delay in achieving the first milestone for the period from 12<sup>th</sup> week to the 37<sup>th</sup> week alone, which worked out to ₹3.00 crore<sup>7</sup>.

Thus, though stringent penalties were prescribed in the MSA for breach of milestones, DoT did not invoke the penalty clause to ensure the compliance to the achievement of the milestones. Strict timelines, obligations and penalties in the tender affect the cost, effort and risk perception of the bidders with impact on tender amount and this lenient handling of contract performance by the selected vendor runs against the spirit of the procurement process.

The Government stated (November 2021) that the delay on SRS preparation was attributable to both SI and the department. Audit observed that the Technical Committee (2012) had attributed the delays solely to the SI.

#### **2.6.5 Extension of maintenance contract even before completion of the original contract**

As per the original contract, the O&M phase would commence from the 70<sup>th</sup> week *i.e.*, after successful deployment of software solution across all locations and would be valid for a period of six years. As discussed earlier, the project milestones were not adhered to, and the application was developed on a piece-work basis rendering the original contract schedule outdated. Consequently, the O&M phase could not be determined.

It was observed that none of the modules were completed within the scheduled period of February 2013. A part of the Stage I comprising six modules were operationalised for the first time during September 2015. The remaining six modules were completed between 2015 and 2019. Pension Module of Stage 1 and none of the Stage II Modules were deployed in production during the original period of contract from October 2011 to September 2019. Thus, these 12 modules were out of O&M service. Despite this the department permitted the SI to treat the O&M period of first contract as completed by September 2019. Considering this the O&M phase should have been counted from at a minimum from September 2015 and extended up to September 2021. However, the department closed O&M phase in September 2019. Thus, the department lost the benefit of O&M for K2 by two years, due to delay in the development phase and parallel running of the O&M phase and made an additional financial commitment of ₹38.75 crore for the period 2019-21, as shown in **Appendix 2.2**. The department also had to procure system software licenses and maintain

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12 <sup>th</sup> week to 22 <sup>nd</sup> week (10 weeks) –	5,00,000* 10 =	50,00,000/-
22 <sup>nd</sup> to 27 <sup>th</sup> week (5 weeks)	10,00,000*5 =	50,00,000/
27 <sup>th</sup> to 37 <sup>th</sup> week (10 weeks) –	20,00,000*10 =	2,00,00,000/-
Total –		3,00,00,000/-

hardware which otherwise would have been the responsibility of the SI during the O&M phase.

The SI sought for revision of the rates for continuing the O&M operations after completion of the original term of the contract. The department entered into a revised contract at ₹125.44 crore for a further period of five years with support for application, Data Centre and Disaster Recovery Centre maintenance. The cost of revised contract worked out to 1.5 times the total price of the original contract (₹79.62 crore) and was more than 3.5 times of the original O&M cost (₹34.29 crore which was inclusive of helpdesk activities and maintenance of the infrastructure at district levels).

Government stated (November 2021) that the contract duration was set as per MSA and as recommended by the Sadagopan Committee. Audit noticed that the department lost two years of maintenance period at the originally agreed rates due to delay in development phase and concurrent running of the O&M.

#### ***2.6.6 Contract closure procedure not followed***

The department concluded the original contract during September 2015 and entered into a new maintenance contract. The new maintenance contract did not factor the incomplete development works of the original contract. The department did not follow the contract closure procedures as discussed below:

According to the procedure specified in Karnataka Public Works Code, the department was to make sure that all the deliverables are executed, and the department accept the document agreeing that the deliverables are done according to the requirements. The missing deliverables, if any, are identified and the contractor agree to work on these issues before the final delivery and closure of the contract.

The certificate of completion should be furnished by the officers concerned after the actual date of completion of the work. In case where it is not desirable to keep the contract open for carrying out minor incomplete items, the main contract is finalized after getting a supplementary agreement executed in the prescribed form by the same contractor for doing the residual work at his agreement rates.

During the final closure of the contract, the Contractor prepares a handing over report for seeking department's acceptance and approval. In Government, a project completion certificate is issued, and the final bill of the Contractor is prepared and finalised. However, it was observed that no completion certificate was issued, and deliverables were not formally taken over.

***The State Government should prescribe closure procedures for software development projects to secure the mutual acceptance of the project deliverables.***

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### 2.6.7 *The FRS and SRS requirements not monitored through a Requirement Traceability Matrix*

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The MSA required the SI to prepare and provide a Requirement Traceability Matrix (RTM). The K2 system developed/customized by SI would be reviewed and verified by the department against the approved functional requirements using the RTM developed by the SI. The acceptance testing against the functional requirements would be performed by independent third-party agency (external audit), as well as the select internal department users with the assistance of the RTM.

RTM is a document that maps and traces user requirement with test cases. It captures all requirements proposed by the client and requirement traceability in a single document, delivered at the conclusion of the software development life cycle. The main purpose of RTM is to validate that all requirements are checked via test cases such that no functionality is unchecked during software testing. It should contain the Requirement ID, Requirement Type and Description, Test Cases with Status mapped from RFP, SRS, SDD, Coding, Testing and final exit after knowledge transfer.

In the absence of a procedure to review the RTM periodically, audit could not confirm whether all the requirements specified in the FRS/SRS was finally brought into the application or not.

Audit also observed that RTM omitted change requests and did not cover features promised in high level technical document. Absence of a proper RTM led to department not being able to readily ascertain the tasks pending development from time to time in terms of requirements specified in the FRS.

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### 2.6.8 *Non-handing over of source code*

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Source code refers to the list of instructions that is written by a human programmer using programming languages such as C, C++, JAVA, *etc.*, and forms the recipe for a software application. Possession of the software source code is critical for security of the financial application systems, and it also allows the department to make subsequent modifications, fix bugs and roll out updates.

As per MSA, the ownership of the source code vests with DoT and it should have the total and exclusive intellectual property rights over the source code written for developing or customizing the K2 application. Further, the SI shall not use the source code in any other places without seeking permission from the department and without carrying out a basic sanitisation of the code. Upon completion of Go-live, the SI was required to submit the updated source code.

Audit observed that source code was hosted at TCS premises, Gandhinagar and not handed over to DoT. It was also observed that M/s. Price Waterhouse Cooper Cyber Security Team engaged by the department for strengthening cyber security reviewed the source code at TCS Office, Gandhinagar. Thus, the source code belonging to the State Government was held by the SI in its own premises without providing adequate access to the department for its review and utilisation in violation of the MSA.

Further, testing the source code as part of the procurement contract is important to ensure that source code could be used to build the application if required at a later stage. It needs to be verified whether it would be possible to build the application from the code on another system using a copy of the source code and if it is not possible, then the problems within the code needs to be identified and fixed. The Department did not furnish to audit the details of demonstration of the application which could be rebuilt using the source code *etc.* Hence, Audit could not vouch for the testing of the source code either by the Department or through an external agency.

Government stated (November 2021) that the source code was handed over to the Department during September 2019. The reply is not acceptable as the source code was still not available with the DoT but with the SI as there was no facility in the K2 data centre to securely store it. Further, the reports of handing over, its custody and the procedures in place to securely store the source code *etc.*, were not made available. Not having the custody of the source code impacts the ability of the State Government in securing envisaged level of strategic control.

***Since MSA conditions were not addressed in terms of ownership of the source code, it is recommended that the State Government should take appropriate measures to obtain the complete source code and maintain custody in a location controlled by it to ensure strategic control in the case of an unplanned exit and for use in capacity building.***

#### ***2.6.9 Non-assessment of Technology Stack resulted in vendor lock-in***

A systematic examination of the technology stack/technical architecture proposed by the SI for both benefits and adverse consequences forms a critical step in the implementation of the Project and would ensure that the impacts and the mitigation measures are considered in the project design with minimal damage to project and optimal use of resources. GoI guidelines on Treasury Computerisation and best practices require the departments to safeguard the Government projects from tech lock-in/vendor lock-in.

Audit observed that the technical architecture document proposed by the SI was not assessed by the Technical Committee for its dependency on proprietary software DigiGov. Even the Tender Scrutiny and Evaluation Committee merely stated that TCS solution is a custom developed software and did not deliberate on the dependency risk it would pose to the continuity of the software maintenance and operations in the eventuality of the SI exiting the project. The justification for employing a proprietary product (the specifications of which are not publicly known, whose patches and updates are not released on public domain and to which the department has no rightful access) in a highly significant critical financial application of the State Government was not on record.

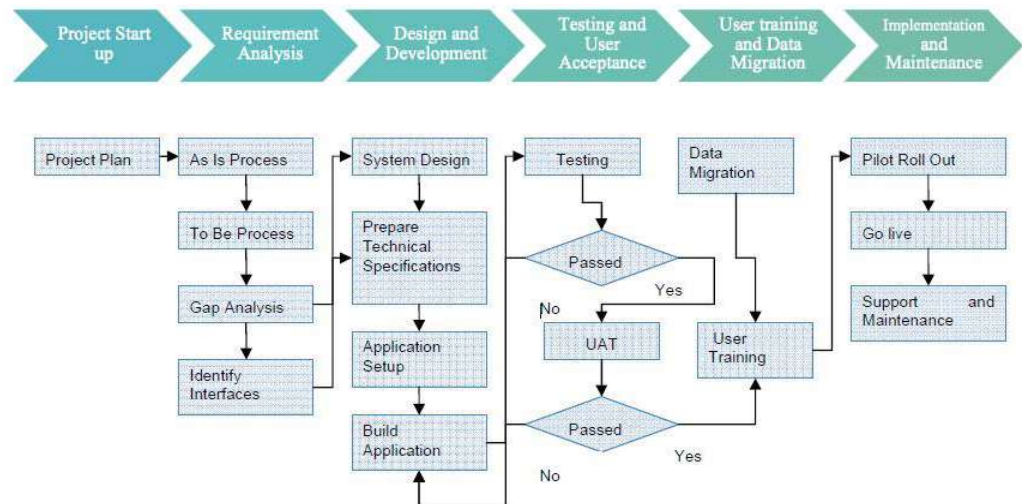
The impact thereof was that the vendor refused to provide design documents of the Workflow Management System and Application Security and Common Applications to the department which hampered the independent maintenance of the application and defeated the objective of strategic control envisaged in the RFP. The department was also forced to extend the O&M contract with TCS

for a further period of five years from September 2019 without inviting tenders after obtaining relaxation under the Karnataka Transparency in Public Procurement (KTPP) Act. Failure to critically examine the technical architecture proposed by the SI resulted in a vendor lock-in scenario for the project.

Government stated (November 2021) that the workflow engine is proprietary product around which the application was developed. The MSA provides for mechanism to safeguard against vendor lock-in. Audit noticed that the existence of a workflow engine, the suitability of its features to the K2 application development, the licensing conditions of the workflow engine *etc.*, was not considered while selecting the SI. MSA did not have any mention of this workflow engine. The absence of an Exit Management Plan coupled with lack of a well-defined data dictionary created dependency on the vendor for continued application maintenance.

## 2.7 Software Development

The project envisaged the following model for development of the software.



### 2.7.1 Delay in preparation of SRS and System Design documents and status of review of SRS by the Department

According to the project timelines, SRS for all modules was to be delivered before February 2012. However, the first SRS that of the Receipts Module was signed off during March 2013 *i.e.*, one month after the originally scheduled date of completion of the entire project. The SRS of nine modules were signed off between May and December 2013, eight between January to December 2014, two between January to December 2016, three during August 2018 and SRS for one module (Accounts Compilation) was signed off between December 2014 and February 2016.

Verification of the SRS documents made available to audit showed that 13 out of 27<sup>8</sup> SRS documents did not contain the details of having been reviewed by the Department. The SRS documents reviewed mainly related to Stage I modules which contained the functionalities related to K1. The House Building

<sup>8</sup> One Module (General Module) had 4 SRS documents.

Advance (HBA) Module was reviewed by only one official as against the requirement of three tier review.

Further, the sign-off from department on SDD, testing approach, test case and test plan documents was to be completed within T+25 weeks. The SDD was completed and signed off for 20 modules during July 2017, for one module (Expenditure Tracking) during October 2019 and for three modules (Fiscal Management, Non-Treasury Transactions (NTT) and Asset Liability Management (ALM)), the SDD was yet to be submitted by the SI. Audit observed that the Testing Approach/Test Case/Test Plan was not available in the SDD submitted. The module-wise status of sign-off of SRS, SDD and review of SRS by department is indicated in **Appendix 2.3**.

The Government stated that all SRS and SDD were submitted at time of closure of first contract for Stage I in 2019. The fact remains that as per MSA, the SRS documents, which were to be delivered by February 2012, was delivered after a delay of seven years by SI. This in turn resulted in delay in implementation of project as pointed out in paragraph 3.1.

### ***2.7.2 Deviation from Software Development Life Cycle model***

The MSA envisaged use of Software Development Life Cycle (SDLC) model, for software development and rollout, also known as Waterfall Model. All the modules were expected to be developed, tested, and submitted for user acceptance, third party certified, authorized for production and rolled out as an integrated package. However, the modules were developed in a piecemeal manner by the SI extending over a period of eight years affecting the integration, testing of the modules, user training, data aggregation and data migration.

The Department stated (August 2020) that they switched over from SDLC model to agile model. The agile development model requires close interaction between business users and developers. It was observed that the development team was located at Ahmedabad with domain experts stationed at Bengaluru which handicapped the methodology adopted. MSA and SLA provisions were not modified to reflect the change of development model from SDLC to agile. No documents were in place to support the change of methodology from SDLC to agile model such as the Technical Committee approval, tools to be used in implanting the agile model to validate the reply of the Department. On the contrary, it was observed that the Technical Committee advocated (March 2014) use of SDLC standards for development model.

Government stated (November 2021) that the application rollout was conceptualized to be waterfall model with all application modules to be ready as a pre-requisite. The roll out strategy was revised to agile model with staggered roll out of modules. Audit noticed that the change in development methodology demanded identification of tasks in detail, prioritisation of the tasks in a timebound manner. The change in development model from waterfall to agile was not made part of revised contract agreement.

### ***2.7.3 Deployment of application without Third Party Audit***

As per the MSA, the project was to be deployed live only after it was certified by the Third Party Auditor (TPA). The DoT would select an agency for

performing the audit over the K2 system. The third-party audit included monitoring the performance of K2 with a view to ensuring desired Quality of Service (QoS) by the SI. The TPA would review the entire array of deliverables produced by the SI for quality check and conformity to the requirements. The TPA would be responsible for concurrent audit of K2 Application, conducting User Acceptance Test (UAT) and Functional Compliance Audit, Security and Implementation Audit, Performance Testing and Penetrative Testing. SI was required to address all the gaps identified during the testing to the satisfaction of the DoT or its nominated agency prior to Go-live.

The DoT had engaged (January 2012) M/s KPMG as the TPA for the project for a consideration of ₹47.30 lakh and a MSA was signed. Payments were to be made as per the milestones prescribed in the MSA. An amount of ₹10.64 lakh was paid (April 2013 and December 2014) to the TPA, albeit with deviations from the payment milestones. Audit observed that the services of TPA were not available since 20 November 2015 as the contract was not extended. Notices were issued during December 2015 and thereafter the services were terminated on 6 April 2016. Consequently, all the modules developed subsequent to November 2015 were rolled out without TPA. The DoT failed to furnish to audit the copies of the TPA reports, action taken by SI and its acceptance by the department. Hence, audit could not ascertain the extent of work carried out by the TPA.

Further, no TPA was employed despite directions (April 2016) from the Steering Committee resulting in Go-live of K2 without TPA certification. This was highly irregular and resulted in deploying an unsafe system without testing. In view of such a significant deviation from the agreement, Audit could not derive any assurance on the authenticity and integrity of the transactions carried out through K2 application.

The Government stated (November 2021) that KPMG had conducted the Audit of K2 application software and IT infrastructure before “Go-Live”. The reply is not acceptable as the service of the KPMG ended in November 2015, no modules were ready in production as of November 2015. KPMG conducted audit of initial documents such as SRS and data centre infrastructure *etc.*

No other audits were commissioned with the mandate provided by the MSA to the TPA in terms of scope after the exit of KPMG.

#### ***2.7.4 Service Level Agreement monitoring system not deployed***

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The SI was required to deploy an SLA Monitoring and Measurement system and develop additional software and scripts to measure performance and generate SLA compliance reports. Further, according to the MSA, the payment during O&M phase was subject to successful demonstration of SLA measurement process/reports for the SLAs indicated as well as submission of all necessary operational reports as specified in the RFP. The SI was to implement any additional tools to record and report the performance indicators as detailed in the SLA matrix. The SLA reporting tools/process implemented by the SI was subject to third party review and SI was to address any issues identified during such third-party review for achieving the eligibility for this payment.

Audit observed that the SI did not deploy the SLA monitoring tools for enabling monitoring of the project implementation. However, the SI was paid ₹52 crore without ascertaining the achievement of the phase-wise project milestones. A case of SLA metric impacting the monitoring of K2 performance is illustrated below.

The MSA included an SLA for monitoring the portal page loading time on a periodic basis by accessing it from the data centre. The portal page loading time was to be routinely measured over a leased circuit or equivalent at a minimum 128 Kbps bandwidth shared between two users. All portal pages would be tested for performance and an average of the total time taken, calculated by dividing the sum of response times for all pages by the number of pages requested, would be considered for this SLA.

Response time at all Treasuries were to be monitored. The average response time would be calculated by dividing the total response time for all requests summed together by the number of requests made to the application system. The simulated queries would be executed on a periodic basis by accessing the reporting application from the data centre and the time thus generated would be used to calculate the SLA.

However, the SI did not implement any tools to monitor the application page loading time and response time at Treasuries from time to time. Help desk data captured also did not have categorisation for monitoring the incidents relating to slowness or poor performance of the Application. Though the Technical Committee discussed the slow performance of the K2 Application from time to time (January 2017/December 2020), such discussions were made without the aid of insights from the SLA data such as average page loading time, treasury response time *etc.* In the absence of adequate data, it was not possible for K2 management to determine the level and quality of service provided by the SI and to suggest measures for improvement and to monitor whether the suggested levels of improvements were achieved subsequently. While K2 engaged IBM for identifying the performance bottlenecks as discussed in **paragraph 2.7.6**, the levels of improvement achieved in practice could not be determined and reported in the absence of SLA measurement and reporting.

Government stated that SI has not configured all the SLA's envisaged in the RFP. Hence department has deducted applicable penalty amount from the bidder's payment. Audit noticed that the penalty clause for non-configuration of the EMS and SLA monitoring tools were not available in MSA. The department should have insisted on the execution of this component which was critical for monitoring the performance of the contract.

### **2.7.5 Training not imparted to Department personnel**

The success of an information technology-oriented project depends on the extent the end-user feels part of the entire process of transformation. Training was to be provided for various types of users from the level of super-user to the end-user level. Technical proposal submitted by the SI envisaged knowledge transformation to start on completion of the integration testing phase of the project and before sign-off of UAT.

The details of the training activity proposed for various users is indicated in **Table 2.3**.

**Table 2.3: Details of training activities proposed for various users**

Sl. no.	Category of user	Area of training	Whether training conducted or not
1	Treasury staff (Application Software Users)	Application software use	Conducted
2	Other department staff (DDO, CCO, CO, BEO, FD <i>etc.</i> ) (Application Software Users)	Application software use	Conducted
3	Core team of 15 Treasury Officers (In-house technical experts)	Technical training on RDBMS, Programming Languages, Operating Systems, EMS and SLA Monitoring, Security and Controls.	Not conducted
4	K2 champions (DTO Key officials, PMU members, Members of core group)	K2 IT Architecture, K2 life cycle, change management, application software, security <i>etc.</i>	Training conducted only on application software usage.
5	Policy makers (Decision makers)	Importance of K2 and process changes being brought in	Not conducted

Thus, training as envisaged was not conducted for the various users. The details of the claims made by the SI on training costs was yet to be furnished to Audit.

The SI had indicated ₹1.65 crore towards training costs and had proposed for designing the training courses and preparation of training materials based on the evaluation of training needs at different levels of the organisation across geographies. However, the documents relating to training need analysis prepared by SI and the documents relating to assessment/evaluation of the proposed activities such as assessment of trainers, feedback from trainees, training of master trainers and champion users were not made available to Audit.

The technical training on database and application handling, coding, EMS, Operating systems *etc.*, was not provided to the core team of the State Government. The Department did not build sufficient internal expertise to position itself in a competent and advantageous position of understanding the Project for enabling it to independently select a replacement partner through competitive tendering. Consequently, the contract was extended based on the terms and conditions and rates proposed by the SI after seeking exemption under the KTPP Act.

Government stated (November 2021) that detailed trainings have been conducted on Project Life Cycle, Change Management, BPRs, Application software, Security, *etc.*, through e-Governance - National Institute for Smart Government (NISG). Audit noticed that imparting training was the responsibility of SI according to MSA and not of e-Governance - NISG.

### 2.7.6 Engagement of IBM Accelerated Value Program and Red Hat Professional Services

According to RFP, the broad sets of responsibilities of the SI were development/customization and deployment of K2 system, providing IT infrastructure for the System and its maintenance including disaster recovery, performance maintenance of the application, user training for Government users and other stakeholders, system administration/operations training to the select employees of DoT, helpdesk services/helpdesk support *etc.*

The SI was responsible for timely upgrades and patches of operating system and firmware; regular performance tuning and monitoring of the system (application and database) to enhance its performance and comply with SLA requirements on a continuous basis. All these preventive measures form part of the overall responsibility for maintenance of K2 by SI.

Audit observed from the agenda and notes of the Technical Committee (TC) meetings that the system experienced frequent database downtime and poor application response, frequent deadlock, database lock not getting released and CPU utilisation exceeding 90 *per cent.* To overcome these problems and help in resolving application performance issues and reduce downtime of the application/portal, the department decided (January 2017) to employ IBM Accelerated Value Program (AVP) at a cost of ₹90 lakh and Red Hat Professional Services for preventive maintenance at a cost of ₹29 lakh. The agencies were to provide support for maintaining the application performances to the desired level.

As these were the responsibilities of the SI, engaging separate agencies to address these issues indicate the lack of expertise deployed by the SI. This also resulted in avoidable expenditure of ₹1.19 crore and extending undue benefit to the SI. Interestingly the PMU for the project apprised the TC that the support under O&M was “limited only to resolving issues related to the product; the support arrangement provided by SI was for reactive support only; and K2 being a critical financial application needs proactive support from Red Hat Professional services”. Such an interpretation by PMU was not in conformity with the provisions of the MSA.

Government stated (November 2021) that while SI has implemented the solution, there has to be a review of the deployed solution by a third party to ascertain that the solution implementation is compliant with the best practices. Hence, Red Hat professional services and IBM AVP support services were taken by the department to ensure better security and performance of the application. Audit is of the view that the scope of the work assigned to the IBM was not in the nature of third-party review but included knowledge transfer, upgrade planning, performance tuning *etc.*

## 2.8 Change Management

The MSA specified the procedure to be followed in the event of any proposed change to the Agreement, Project Implementation Phase, and Operation and Management of SLA. Accordingly, change requests would emanate from the Project Managers of the parties to the MSA. Change Control Notes (CCNs)

prepared by Government/SI will be presented to other Party's Project Manager who will acknowledge receipt by signature of the CCN.

### **2.8.1 Software Change Management**

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As per the RFP, the SI shall define the Software Change Management and Version control process and obtain approval for the same from the department. For any changes to the software, the SI was to prepare detailed documentation including proposed changes, impact to the system in terms of functional outcomes/additional features added to the system, *etc.*, and obtain approval from the department for the proposed changes before implementation into production environment. Such documentation is subject to review at the end of each quarter of O&M support. Audit observed that though there were several changes in the SRS and SDD, these were not approved by the Technical Committee.

Further, the application software shall be version controlled adopting the industry standard practices like Version Control System (VCS), Source Code Management System and Software Configuration Management (SCM) and the System shall permit the latest versions of the application. Audit observed that the VCS, Source Code Management System was not in place and SCM was incomplete as it omitted software component of reports generation.

### **2.8.2 Configuration management process not in place**

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The MSA envisaged that K2 should have the ability to track changes in configurations of the system components and the SI was responsible for the daily maintenance of the configuration. The configuration management involves identifying and labelling the configurable items, taking measures to protect the configurable items, establishing a baseline for the configurable items, keeping a record of the configurable items (date of release, locations of the configurable items, proposed changes to them *etc.*). The configuration items are regularly checked and audited in order to ascertain they are in consistent state. The process of identification, auditing, reporting and approval *etc.*, needs to be documented.

Audit noticed that K2 did not have a configuration management<sup>9</sup> plan in place to manage continual enhancements of the application. The Project also did not have the updated system support documentation reflecting the changes since the original release of the application. Up to date documentation is required to effectively support the application and ensure that key application knowledge is not lost. This is particularly important to K2 as fixes and enhancements to the application are made by the SI.

### **2.8.3 Inadequate documentation in Change Control Notes**

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Volume III of RFP states that the Project Director, K2 and the SI recognize that frequent change is an inevitable part of delivering services and provides a format for floating a CCN with three parts Part A – Initiation, Part B – Evaluation and Part C – Authority to proceed. The RFP also refers to the use

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<sup>9</sup> Configuration management is a process for maintaining computer systems, servers, and software in a desired, consistent state. It's a way to make sure that a system performs as it's expected to as changes are made over time.

of CCNs for performing any functional changes to the system. The CCN and its approval process is an instrument to manage and control changes. The format for CCN considers the need for recording details of the change such as reason for change, a description of the change, brief description of the solution, *etc.* It also provides for numbered attachments to support the CCNs. For *ex.*, CCN no. BC 11 records the following information:

Description of change:	Disabling Notification feature from "Fund release by AD to Group of DDO" and "Fund Release by CCO to Group of DDO" in cases where group of DDO comprise of more than 500 DDOs
Change Reason(s):	While releasing funds to a Group of DDOs which has many DDOs, file was not getting approved as system was unable to send notification to such large number of users. After discussion with the Department, it is decided that notification feature can be disabled in case the group of DDOs comprise more than 500 DDOs. This will help improve performance of this process.

However, a review of CCN documents provided to audit showed instances where the justification of changes was not recorded in sufficient detail. While the reasons for change in Part A was recorded as 'Requirement raised by PMU/Change based on discussion with PMU team', the brief description of the solution and impact in Part B was recorded as 'As explained in description of change in Part A'. A few illustrative instances are indicated in **Appendix 2.4**. Recording such reasons creates a situation of relying on the ability of the concerned PMU staff to recollect the reasons and context during later reference and details not being available when change in PMU staff occurs. Similarly, inadequate documentation of the description of the solution and impact of the change reduces the visibility of the fix / change at a later date.

## 2.9 Helpdesk Management

The primary objective of Helpdesk is to provide a single point of contact for all problems, issues, requests and queries coming from the client environment and that associated information is maintained and reported in accordance with SLA. Helpdesk should register reported problems, assign trouble-ticket to concerned technical staff, track the resolution of trouble-tickets and prepare reports for analyzing components of the IT infrastructure more prone to failure. SI also proposed to configure the EMS to automatically detect certain incidents. Processes and Strategies for the resolution of trouble-tickets, either reported by end-users or automatically detected by EMS were to be in place.

### 2.9.1 *Incomplete data on tickets raised*

Audit observed from the information furnished (**Table 2.4**) that the number of tickets for registering complaints increased from 3,114 in 2015-16 to 17,275 in 2017-18 and decreased to 2,520 during 2019-20. The information furnished was, however, incomplete as there was a total of 1,60,925 gaps in the ticket serial numbers during the period 2015-16 to 2019-20.

**Table 2.4: Statement showing the number of tickets raised and gaps**

Sl. No.	Year	Total Tickets raised	Number of gaps observed in the data	Total
1	2015-16	3,114	5,601	8,715
2	2016-17	15,140	36,227	51,367
3	2017-18	17,275	38,961	56,236
4	2018-19	15,020	23,724	38,744
5	2019-20	2,520	56,412	58,932
	<b>Total</b>	<b>53,069</b>	<b>1,60,925</b>	<b>2,13,994</b>

Source: Data furnished by Project Management Unit

The reasons for the sharp decline and for the gaps were not explained to audit.

### 2.9.2 Incomplete database

Categorisation of data - The data in helpdesk was to be classified under a three-tier categorization to facilitate proper analysis. This three-tier classification was not available for 36,735 tickets.

Root cause for incidents - The helpdesk data contained a field to record the root cause for an incident. This was empty for 20,641 tickets.

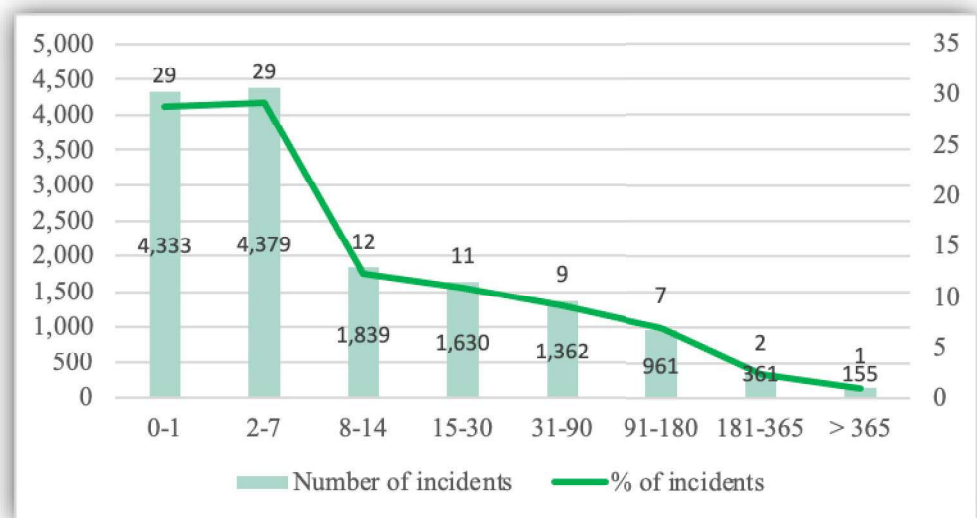
Originating department – The field for capturing the name of the originating department was empty and recorded as ‘others’ for 49,607 and 12,653 tickets respectively.

Such gaps affect the quality of the helpdesk data and its ability to provide useful insights for proactive maintenance of the application including need for changes in the application, user training *etc.*

### 2.9.3 Resolution of tickets after specified time

The RFP specified the average resolution time for problems recorded at help desk for various categories, the minimum being <4 hours (problems related to user understanding of K2) and maximum <15 hours (problems related to local infrastructure at sub-treasuries). The time taken were to be recorded using help desk tools and application performance monitoring tool. The time taken beyond the prescribed limits would be considered as a breach.

Audit observed that the help desk metrics were not computed and reported to the PMU by the SI. The data furnished to Audit did not indicate the time of closure of tickets except for the year 2018-19. Hence, the resolution time and delays thereon could not be computed and analysed for the entire audit period. Analysis of the data for the year 2018-19 showed that 71 *per cent* of the incidents reported upon were closed after the breach of the specified resolution time as indicated in **Chart 2.1**. It can also be seen that 155 tickets were resolved after more than a year.

**Chart 2.1: Time taken for resolution of tickets during 2018-19**

Since the exact time of closure was not available, Audit could not match the time of resolution in terms of number of hours.

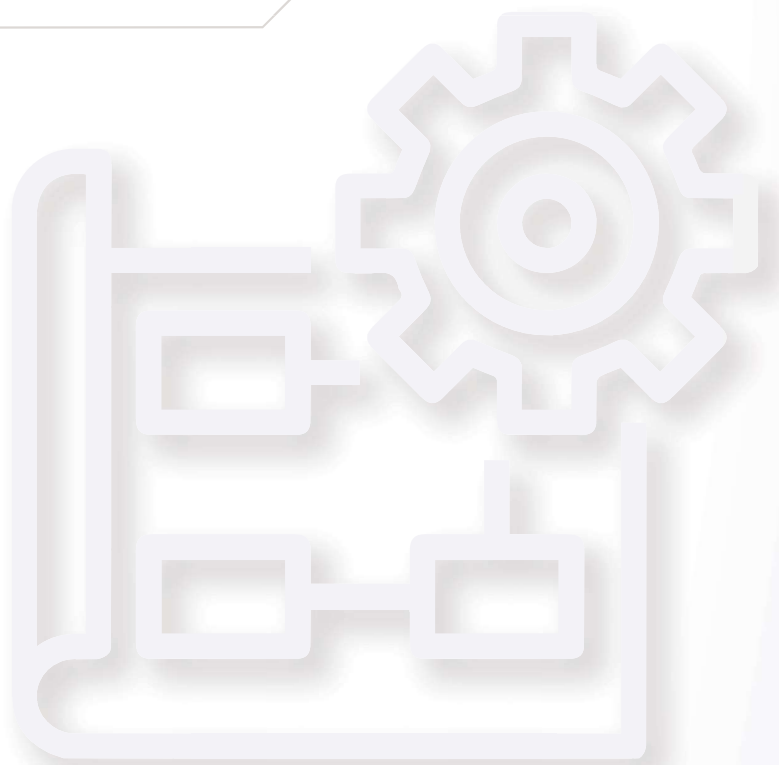
Audit also observed that the helpdesk unilaterally declared the resolution of ticket raised by users. In 2019, 31 *per cent* of tickets were marked as closed without recording the action taken. There was no facility available to obtain feedback on resolution of the ticket from the originators. The only way for a ticket originator to inform the non-resolution of the complaint was by raising another independent ticket which was not linked to the original ticket. In the absence of a feedback mechanism, the effectiveness of the helpdesk functionality was not independently verifiable by audit. The department did not furnish the details such as monitoring of helpdesk activities, number of change requests initiated based on analytical reports submitted by the helpdesk, EMS configured to facilitate the automatic identification of the critical incidents *etc.*



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# **Chapter III**

## **Project Implementation**





# 3

## Chapter

# Project Implementation

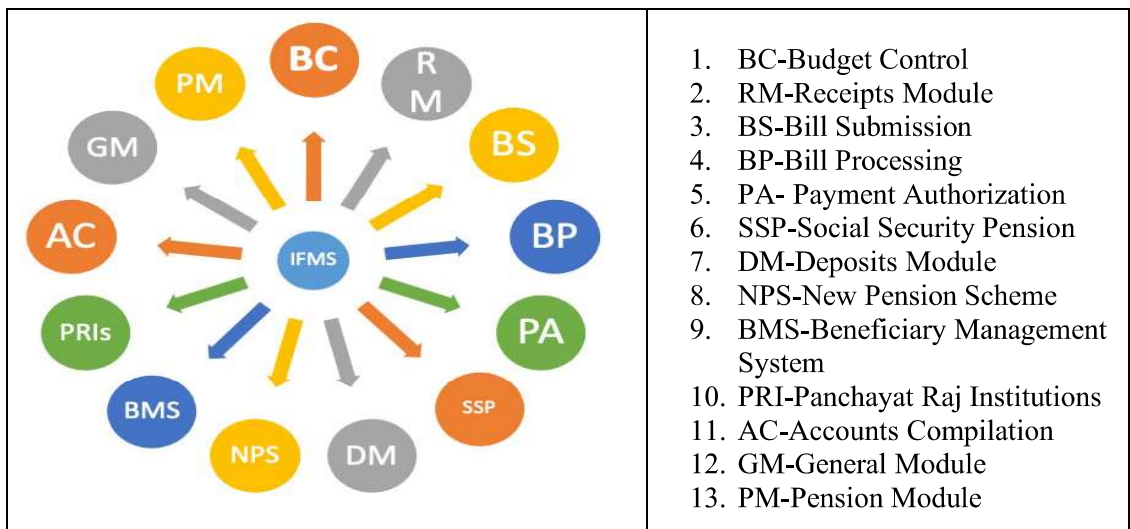


### 3.1 Status of the Modules

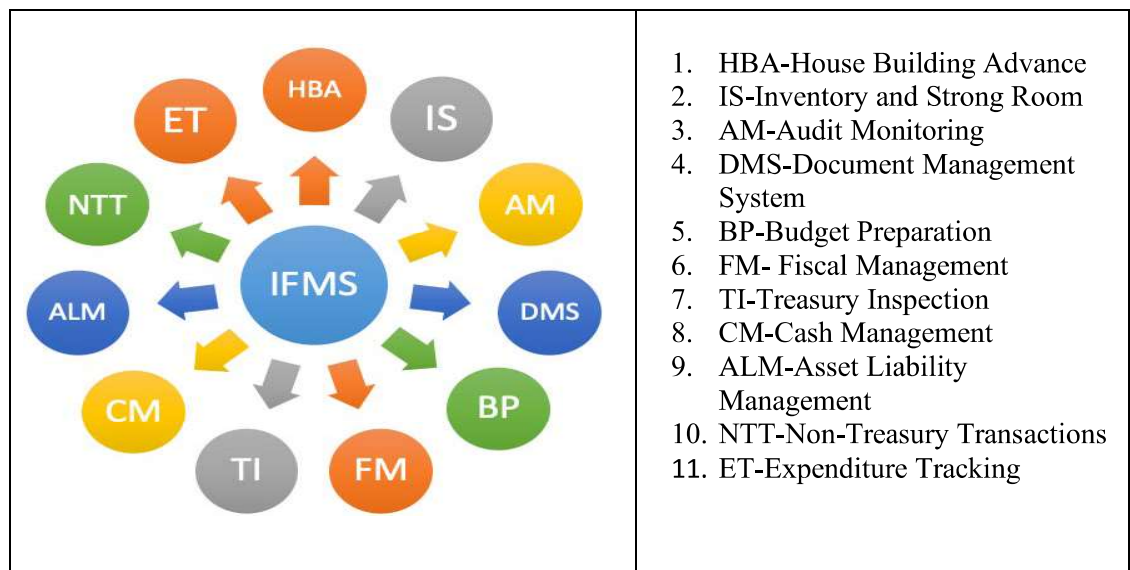
The K2 application comprises of 24 modules and was proposed to be implemented in two Stages. Stage I comprised of 13 modules and Stage II consisted of 11 modules as shown below.

**Chart 3.1: Stage I and Stage II modules**

**Stage I:**



**Stage II:**



Audit observed that 22 modules were being implemented at present (13 modules of Stage I and 9 modules of Stage II). Further, six out of the nine implemented modules of Stage II were not in use and two modules were yet to be developed. As a result, K2 project is yet to achieve all of its intended objectives and expected outcomes even after more than a decade since its conception.

### 3.1.1 Delay in implementation

According to the implementation plan in the MSA, the K2 Application was to Go-live<sup>10</sup> on 18 February 2013. The Stage I modules were to be completed by 4 July 2012 followed by Stage 2 modules by 10 October 2012. Stage I modules was to bring all K1 functionalities into K2 Application and Stage II modules would bring in additional higher-level capabilities into K2 system. K1 was proposed to be de-commissioned after the roll out of Stage I module during July 2012.

However, none of the Stage I modules were completed as per schedule. The SI deployed the six modules of Stage I by September 2015. The development of the other six modules of Stage I *viz.* Receipts Module, Social Security Pension, Deposits Module, New Pension Scheme, Beneficiary Management System, Panchayat Raj Institutions were rolled out during the period 2015 to March 2020.

Further, it was observed that modules were launched before developing the complete functionalities. Out of the 939 identified functionalities of Stage I modules, 665 functionalities were in working state and 274 functionalities were yet to be made operational. The status of the functionalities module-wise for Stage I and Stage II is shown in **Appendix 3.1**.

The independent modules of the K2 would be able to collect and exchange data with each other only if they were deployed concurrently. Accordingly, MSA envisaged completion of both the stages within 51 weeks and commencement of O&M only after both the stages were completed.

Development and Deployment of the Stage II<sup>11</sup> modules *viz.* Expenditure Tracking Module, Cash Management Module, Fiscal Management Module, Asset Liability Management Module, Treasury Inspection, Audit Monitoring, Non-Treasury Transactions Module were to add higher level decision support

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<sup>10</sup> Go-live is referred to the completion of the entire development and deployment processes, along with user acceptance testing and third-party audit, across all treasuries, a one-month acceptance period for verifying adherence of all conditions and subsequently a two month stabilization period for meeting all the SLA conditions. The operational support and maintenance services would commence from the “Go-live” date for overall system stabilization, software maintenance, IT infrastructure (hardware and network) solution maintenance, system administration, security administration, database administration, LAN administration, LAN-WAN link administration and end-user problem resolution. The Operational Support shall be provided for a 6 year period from Go-live.

<sup>11</sup> These were also part of the minimum deliverables specified under treasury computerisation project of GOI. According to the Guidelines on Treasury Computerisation, the States would be free to decide their plans but would need to factor in minimum deliverables with regard to functionality, connectivity, service delivery and standards. The budget preparation, expenditure tracking and CAG interface module, financial data warehouse module, fund management module *etc.* were part of the indicative minimum deliverables under the GOI project.

capabilities to K2 Application as shown in **Appendix 3.2**. It was observed that none of the Stage II modules were completed within the scheduled period.

As a result, the K2 Application remained as a transaction processing system devoid of the envisaged decision support and business intelligence capabilities even after nine years of the project commencement.

### **3.1.2 Budget Preparation Module discarded**

K2 Budget Preparation Module envisaged building automated capabilities to help in preparation of both the State and District sectors budget through creation and maintenance of a database of all Budget Estimating Officers (BEO), District Level Officers (Controlling Officers) and Drawing and Disbursing Officers (DDOs) and their responsibilities in preparing the budget.

Abandoning this module created a gap in the automation of the budget management. The budget preparation module was to provide input data to the budget control module. In the absence of this module, budget data continued to be fed through back-end operations and manual interventions which poses a risk on the integrity of the budget control data. Further the absence of data on the budgetary demands raised by the DDOs, the amount received against their demand, actual allocation, actual releases and expenditure were not amenable to analysis.

The Government stated (November 2021) that the FD decided not to adopt the Budget Preparation Module. Audit is of the view that by not correlating the budget projections with allocations and expenditure, the transparency<sup>12</sup> in budget preparation process is impacted. The Government should, therefore, deploy the module on priority.

### **3.1.3 Expenditure Tracking Module not utilised**

The Expenditure Tracking Module was to assist the decision makers within the Government with financial details under various project, scheme or institution wise. These details were to be used to identify the status of a project and the expenditure incurred and objectives achieved. The module was to capture the details of works/projects/schemes/institutions within the Khajane system and map it with all receipts and payments, such that stakeholders can identify the progress of the project with respect to the expenditure done against each. The module would also capture the Government Orders (GOs) related to works/projects/schemes/institutions. A unique project/scheme/institution ID would be allocated to track all transactions done against that project, scheme or institution.

Non-deployment of the module thus impaired the capability of the K2 to support the stakeholders with relevant information on the progress of the works/projects/institutions *etc.* For example, K2 was not in a position to provide expenditure on K2 project over a period as no specific ID was assigned to the K2 project and the bills drawn towards K2 expenditure was not mapped. Similarly, all the work bills were to be passed through the K2 System. However,

<sup>12</sup> Code of Good Practices on Fiscal Transparency adopted by the International Monetary Fund in 1998. India was a member of the Interim Committee which discussed this code and was represented in the Committee when the Code was adopted.

the bills were passed as DC Bills. The Expenditure Tracking Module proposed to link the work bills across multiple years by assigning a work code. Since the module development was delayed, it was not possible to track the expenditure on a particular work. Thus, even though granular data is available, it could not be aggregated, monitored and tracked in the absence of deployment functionalities envisaged in the Expenditure Tracking Module.

***The Expenditure Tracking Module should be implemented on priority to enable the tracking of projects, works, recurring payments etc.***

## 3.2 Integration

The system integrates with other financial transactions of the external stakeholders such as Reserve Bank of India, Accountant General (Accounts & Entitlement), Agency Banks, Post Offices, Central Plan Scheme Monitoring System and internal stakeholders like HRMS, Directorate of Social Security Pension and other departments, to enhance the capability of preparation and reconciliation of accounts by FD.

### 3.2.1 Strategy for integration was not in place

The DPR for K2 considered integration as an essential element of the Application. Accordingly, the State Government was required to prepare a strategy to integrate State Service Delivery Gateway, State Portals, State Data Centres and Common Services Centres being set up under the National e-Governance Plan and other external agencies. It was observed that there was no strategy in place for integration. The DPR of K2 also envisaged preparation of a roadmap for integration with external entities. Data exchange with external agencies required a preliminary study of the existing applications with which integrations were planned to understand the type and structure of data. Audit observed that preliminary study was not undertaken to identify the functionalities available in the external applications. As a result, the FRS could not specify the integration requirements with other applications to permit effort estimation by the bidders.

According to the MSA, the integrations were to be completed by 19 February 2014. Audit observed that the e-procurement portal was not linked with K2 for capturing the project details, work details *etc.* The Police Information Technology (Police IT) system was not integrated for capturing the data pertaining to the Police Department. The K2 was yet to be integrated with Accountant General (Accounts & Entitlement) for the online exchange of voucher level data and reconciliation of accounting transactions. Further the integration with planning department, expected to aid in the real-time tracking of utilization of fund was not undertaken. Absence of integration with planning department impact the monitoring of timely transfer and utilisation of funds. Integration of K2 with HRMS to allow real time exchange of employee information was incomplete.

The delay in integration impacted the exchange of information with the stakeholders. To cite one instance of the impact of non-integration especially with AG, there were delays in submission of monthly accounts as it continued to be transmitted through manual methods by the individual treasuries. The

extent of delayed submission of monthly accounts to AG increased from 27 *per cent* in 2014-15 to 51 *per cent* in 2019-20, the delays are being up to 15 days.

The Government stated (November 2021) that deployment and development of integrations is an ongoing process. The Government response is not acceptable as external integrations were part of the MSA and it should have been completed in a time bound manner by SI. The absence of integration, thus, defeated the objective of system-to-system exchange of information to the major stakeholders.

***The department needs to determine a timeline for completing the integration processes with important applications like e-procurement, HRMS etc.***

### **3.2.2 Integration with Public Finance Management System**

GoI launched the Public Financial Management System (PFMS) in April 2008 aimed at establishing a suitable online Management Information System (MIS) and Decision Support System (DSS) for fund management of the schemes of the GoI. The PFMS system *inter alia* envisaged tracking of disbursement and utilisation of GoI funds under various schemes on a real time basis. The PFMS facilitates monitoring the funds devolved to Consolidated Fund of States and obtaining real time expenditure information for schemes for which funds are transferred from the Central Ministries.

GoI guidelines on Treasury Computerisation and FRS of K2 envisaged automatic integration of K2 with PFMS to exchange data such as sanction order information, receipt of funds and expenditure. These aspects were part of the NTT Module of K2. It was, however, observed that due to delay in deployment of NTT Module, K2 was not integrated with the PFMS till the year 2020-21. As a result, the State Government was manually uploading the data related to the implementation of the central sector schemes to the PFMS.

The Project Director stated (February 2021) that the integration document for automation of the process had been finalised in consultation with the PFMS authorities and is under development. The State Government stated (November 2021) that the NTT Module was developed and operationalized and integration with PFMS was in place. The fact remained that the delay in implementation of the NTT module and consequent delay in implementation of the integration with the PFMS deprived the State Government of a tool for capturing the master and transaction level data and real time monitoring of the progress of central sector schemes.

### **3.3 Envisaged data analytic capabilities not built**

One of the key objectives<sup>13</sup> of K2 is to produce financial data that is relevant to decision making. K2 gathers large volume of financial data from various sources as part of its business transactions. According to the RFP, the SI should create an Online Analytical Processing (OLAP) system within K2 which should

<sup>13</sup> The Guidelines on Treasury Computerisation envisaged a Financial Data Warehouse functionality where data from all modules is processed on a central server for generating various MIS reports covering up-to-date financial information across departments, budget, ways and means position, payment data, receipt data, and bills in process *etc.* It would provide a multi-dimensional query support based on various financial parameters.

provide a facility to perform historical analysis over backed up as well as live data to help in generating trend analysis and have capability to perform forecasting. The SI was to explore the possible use of Business Intelligence (BI) and provide Decision Support System (DSS) for various functions of the department and should be able to project a comparative analysis of expenditures and accomplishments, using statistics gathered from non-Khajane sources.

The data analytics capability as envisaged was not developed in K2 which limited the capacity of the application to support senior management by providing roll up, drill-down reports. Analysis of the data across the years, trend analysis reports, data analysis across K1 and K2 *etc.* was not facilitated.

The Government stated (November 2021) that the reports incorporating historical data and leveraging trend analysis, business intelligence and forecasting were yet to be developed. Since MSA stipulated development of these reports by the SI, department was required to enforce its execution, which was not done. In absence of data analytics and trend analysis, DSS and BI could not be achieved, which impacted decision making.

### ***3.3.1 Geospatial Analytical capability not built***

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According to the FRS, the bills for major works/projects, schemes and grant-in-aid institutions should be with reference to the unique code assigned at the registration stage. MIS reports for tracking expenditure at periodic intervals and with reference to geographical locations were to be made available.

Accordingly, the technical solution proposed by TCS provided for integration of GIS with the modules of K2 to build a cohesive Information and Communication Technology (ICT) system along with an effective decision support system. Integrating both the systems will bring a powerful synergism allowing users to become more productive, improve business insight and provide the adaptability necessary to accelerate business strategies.

It was also observed that though K2 has created a repository of location information from hamlet level to State, the geospatial reporting capability was not built. As a result, analysis of expenditure across villages, taluks, districts and regions was not available in K2.

***The Government may ensure that the K2 build functionalities capable of providing trend analysis and dynamic reporting leveraging the power of historical data captured.***

### ***3.3.2 Data digitisation and migration of K1 not achieved***

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According to the agreement, the SI was required to prepare a strategy for data migration and digitization with the consent of the department. The SI was responsible for migration from K1 to K2 and also the historical data on the State Finances from the year 1991 onwards, which was available with the Finance Department.

K1 was proposed to be de-commissioned after the completion of Stage I modules and completion of data migration. K1 application continued to be in use for financial transactions even as of March 2021 in the State as shown in **Table 3.1.**

**Table 3.1: Statement showing the payments processed through K1 and K2***(₹ in crore)*

SI No	Financial Year	K-1		K-2	
		Number of Vouchers	Amount	Number of Vouchers	Amount
1	2015-16	41,01,142	1,65,766.70	25,992	148.86
2	2016-17	36,64,571	1,69,419.35	5,96,260	13,783.58
3	2017-18	33,71,893	1,66,860.48	6,05,664	39,208.54
4	2018-19	28,08,578	1,17,459.36	10,20,932	1,17,651.79
5	2019-20	14,20,520	51,296.28	25,19,973	1,92,447.87
6	2020-21	92,203	4,164.87	40,34,101	2,53,646.68

Source: Information furnished by the department

As a result, financial information was captured in two independent databases. Delay in Stage-I Modules and consequent non-retirement of the K1 Application resulted in continued parallel use of K1 application in the treasuries resulting in silos of databases capturing data in different formats. The absence of K1 data migration impaired the capability of K2 to provide comprehensive financial information. It was observed that the SI did not undertake the migration of data from K1 though it was part of the contract.

The Government stated (November 2021) that the entire transactional data of K1 would be archived on separate servers for quick and easy retrieval of data for generation of reports and also stated that common aggregate views combining K1 and K2 data would be developed for creating financial reports across the years. In the absence of concrete timelines for migration of data from K1, and prolonged capturing of financial information in two different silos of databases coupled with non-migration hinders the use of data for trend analysis, data protection and hardware maintenance *etc.* Data Digitisation and Migration, which was an important aspect of the MSA remains to be executed.

### ***3.3.3 Generation of cash book and other subsidiary registers not achieved***

The Guidelines on Treasury Computerization envisaged provision of computerised cash book as part of the accounts module. K2 Application capture the entire data related to receipts and disbursements for a particular DDO and information needed for the maintenance of cash book and required registers. However, the system does not provide a facility for preparation of the cash book for the DDO. Thus, the capability of K2 was not adequately utilised to reduce the manual recording of financial transactions by the departments.

As a result, the DDOs continued to maintain the manual cash book and were facing difficulties in recording the receipts and payments as they did not have authentic information on the transactions taking place through K2 with reference to the various receipts and payments. For *ex.*, the DDO is aware of submission of salary bills to Treasury but not the details of the actual disbursement to the employees' accounts. The recording of salary disbursement in the manual cash book was therefore a challenge requiring collection of information through manual efforts.

The Government stated (November 2021) that cash book was not in the scope of the K2. Since cash book was part of guidelines, audit is of the opinion that

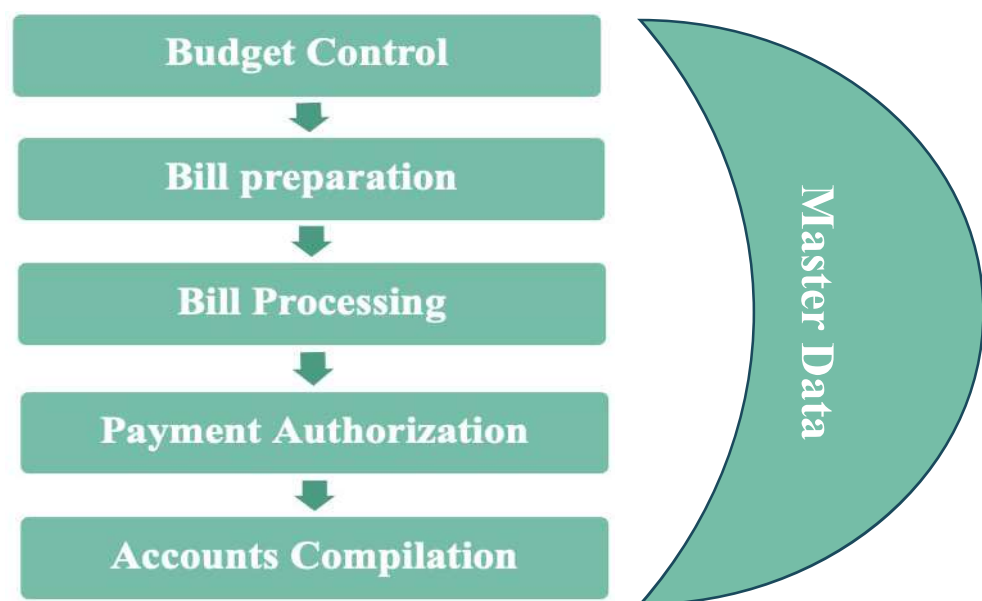
provision of a cash book could have avoided the manual maintenance of the cashbook.

*The Government may ensure that K2 provide a cash book and other digitised financial documents to fully utilise the data captured by the system to avoid duplication of efforts.*

### 3.4 Modules selected for test-check

The Performance Audit covered six out of twelve modules in operation as of March 2020. This covered the core modules which were rolled out in K2 production during September 2015. The relationship between the modules is indicated in **Chart 3.2**.

**Chart 3.2: Relationship between the modules selected for test check**



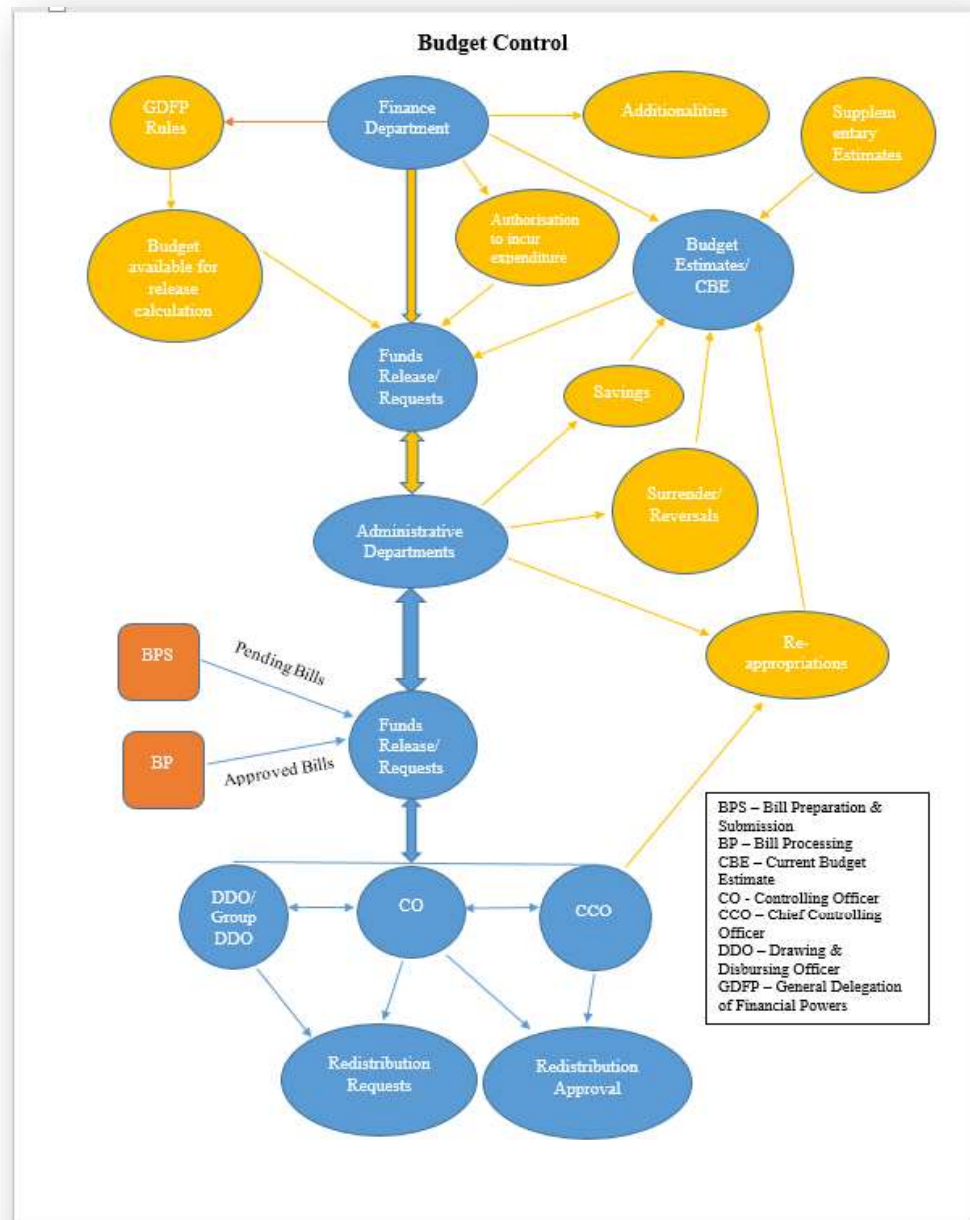
These modules cover the lifecycle of a payment transaction. The payment from the Government account is initiated when a claim is received against the Government towards work done, service rendered, article supplied *etc.* The amounts are drawn from the Consolidated Fund of the State against an allotted budget. The claims are processed by the designated DDOs against this allotted budget. The DDOs prepare bills in prescribed formats in the Bill Preparation & Submission Module (BSM). The approved bills are forwarded to the Treasury along with supporting documents and the Treasury processes these bills in the Bill Processing Module (BPM). The bills after verification and acceptance is forwarded to the Payment Authorisation Module (PAM) for final approval. The PAM generates voucher number to the bill and the payment advice. Payment scrolls are received from the Bank and these are processed and accounted in the Accounts and Reconciliation Module (ARM). Compilation Section of the Treasury prepares and sends the various reports to the Accountant General (A & E) based on the information generated by the ARM.

The module wise findings are discussed in the succeeding paragraphs.

### 3.5 Budgetary Control Module

A detailed flow chart explaining the budget control process is indicated as **Chart 3.3**. The amount of expenditure that can be incurred from the Consolidated Fund of the State is strictly controlled by the Legislature. The Appropriation Act authorises the Government departments to spend money on such items as determined under the Act. The funds made available are actually drawn and spent by the DDOs who function under the Controlling Officers (CO) and Chief Controlling officers (CCO).

**Chart 3.3: Detailed flowchart of Budget Control Module**





**Table 3.2: Statement showing the non-utilisation of funds**

(₹ in crore)

Financial year	No. of Group of DDOs	Funds received	Expenditure	Savings	Percentage of savings
2016-17	759	4,342.68	2,116.46	2,226.22	51.26
2017-18	684	2,836.00	1,005.43	1,830.28	64.54
2018-19	90	3,682.09	1,596.78	2,085.31	56.63
2019-20	1,837	17,299.29	13,248.75	4,050.54	23.41

It can be seen from the Table that these heads of accounts assigned to group of DDOs had savings ranging from 23.41 *per cent* to 64.54 *per cent*. Grouping of DDOs affects the monitoring of expenditure by DDOs as no allotments are specified against individual DDOs and dilutes the budgetary control.

### 3.5.3 Fund release based on DDO request

Controlling Officers release funds based on the request received from DDO/group of DDOs. Release of fund based on request is dealt through a separate process ‘On Receipt of Additional Fund Request at CO’ in the System Application.

Analysis of budget control functionalities showed a defect in the implementation of the ‘Fund Request from DDO to CO’ process. The query that populates the screen is incorrect. The system takes into consideration the results for all the DDOs operating this particular HOA instead of the results pertaining to the logged in DDO. The CO who receives this data cannot respond to the request because of the incorrect figures.

To cite an example, for a request placed from the login of Range Forest Officer, Athani (DDO system code 4180 and user identification No. 1422288) under the Scheme – Afforestation on Forest and Non-Forest Areas (4406-01-101-0-03-139) for the year 2020-21, the system exhibited a set of figures (**Column 3 of Table 3.3**), which related to all the DDOs operating the HOA. However, when the corresponding data in the underlying tables was queried, the system exhibited a different set of figures for the logged in user (**Column 3 of Table 3.3**). Related screenshots are shown in **Appendix 3.3**.

**Table 3.3: Different set of figures exhibited for a particular HOA**

Details	Actual figures which should have been shown	Figures shown
Fund received by DDO	68,176	68,176
Actual expenditure	68,176	27,30,68,037
Expenditure in pipeline	0	39,30,251
Expenditure on pending bill	0	41,94,972
Total	68,176	28,11,93,260
Budget available with DDO	0	-27,29,99,861

Audit observed from the related UAT documentation that this feature was tested and passed.

The Government accepted the observation and stated (November 2021) that the system was not considering the DDO code of logged in user while generating the report during fund request by DDO to CO which led to incorrect calculation of pending, pipeline and actual expenditure for a budget line and the defect was rectified.

#### 3.5.4 *Certain budgets not made part of K2*

The following budgets of the State Government did not form part of the K2 application.

##### ➤ **Revenue Budget**

Audit observed that budget estimates for receipt head of accounts were not uploaded in K2 and there was no facility to monitor the progress of receipts.

The Government stated (November 2021) that the monitoring of progress of receipts against the budget estimates was carried out by the Controlling Officer and it was not in the scope of K2. This reply is not tenable as Revenue Budget was a part of FRS.

##### ➤ **Gender Budget**

The SRS for budget preparation module considered account classification and Management Information System (MIS) formats for Gender Budget (GB). These MIS reports were to enable the FD to generate and verify the GB volume at the time of finalisation of the budget. However, analysis of the tables related to Budget and Expenditure and discussions held with the Technical team of K2 showed that there was no provision to link a budget line with GB. The FD, in order to prepare the GB, runs its own software in Oracle, enters the budget data and identifies the budget lines as GB for monitoring.

Since GB was introduced in 2007 itself and K2 intended to capture the related data, the database could have been designed suitably to include provision for GB since the beginning of development of K2.

The Government stated (November 2021) that the Heads of Accounts across different departments operating GB would be distinctly identified in the scheme master to facilitate expenditure reports.

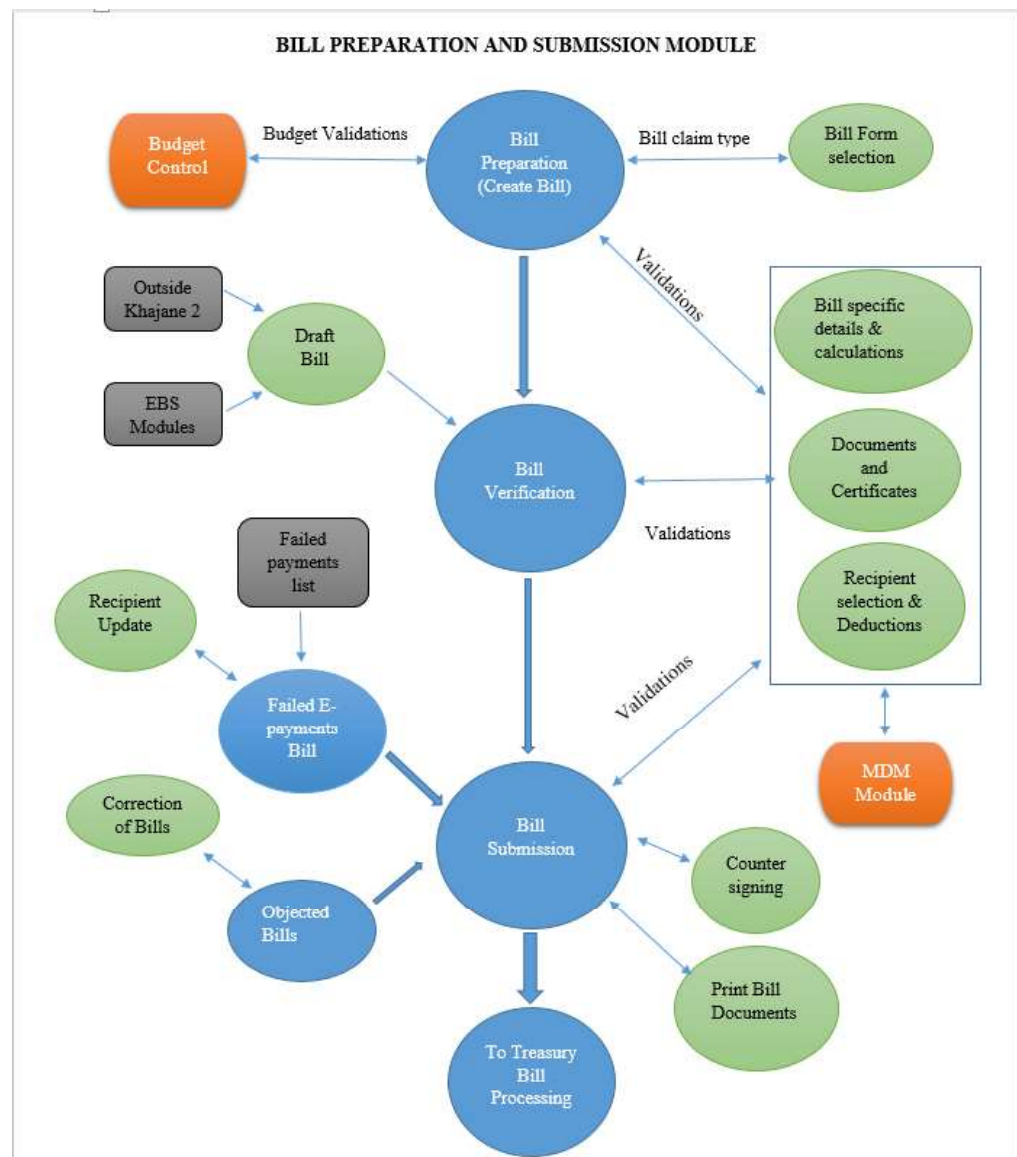
#### 3.5.5 *Action taken on audit findings in budget release discrepancies*

Audit observed various issues that were informed to DoT for its response. The DoT replied that it had initiated action to fix the problems pointed out which were verified. The details of issues noticed and corrective measures taken thereon are indicated in **Appendix 3.4**.

### 3.6 **Bill Preparation and Submission Module**

The Bill Preparation and Submission Module enables the DDOs to prepare their bills online for drawing funds. Bills can either be directly created in the module or could be imported from other modules such as NPS, Deposit, BMS *etc.*, or external systems for further processing. There are ten types of bills (**Appendix 3.5**) which are used to draw funds from the Government. The flow chart depicting the module is shown in **Chart 3.5**.

Chart 3.5: Bill Preparation and Submission Module flow chart



### 3.6.1 Deficiencies in the user interface for Bill Preparation

Bills could be created by directly keying in the bill data in K2 system through the user interface provided to case worker role in the Drawing and Disbursement Office. Audit observed the following deficiencies in the user interface provided to the case worker.

#### 3.6.1.1 No back button/edit facility

The claim type of the bill is to be chosen by the case worker in the first screen while creating a new bill. He proceeds to the next step by clicking on Forward Button. In case the caseworker has erred in choosing the right claim type and proceeds further, there is no back button or edit facility to correct the value. In such an event, one has option only to close the bill and restart creation of the bill. This results in delays in preparation of bills. A back button or edit option could have been provided in the bill creation module.

Similarly, there is no edit facility in case of deduction heads also.

The Government stated (November 2021) that back button and edit option features were under development.

### 3.6.1.2 Deduction heads not updated

The rates of deduction for the respective Heads of Account were to be mapped in the deduction module. Analysis of the master tables showed that the tax/deduction rates were not being updated as and when they were revised. For instance,

- (I) the rates of income tax for Tax Deduction at Source (TDS) were revised with effect from 14 May 2020 but the revision was not carried out in the Application. This resulted in the DDOs either deducting TDS at pre-revised rates or choosing the option 'Others' to type the correct deduction amount manually.
- (II) the DDOs were allotted a unique deposit account number for parking Goods and Service Tax (GST) deducted at source till it is deposited into Government account. For deducting TDS for GST, the bill creator has to choose the option Treasury Transfer Receipt (TTR) deduction in the deduction type and then select the deposit account number by typing in a few characters of the deposit number and choosing it from the list of deposit account numbers displayed. Since the deposit numbers linked to other DDOs are also listed, there is a possibility of choosing the wrong account number from the list. This could be avoided through display of the only those deposit number which are linked to the DDO instead of displaying all the deposit numbers, which could also act as a source of verification.

Analysis of the related data (GST deductions from bills and their transfer to the deposit accounts) showed 1,594 instances involving ₹15.84 crore wherein deductions were credited to deposit accounts not belonging to the DDO who prepared the bills due to incorrect input entries arising out of poor application input entry design.

#### *Illustration*

***An amount of ₹4.25 lakh deducted from bill Id 1413851369 (token number 1901203608) drawn by National Highways Divisional Office (NHDO), Chitradurga was credited to deposit account No.10556A074 belonging to District Co-Operative Societies Office, Bagalkote instead of crediting to designated GST deduction account of NHDO, Chitradurga.***

Further, when the default option of TTR is chosen, the rate of GST is taken as 10 per cent though the current rate of TDS is one per cent State GST and one per cent Central GST. Hence, the DDOs are required to choose 'Others' option and calculate TDS manually.

The Government stated (November 2021) that separate GST Deposit account is created for each DDO and mapped to the respective DDO. As a result, deposit account is operated for GST deductions by DDO. The fact remains that even in a test check, many instances of incorrect selection of Deposit Accounts leading to transfer of amount to incorrect DDOs have occurred.

*The Government may ensure that an appropriate ‘filter’ may be provided regarding GST TTR deduction in Bill Creation screen to avoid input errors in account selection.*

### 3.6.1.3 Difficulties in searching the recipient code

The case worker while preparing the bill was to provide the exact recipient code assigned to a recipient to whom the payment is being made. SRS provides two options to search the recipient; one is using Auto Complete functionality and another by using recipient bank account number. Auto Complete functionality will help the user to select the recipient by populating the list of recipients relevant to characters of the name entered by the user. However, search facility with name and recipient bank account number was not provided in the Application making the recipient searching process difficult.

Audit noticed that a Recipient Master Report was provided to Superintendent and DDO users and not to the caseworker who needs the recipient code to prepare a bill. Hence to get the recipient code, the case worker needs to

- (i) refer to the previous bills made to the recipient; or
- (ii) refer his own list containing recipient code and name maintained externally in Word/Excel file; or
- (iii) use the Superintendent login (Search and Modify Recipient Menu) and search for the recipient code by providing the recipient name.

The Government stated (November 2021) that caseworker has to perform some preparatory work before preparing a claim. Audit is of the view that as this feature was part of SRS, a drop-down list of recipients mapped to the DDO could have been provided with the recipient code displayed for reference. Additionally, search by recipient code /name could have also been provided to facilitate recipient search process.

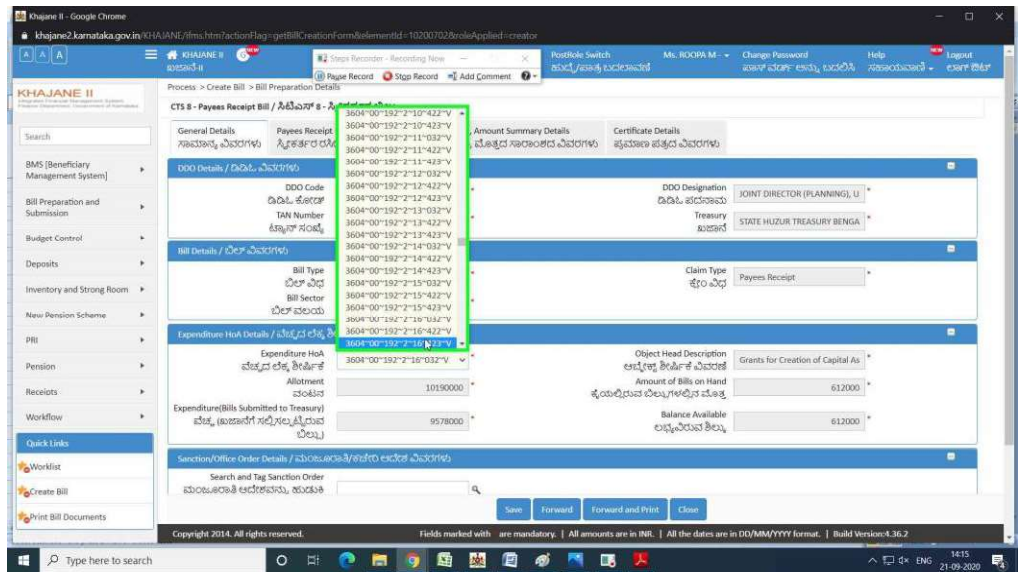
### 3.6.1.4 Unfriendly drop-down lists in the user interface

According to the MSA, the user interface of K2 should be easy to use and locatability<sup>14</sup> would be one important condition for judging the quality of an interface. Under the bill preparation form, the drop-down<sup>15</sup> list provides an expenditure head of account for the users to choose the budget line to which the expenditure relates. According to K2 standards and guidelines, it is required that a dropdown should display the nearest item in the list when the user enters a matching value in the detailed part. This function was not implemented. In many instances, the drop-down list had more than 20 options. Such drop-down lists create difficulty for users as it necessitates scrolling within the list to locate the desired item. When including a drop-down list, it is important to display the options in a logical order. This could include grouping related items together placing the most commonly selected item first or organizing the options in alphabetical order.

<sup>14</sup> Locatability is the property of a system which qualifies its capability in helping users identify and locate relevant information on a timely manner within the system

<sup>15</sup> Drop-downs are compact user input controls that allow users to select options. Drop-down lists organize content into a list allowing the user to select and provide input data.

An illustrative example of a drop-down list is shown below.



The Government stated (November 2021) that this was an isolated case related to Director of Municipal Administration who operates a long list of major heads. Audit observed that these were not an isolated case and there are 1,874 DDOs who operate more than 100 budget lines. The K2 should have enforced compliance with the standards for user interface.

### 3.6.2 Input Design for the preparation of salary bills of employees on deputation

The salary bills of regular employees of the State Government are processed in the Human Resource Management System (HRMS) Application and a draft pay bill is sent to K2 for payment processing. In cases of employees on deputation whose salary bills are not processed through HRMS, K2 provides an interface for the preparation of the Detailed Contingent (DC) bills. Similarly, K2 provides for use of ‘miscellaneous bill’ type for processing salary bills apart from other payments from the Personal Deposit<sup>16</sup> accounts. Audit observed that the design of the input screen was deficient as stated below:

- I. The same data needs to be entered afresh each time a salary bill is prepared. The historical data from the previous month’s salary bills are not fetched to avoid re-entry of the already available data.
- II. The interface allows preparation of the salary bills multiple times even for the same month, as there are no validations against the historical data.
- III. The interface does not provide for TDS deduction of Income Tax under Salary head. It provides TDS only for Section 194 G of the Income Tax Act.
- IV. The interface does not provide options for deductions such as Employee General Provident Fund, Employers Contribution of the New Pension Scheme, Life Insurance Corporation premium, Family Benefit Fund *etc.*

<sup>16</sup> The transactions of all local funds including municipal funds are recorded in the form of distinct personal deposits. These accounts are used for a variety of payment transactions including salary, non-salary, grant-in-aid, *etc.*

The gross deductions as a single amount was forwarded to parent department. The absence of break-up of deductions necessitates avoidable manual interactions with the department concerned. As a result, the actual remittance to the final agencies will not be available in K2.

The Government stated (November 2021) that DC bills were not designed for salary payments, and it was an interim arrangement until this can be facilitated in HRMS. Audit observed that at present, it provides for use of 'miscellaneous bill'/'DC Bill' option which does not take into consideration inbuilt checks used in salary bills of HRMS. Department may expedite processing of all types of salary bills in same application *i.e.*, HRMS.

### **3.6.3 Use of Payees' Receipts claim type for drawing grants.**

Payees' Receipt is a bill type that permits payment of amounts in the form of a simple receipt. The claims under this include direct payments related to lumpsum compensation (accident/unnatural death), monthly payment under Sandhya Suraksha Yojana, monthly payment of old age pension, widow pension payments, monthly payment of physically handicapped pension, lumpsum payment to the family of deceased Government servant *etc.*

The Financial Rules does not provide any follow-up instruments or returns like UC, Non-payable Detailed Contingent (NDC) bills, Advance Tagging, *etc.*, for monitoring the amount utilised and balance pending out of the amounts drawn under these payees' receipt bills. Amounts which require monitoring till its end utilisation and balance reporting should not be processed through payees' receipt bills. This requires that the claim types provided under this payees' receipt bill are identifiable to the type of the claim. Audit observed that claim type under the payees' receipts bill contained a general claim type (payees' receipt) for drawing amounts.

Analysis of 3,46,582 Payees' Receipts type bills for an amount of ₹2,47,735.53 crore from 2015-16 to 2020-21 (up to August 2020) showed that 68,885 bills (19 *per cent*) totalling ₹1,45,442.01 crore (59 *per cent*) were drawn on this general claim type. Further it was observed that the number of bills under this general claim type increased from 38 in 2015-16 to 23,242 in 2019-20 indicating absence of monitoring mechanism that allowed the departments to draw bills on this general claim type thus ultimately affecting the quality of final information provided by K2.

It was observed that even payment of grants to implementing agencies and autonomous bodies were drawn and paid through the payee receipt bills. Since these grants were not in the nature of final payments and the implementing agencies were required to furnish utilization certificates, making payments through payee receipts were not in order. It was noticed that during the period 2016-20, grants amounting to ₹11,914 crore was drawn on 862 payee receipt claim type.

### **3.6.4 General Provident Fund bills**

K2 provides for preparation and submission of bills under claim types - General Provident Fund (GPF) final withdrawal and GPF temporary advance. The application has the provision for fetching employee details from HRMS upon

entering the Karnataka Government Insurance Department (KGID) number of the employee.

### 3.6.4.1 GPF final bills submitted more than once

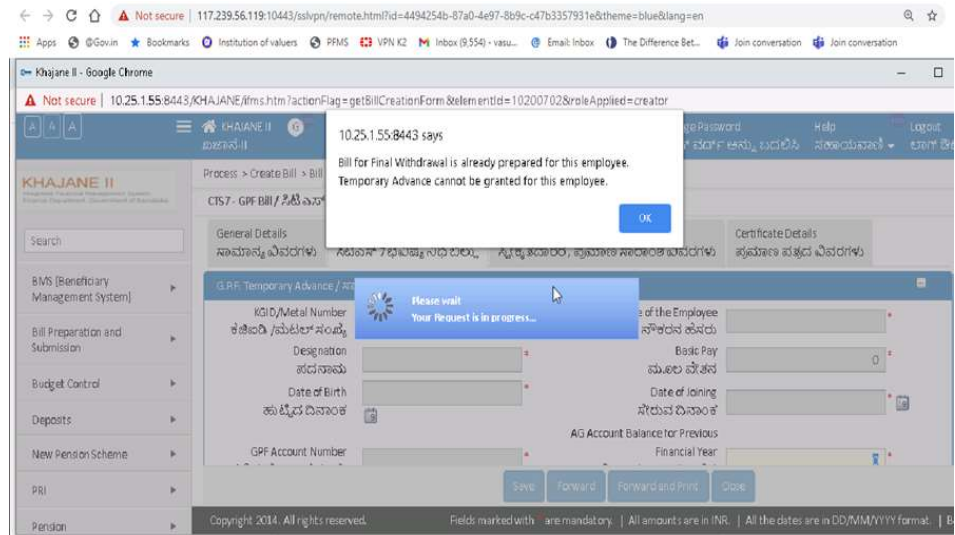
The final settlement of the GPF is paid as per the AG (A&E) authorisation. Audit analysis of the data showed that bills belonging to 434 individual KGID numbers were processed more than once. The total number of such bills were 873 for an amount of ₹45.80 crore. Out of these 873 bills, eight bills belonging to four individual KGID numbers were submitted twice with the same amount indicating the absence of checks and controls.

***A scrutiny of a sample of eight bills with records of AG (A&E), showed drawing of GPF final amount in excess of the available balance by presenting the final bill amount twice. An employee with GPF Number EDN 82611 was paid GPF final withdrawal amount of ₹10,07,314 twice (once in April 2019 and once in May 2019) resulting in an excess payment of ₹10,07,314.***

The Government stated (November 2021) that the GPF final bills settled in two instalments for withdrawal of subscription amount and residual balance. Audit is of the view that not distinguishing the subscription and residual bills in the K2 application is prone to risk of double payment as was seen in case study provided above. K2 needs to make provisions to capture and validate the nature of the GPF final withdrawal during bill creation.

### 3.6.4.2 GPF advance bills processed after final withdrawal bills

The application restricts the creation of a GPF temporary advance bill for an employee whose GPF final settlement bill has already been created. The screenshot with the error message is shown below:



Analysis of the data showed that 11 GPF advance bills for ₹14.69 lakh was paid after the GPF final bills were prepared and paid for these KGID numbers.

### 3.6.5 Inadequate validation controls in terminal leave encashment

Terminal benefits such as death cum retirement gratuity, commutation of pension, leave encashment on retirement are generally non-recurring one-time

payments. K2 provides for processing of bills under claim type 'Terminal Leave Encashment on Retirement or Death'. The amount payable is calculated automatically upon entering the earned leave that is being encashed. A maximum of 300 days of earned leave is allowed for a single employee for leave encashment. Analysis of the application controls over this claim type showed that a total of 1,329 bills for ₹37.59 crore belonging to 648 individual KGIDs were processed more than once. There was no provision to upload the sanction order/authorisation order because of which it was not possible to verify second claim. The authenticity of the bills submitted second time could also not be verified on the basis of the information available in K2.

The Government stated (November 2021) that terminal leave benefits were processed more than once for the same employee in cases of supplementary claims. The fact remains that K2 does not have the provision to distinguish the supplementary claims and controls specifying that the second claim as a supplementary claim during bill creation. This is prone to risk of double payments.

***The Government should ensure that validation controls for preparation of bills for terminal benefits be strengthened to avoid the risk of processing the bills multiple times.***

### ***3.6.6 Continued salary payments to employees even after their retirement***

Payment of retirement benefits to an employee is an indication that the employee has retired from the service of the Government. Once the employee is retired, the relevant tables in K2 needs to be updated to register the event of retirement. It was however, noticed that bill processing module and the master data on employees does not have sufficient validation features. A test check of the GPF final bill payments which were passed during the year 2019-20 with that of the salary payments after the GPF final payment dates and retirement data showed that 257 salary payments totalling ₹1,53,35,067 have been made to employees after their GPF final withdrawal bill in 2019-20. Thus, salary in respect of these employees has been drawn and paid even after retirement/death. Though the relevant data was available in the same tables to validate and reject the claims, the validation has not been implemented and these claims were passed. The list is for the test checked period only and requires comprehensive analysis of the entire data available in K2 in this regard to identify all the excess payments.

#### ***Illustration***

***An employee was retired on 30 November 2019 on voluntary basis. A GPF final withdrawal bill was passed on 2 March 2020 and payment made. It was observed that salaries for this employee was continued even during 2020-21.***

### ***3.6.7 Controls over preparation and submission of Abstract Contingent Bills***

Under Rule 36 of the Manual of Contingent Expenditure, 1958 (MCE), the DDOs are authorised to draw sums of money by preparing Abstract Contingent (AC) bills and are required to present NDC bills (vouchers in support of final expenditure) to the Accountant General (A&E) through the treasuries before the

15<sup>th</sup> of the month following the month to which the bill relates. COs should ensure that no amounts are drawn from the treasury unless required for immediate disbursement and it should also be ensured that the previous AC bills are settled before a new AC bill is drawn.

Audit observed that 58 AC Bills worth ₹9.16 crore pertaining to the period prior to 2019-20 were outstanding settlement for want of submission of NDC bills. K2 did not provide any reports to monitor the submission of NDC bills against the AC bills drawn

The Government stated (November 2021) that this was being strengthened through tight control of not allowing bill submission of any kind by the DDO until settlement of pending AC bill.

### 3.6.8 Deficient application controls over submission of NDC bills

K2 Application provides interfaces for preparation of AC bills and submission of NDC Bills designed on the basis of the SRS finalised as part of the Bill Preparation and Submission Module. NDC bill is prepared for each AC bill and provides the details of expenditure incurred out of the funds drawn on AC bill in the form of actual sub-vouchers. The unspent balance, if any, is remitted back to the Government Account. Analysis of the application controls in this regard revealed the following deficiencies:

- According to SRS, during preparation of NDC Bill, if there is any unspent amount in the AC Bill, the system would auto populate the challan reference number based on the token/voucher number of AC bills mentioned during the creation of challan. However, this functionality for linking the challan with AC bills was not provided.
- Similarly, as per SRS a challan generation functionality would be invoked for remitting the unspent balance. Audit observed that this provision for invoking the challan generation functionality during the bill preparation was not provided
- As per SRS, application should also provide an option for the user to enter the challan reference number for unspent balance. Audit observed that the application permits entry of any challan reference number and even challan reference numbers dating prior to the withdrawal of AC bills Thus, input controls over the entry of challan reference number were inadequate.
- The due dates for submission of NDC bills from the date of drawal of AC bills was different in respect of some departments such as Animal Husbandry (2 months), Director of Collegiate Education (12 months for scholarships) etc. This required configuration of the time limits within which the NDC bills were to be submitted by the DDOs. Though the SRS provided for department and DDO-wise configuration of time limit, this functionality was not included in the application.

The Government stated (November 2021) that a check had been built to ensure that a challan paid earlier to the date of approval of AC bill or refunded challan cannot be tagged to the NDC bill. Time limit of 30 days was configured for settlement of AC bills and the MIS reports were under development.

### 3.6.9 Inadequate classification of claim types under DC Bill

The claim type master table contains an omnibus claim type DC Bill under DC bill type (CTS-5). While creating the bills using this omnibus claim type, the screen lists all the 15-digit budget lines for selection, providing scope for incorrect selections by the users and misclassification of the bills. During the period 2015-16 to 2019-20, the DDOs processed 3,71,273 DC bills for ₹30,678.01 crore by choosing the DC bill claim type (**Appendix 3.6**). The claim type has to provide additional information on the nature of the expenditure. Providing an omnibus claim type without specifying the nature of the expenditure thus resulted in huge amounts being drawn under this claim type.

### 3.6.10 Sanction orders not available in K2

The sanction order is a pre-requisite for creation of bill. The module provides for auto population of sanction orders in the bill creation screen wherever sanction orders are generated and issued through K2. In case online orders are not available, the order number needs to be entered and physical copy of the bill attached as a supporting document. K2 system does not have an option for scanning and uploading the sanction order.

Audit observed that the processes for sanction order creation and mapping of general Delegation of Financial Powers were yet to be completed and put in production. During the period 2015-16 to 2020-21, a total of 45,35,988 bills valuing ₹4,25,552.94 crore, were created and processed. These bills in the K2 database were not supported by electronically generated sanction orders. It only provided a reference data to the manual sanction order. Analysis of the bill data showed that the sanction order reference data entered contained junk data such as 1, 2, 3 in place of the sanction order details as indicated in **Appendix 3.7**. Absence of electronic sanction orders coupled with unreliable reference data impacted the completeness of the voucher information captured by the K2.

The department stated (August 2020) that online sanction order has now been moved into production and operationalized. DDOs will be trained about creating sanction orders online and tagging them to bills. Trainings are being planned and both the modules will be employed to tag sanction orders online. Audit is of the view that sanction was an important information based on which a financial transaction is initiated. In the absence of sanction order authority of past years, voucher information captured by the K2 was incomplete and required continued reliance on the physical data.

### 3.6.11 Drawing and Disbursing Officers functioning as Countersigning Officers

As per the codal provisions, the Countersigning officer (CSO)/CO shall be an officer superior to the person drawing the bills. Audit observed that 2,277 DDOs have discharged the functions of the CSO and passed bills in 2,50,983 cases till the end of August 2020.

In such cases, the existing process requires the DDO himself, after approving the bill and forwarding it to CSO, to switch over to the CSO role for visiting the bills awaiting countersignature, approve the bill and switch roles once again and receive the countersigned bill and forward it. This arrangement not only

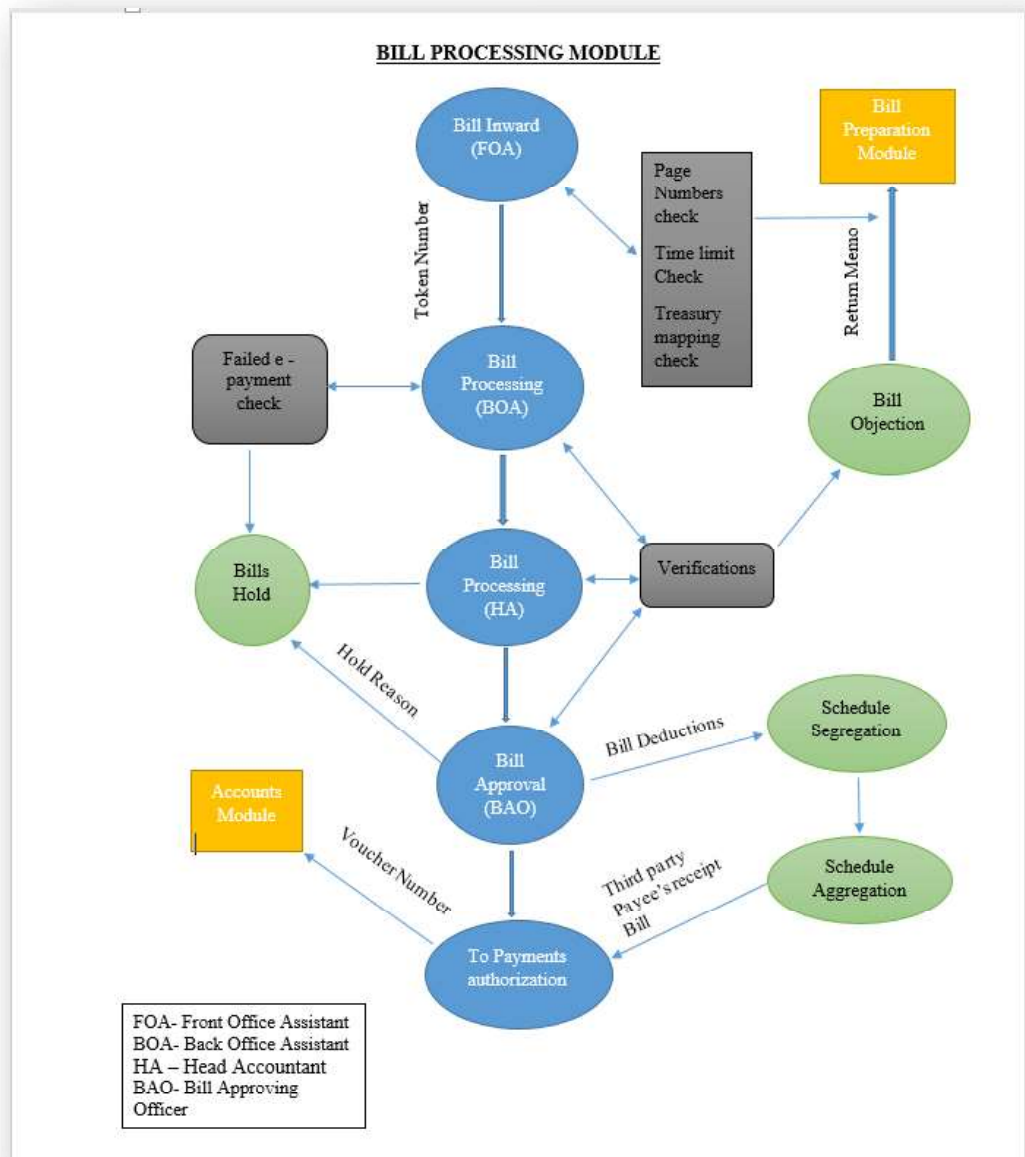
violated the necessary checks that should have been in place but also resulted in a false assurance that the bill has undergone an additional scrutiny by a superior officer countersigning it. This also highlights the fact BPR exercise was insufficient wherein it failed to strengthen the segregation of duties in a computerised environment.

The Government stated (November 2021) that a DDO who is also a CSO will perform distinct responsibilities as a DDO and as a countersigning officer. The verifications are different. Audit is of the view that assigning two conflicting tasks to the same person was not in line with the principle of segregation of duties.

### 3.7 Bill Processing Module

This module provides functionalities for verifying and processing the bills submitted by the DDOs to the Treasury. Bills can be submitted to the Treasury either on-line or manually. Bills prepared by the DDO in Bill Preparation and Submission module of K2 system are considered as online bills. These bills will be first accepted in the system by the Front Office Assistant (FOA), verified by the Back Office Assistant (BOA) and forwarded to the Head Accountant (HA) for further scrutiny. The final approval authority for all bills is the Bill Approving Officer (BAO). DDOs who do not have access to K2 submit the handwritten or printed bills that have not been prepared in Bill Preparation and Submission module. This feature would be available till K2 becomes completely operational and accessible to all DDOs. The data entry of these bills will be done in Treasury by the FOA and BOA and the HA will scrutinise the bills. The flow chart depicting the module is shown in **Chart 3.6**.

Chart 3.6: Bill Processing Module flow chart



### 3.7.1 Bills on hold

As per the FRS, most of the bill validations would be system based and carried out during bill generation. This would reduce the subjective and arbitrary objections raised at the Treasury level besides leading to transparency and standardisation across the State. The SRS also envisaged automated withholding of bills.

Audit observed that the system of manual intervention continued. The Treasuries kept the bills on hold for missing supporting documents, lack of fund, missing authorisation, recipient details/bank details mismatch and other reasons. The reasons are entered in bill movement transaction table in the K2 Application and the common lookup master table in the Application contains

the reasons for bills on hold. The year-wise number of bills kept on hold for various reasons are mentioned in **Table 3.4**.

**Table 3.4: Year-wise details of bills kept on hold**

Reason code	Reason	2014	2015	2016	2017	2018	2019	Grand Total
10302703	Missing supporting documents	1	1	194	2,449	7,316	12,163	24,321
10302705	Lack of funds	0	0	84	53	109	233	506
10302707	Missing authorisation	0	0	87	1,004	4,045	7,814	14,160
10302709	Other	0	0	173	1,793	7,232	14,140	25,388
10302711	Recipient details/ bank details mismatch	0	5	1,209	349	693	632	2,944
<Null>		0	1	188	48	0	0	238
Grand Total		1	17	1,935	5,696	19,395	34,982	67,557

The above table shows that 37 *per cent* of the bills were kept on hold citing ‘other reasons’ and in respect of 238 bills, no reasons were recorded. Not recording any reason would result in an exception and shows an error by the application. The absence of clarity on the reasons for keeping the bills on hold also makes it difficult for the DDOs to set right the omissions. Further, there was no time limit prescribed for rectifying the omissions for bills on hold. The amount in the bills is shown as ‘expenditure in the pipeline’ and is not available for other purposes. During 2019-20, 34 bills worth ₹83 lakh were kept on hold for one to 125 days after which they were cancelled at the end of the financial year resulting in lapse of funds.

The Government stated (November 2021) that the other reasons for which bills were being held would be standardised and added to the list of reasons.

### 3.7.2 Missing Auto Generated Items

The system generates the bill identification (primary key of bill head transaction table of the application) and token numbers in a sequential order. When bills are rejected/cancelled during bill processing, the status is captured without deleting the record. Audit observed gaps in the sequentially generated

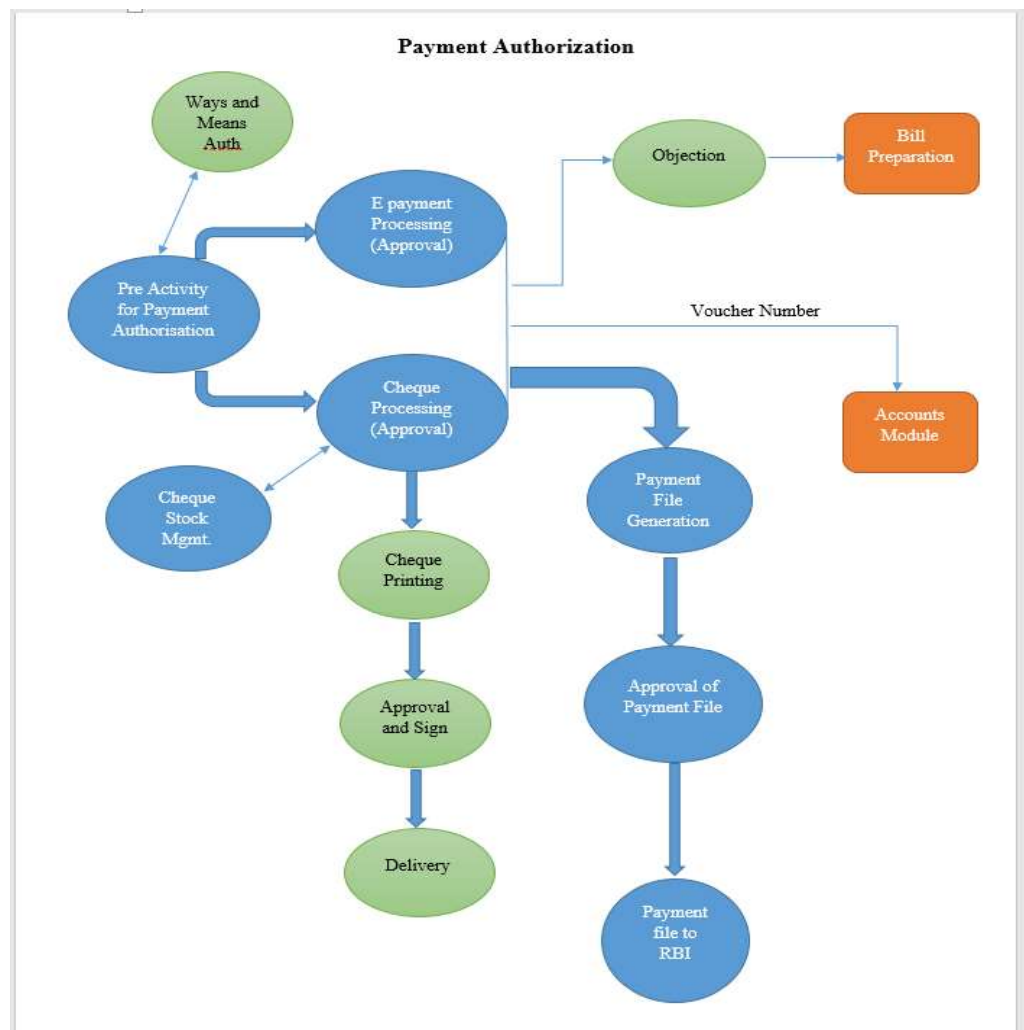
- Bill ids – the continuous gap between bill ids ranged between 34 and 393.
- Token numbers – 16 tokens between the numbers 2003411591 and 2003413171 were not found in the system.
- Similarly, there were missing items in the bill requisition id in the Receipt Refund Bill Transaction.

The Government stated (November 2021) that sometimes user opens the bill creation form but does not submit the same, sequence gets incremented since form is not submitted, id does not get captured in the corresponding table. The fact remains that the gaps in the token numbers which is generated after the approval of a bill by DDO were not explained. Also, the gaps in important serial numbers such as Token numbers and Bill ids affects the quality and reliability of the data.

### 3.8 Payment Authorisation Module

The bills approved in the Bills Processing Module are forwarded to Payment Authorisation Module for payment instrument generation. This provides the functionalities for printing of cheque or generation of electronic clearing system payment mandate. Head Accountant generates the draft payment advice, Treasury Officer verifies, approves and sends payment advice to bank. The payment instruments include cheques, National Electronic Fund Transfer (NEFT), Real Time Gross Settlement (RTGS), and TTR. The flow chart depicting the module is shown in **Chart 3.7**.

**Chart 3.7: Payment Authorisation Module flow chart**



**3.8.1 Same token number associated with multiple bills – Double payments**

A token number is a unique number generated by the system when a bill is passed by a DDO. There cannot be two tokens generated with the same number. Analysis of bill transactions in the database showed that three bills (1413028655, 1413028650, 1413028634) were associated with the same token No. 1800395519. All these bills were generated towards SGST refund for exports made by the refund recipient M/s. Cotton World for the same amount of ₹1,19,431. The status of the bills is indicated in **Table 3.5**.

**Table 3.5: Status of bills associated with the same token number**

Bill number	Status	Payment id	Voucher number
1413028655	Rejected by DDO		
1413028650	Paid	E572E180119000376	0006572E0219000215
1413028634	Paid	E572E011218001224	0006572E1218000038

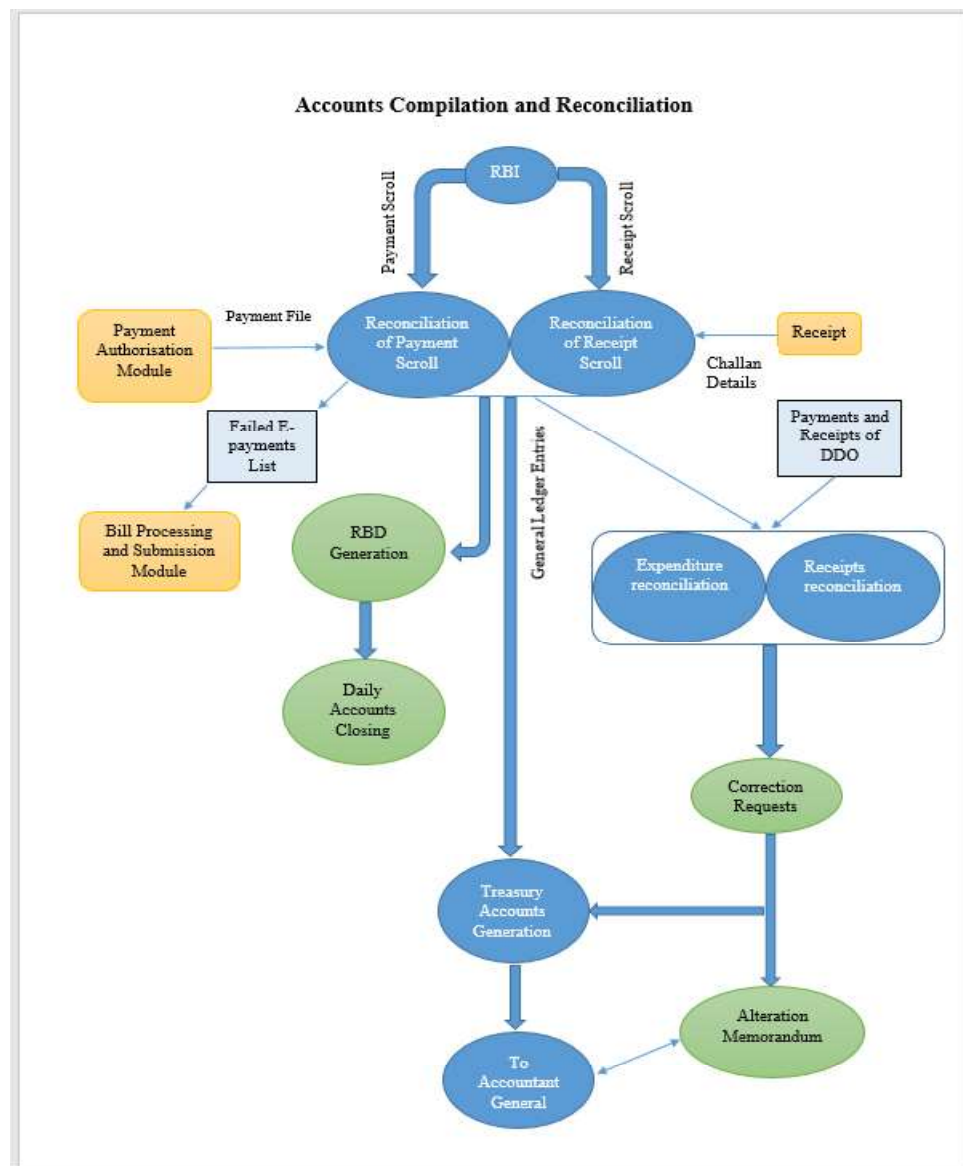
Further analysis of refunds made to M/s. Cotton World showed only one refund order generated (refund order Id number 1410691869) in Receipt Refund Transaction Table. No bill requisition Id was captured for this record. However, the token number updated against this id in Receipt Refund Transaction table was the same token number linked to the three bills discussed above. Thus, two payments were made for the same refund order.

The Government stated (September 2021) that there was inconsistency observed in updating records in case of revenue refund bill in both bill and receipt tables. Same has been corrected now through patches.

**3.9 Accounts Compilation**

Accounting refers to the function that records and integrates the results of financial transactions that occur in K2. Accounting in K2 aims at comprehensively capturing all accounting information including departmental personal ledger accounts. K2 aimed at generation of daily accounts of the State prepared with a high degree of accuracy and generation of accurate monthly accounts within two to three days of month end; generation of daily cash position of the State including payments and receipts that are in the pipeline. The flow chart depicting the module is shown in **Chart 3.8**.

Chart 3.8: Accounts Compilation Module Flow Chart



### 3.9.1 Expenditure not booked

K2 provides for accounting of each bill after it is approved in Treasury. When a bill sent by DDO to Treasury is approved for payment, a voucher is generated and expenditure booked against that bill. The application then passes general ledger entries by debiting the corresponding Head of Account of that bill. The Accounts General Ledger Master table records the general ledger entry corresponding to voucher generation and the voucher amount is reported as expenditure in the KFC 62B report of the corresponding DDO. Once the expenditure is booked, the DDO cannot use the funds towards any other bill.

Audit observed that general ledger entries were not available in the above table for 16 approved and paid bills worth ₹48.92 lakh pertaining to 16 DDOs (**Appendix 3.8**) during the period 2016-17 to 2018-19. Consequently, no Head of Account was debited, and no expenditure was booked against these bills

resulting in non-reflection of these expenditure in the KFC 62B report of the respective DDOs.

The department stated that missing entries of these bills has been reported to technical team as a defect which has been fixed through patch deployment. The reply did not mention about the action taken for correction of accounts with respect to these transactions.

### ***3.9.2 Memorandum of Error not generated for duplicate payment scrolls***

Each payment in K2 is identified using a unique payment identification number. The system sends the payment file to banks which contains payment information against each payment Id. For each and every payment file going from K2 there is a scroll coming back daily from RBI addressed to the respective payment instruction issuing treasury. The system will reconcile the scroll by matching the payment Ids in scroll with the payment Ids in the payment file sent to RBI and carries out Debit entries in the suspense accounts which completes the accounting process. If a payment id is found more than once in one or more scrolls, the system will generate Memorandum of Error (MOE) for the duplicate payment id.

Audit observed that the application processed 1,166 payment ids worth ₹2.32 crore more than once instead of generating MOE for the second instance. This resulted in duplicate debit entries from suspense heads for these payment ids.

The Government stated (November 2021) that the issue related to RBI 1.0 version. The shortcomings of RBI 1.0 have been overcome and RBI 2.0 version reporting is in place. In RBI 2.0, issues of such duplicate scrolls being sent by RBI has been resolved. The reply did not consider the shortcomings of K2 in accepting the duplicate scrolls related to same payment id. The reply also did not mention about the rectifications carried out in the suspense accounts.

### ***3.9.3 General ledger entries not updated***

The Payment Authorisation Detail transaction table of the Application stores the status of each payment and gets updated throughout this process. The final intended status of any payment for which the scroll received is 'Payment Successful'.

Audit observed that the status of payment in the above table of the Application for 35,836 payment ids valuing ₹137 crore which were generated before 31 March 2020 was shown as 'Scroll Processed' and no general ledger entries were found in Accounts Ledger Master Table of the System though the payments were successful and scrolls received. This resulted in the Suspense Heads of account exhibiting the amounts as not cleared but pending final clearance. Continued exhibition of amounts in the suspense account carries the risk of processing the amount again for clearance which would result in multiple payment processing.

The department stated unaccounted scrolls were identified and revised reports would be prepared and submitted to Accountant General. It also agreed to incorporate changes in the preparation of reports related to accounts.

***The Government should ensure that K2 should provide a functionality for enforcing periodical review of the status of scrolls and clearance of suspense accounts.***

### ***3.9.4 Inconsistency in accounts and non-reconciliation***

Analysis of data of bills, vouchers and payments showed inconsistencies in respect of voucher No. 2014566A0119001635 of Chitradurga Treasury for ₹9,794. The voucher was shown as passed on 18 January 2019 in the Payment Detail Transaction table and on 18 March 2019 in the Bill Header Transaction table. The Bill Header Transaction table further showed the bill status as 'payment delivered' on 18 January 2019. According to the voucher numbering pattern wherein the month of the voucher is coded into the 9th and 10th characters, this voucher was created during January 2019.

Audit observed that this voucher appeared in the monthly accounts of March 2019 as submitted by the Treasury to Accountant General (A&E) indicating the non-reconciliation of figures by the Treasury before submission.

The Government stated (November 2021) that this bill was approved by Treasury Officer (TO) and voucher was generated in January 2019. But in March 2019, recipient had complained saying that payment was not done against this token. On verification, it was found that due to technical issues in the application, this bill when approved by TO only voucher number was generated but there were no entries in accounting tables and token was not communicated to RBI for payment. Hence to allow communication of payment of this token, accounting entry was made from backend and then to reflect the bill in accounts, voucher date was updated from January to March.

Audit is of the view that such alterations from the back end and intervening in the payment process impacts the integrity of the payment process.

### ***3.9.5 Reconciliation with RBI***

The payment and receipt activities primarily result in a net increase or net decrease of cash balance of the Government with RBI. Hence, it is necessary for IFMS management to design and document the processes and their rationale/thought process behind the design for assurance regarding the correlation of RBI figures with that of figures and accounts prepared from the data maintained in the system.

Audit sought for the details such as;

- the process implemented in K2 to tally the daily balances in RBI against the total receipt and payment transactions of K2;
- the process which enables K2 management to assure itself that the total payments, total receipts and balances in RBI are in accordance with the information available within K2;
- the periodicity of these processes, number of occasions where the balances did not tally during the period 2015-16 to 2019-20 and aging report of transactions/amounts which have not tallied; and

- the availability of MIS report showing the total receipts, total payments as per K2 and as per the balances reported by RBI and breakup of variations treasury wise.

The department had not furnished the above information indicating the absence of such a mechanism within the application.

At present the RBI sends the monthly cash balance statement to the AG(A&E) who then does the accounts reconciliation on the basis of the accounts rendered by the individual treasuries, thereafter the monthly civil accounts are prepared by the Accountant General. The cash balance reconciliation done by the Accountant General is delayed as it is linked with monthly accounts manually received from the treasuries and the monthly accounts are finalised only in the subsequent month. In case of delay in receipt of the accounts from the treasuries, the monthly account preparation and dependent reconciliation could be further delayed.

AG (A&E) had brought out these aspects of delay in reconciliation and urged the State Government to put in place a mechanism to obtain periodical cash balance position from RBI and its reconciliation and to prepare a certificate of reconciliation and mark a copy to the Accountant General. However, a mechanism for reconciliation of the cash balance comprising of the receipts and payments was yet to be put in place.

***The Government should ensure that the reconciliation mechanism be put in place to achieve periodic and real-time reconciliation between various stakeholders.***

### ***3.9.6 Delay in remittances to K2***

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KFC provisions stipulates that all transactions to which any Government servant in his official capacity is a party must, without any reservation, be brought to account, and all moneys received should be paid in full without undue delay in any case within two days, into a Government treasury, to be credited to the appropriate account and made part of the general treasury balance.

Further, according to Article 329 (v) of the Karnataka Financial Code, no challan should be acted upon by any Government officer unless credit for the money is first traced to the treasury accounts. The Department could deliver service to the citizens only after the confirmation of the receipt through the treasury reports. Thus, it is important that the time window of remittance to the bank and the actual accounting in K2 is reduced to enable timely delivery of services to the citizens.

Audit analysed a total of 63,46,208 entries for the period January 2016 to August 2020 under payment status 'Payment received at agency bank' (cash remittances made through challans) to observe the time taken for processing the challans. The agency bank which accepts the challan shall generate scrolls and send to RBI within one day of the transaction date after necessary reconciliation. It was observed that there exists a time lag between bank reconciliation and generation of scrolls to be sent to RBI. Similarly, after the scrolls are reconciled at RBI and sent to K2, the system is supposed to consume the scrolls and update its own tables, thus taking the transaction amount into account. Audit observed delays in accounting the transactions.

The time lag in transactions and accounting is shown in **Table 3.6**.

**Table 3.6: Statement showing the delays in remittance and accounting**

(₹ in crore)

Time lag between bank reconciliation date and RBI scroll received date	Remittances to Government Account		Accounting under K2	
	No. of entries	Amount	No. of entries	Amount
≤ 1	20,05,648	3,401.83	10,25,683	1,682.67
> 1 ≤ 5	39,07,496	6,048.94	13,57,725	2,247.40
> 5 ≤ 10	2,52,311	421.98	13,07,077	2,174.21
> 10 ≤ 20	1,14,769	288.84	17,85,049	2,791.45
> 20 ≤ 30	44,645	80.32	7,29,928	1,117.34
> 30 ≤ 60	20,645	37.49	1,40,746	266.82
> 60 ≤ 120	257	0.18	0	0
> 120 ≤ 180	427	0.28	0	0
> 180 ≤ 365	5	0.01	0	0
> 365	5	0.02	0	0
Total	<b>63,46,208</b>	<b>10,279.90</b>	<b>63,46,208</b>	<b>10,279.90</b>

The delay in accounting the challans results in delay in providing services to the citizens as according to the codal provisions services to the citizens could be provided only after the accounting of the amount remitted in the Government account.

The department explained the delay on the part of the bank in remitting the challan amounts to RBI. The reply was, however, silent on the delays by K2 in accounting the receipts.

### 3.9.7 Actual date of remittance of challan not captured

As per Government instructions, the time limit for credit of Government receipts by Agency Banks, Public Sector Banks and Private Sector Banks to Government account in RBI was revised (September 2019) from T+3<sup>17</sup> days to T+1 day where T stands for the day the amount is received by the dealing branch. Any delay in remittance attracted penal interest.

Under the manual procedure, when cash is deposited in the agency bank, the challan was manually stamped with date, and it was possible for identifying the actual date of remittance of cash by the remitter to the bank. Audit observed that a method to inform the State Government of the actual date of physical collection of remittance by the bank was not devised.

K2 computes the penalty based on the actual date of physical collection as reported by the bank. Though ₹3.63 crore was computed as penal interest as of 31 March 2020, the agency banks had paid only ₹0.77 crore. The penalty and interest payable as of 31 December 2020 stood at ₹3.17 crore including arrears.

<sup>17</sup> T+3 days where the collecting bank branch and focal point branch of the bank are in the same city/agglomeration, T+5 days where collecting bank branch and focal point branch are in different city/agglomeration and T+12 days where branches were situated in remote, difficult and hilly areas. T+3 days applied to Private Sector banks irrespective of the area of operation.

### **3.9.8 Incomplete processes in Accounts Module**

As of March 2020, sub-processes like preparation of correction requests, Alteration Memorandum (AM), Modification of Accounts Based on AM, receipt reconciliation with DDO, reconciliation of expenditure with DDO, CO, CCO, modification of accounts based on DDO/CO request, processing of lapsed cheques, DMS and VDMS processing *etc.*, were yet to be developed and deployed in production. Thus, the module was incomplete and yet to reach the envisaged maturity level.

### **3.10 Master Data Management**

K2 adopted the Master Data Management (MDM) methodology to ensure the uniformity, accuracy, consistency and accountability of the master data assets.

#### **3.10.1 Absence of mapping between claim types and object heads**

The SRS provided mapping of claim types to object heads to ensure correct classification of expenditure. The DDO creates a bill out of the 167 claim types provided in the Application system. Audit observed that the claim types are not mapped to object heads but was done for the entire 15 digit HOA. This resulted in DDOs approaching the helpdesk for mapping budget lines to claim types. As per the help desk data there were 108 requests during the 2019-20 alone. The consequent effect was the delay in preparation and submission of bills till the helpdesk resolves the issue.

#### **3.10.2 Inadequate claim type classification**

The data elements in the claim type table provides for 167 claim types for classifying the expenditure. It was observed that these claim types were not dealt in at a granular level. For instance, claim types related to expenditure on procurement under medical equipment, expenditure on computers, software were not available whereas categories for capturing the information on “procurement of carpets”, “stitching charges” were available. These claim type classifications need to be made contemporary in line with the evolving information requirements of Government.

#### **3.10.3 Purpose level information not captured**

The Accountant General captures information only at the macro level from Major Head to object head. It does not capture information below object head of expenditure. Manual of Contingent Expenditure specifies the need for classification of expenditure beyond object head levels for the purpose of better financial control at the department level. Depending on their information needs, individual line departments would require information in greater detail for internal control and day-to-day decision making. As some of these information/reports could be specific to the line department concerned and not part of the generalised Chart of Accounts of the whole Government, a purpose level chart of accounts is a critical element of the PFM framework for classifying, recording and reporting information on financial transactions and events in a systematic and consistent way. Though SRS envisaged and built a purpose level master table for populating purpose level information while

creating bills it was observed that this is not being utilized in K2 application. Thus, non-preparation of purpose level chart of accounts in consultation with the departments resulted in lack of visibility into the granular level classification of expenditure. The opportunities presented by the computerised system were not fully utilized.

### ***3.10.4 Incorrect mapping of Treasury Transfer Receipts***

Analysis of the master data corresponding to mapping of TTRs with HoAs showed the incorrect mapping as below.

- Three TTR codes (1236, 3149, 3272) relating to Right to Information Act penalty was mapped to Motor Car Advance principle under the HoA 7610-00-202-0-01-000;
- Three TTR codes (3372, 2273, 3374) relating to HoA 8009-01-101-0-01-000-Other Receipts of Horticulture department was mapped to General Provident Fund of Karnataka;
- Recovery of losses caused by employee was mapped to Karnataka Government Family Benefit fund under three TTR codes (1240, 3102, 3224);
- Advance for medical treatment mapped to Advance for purchase of personal computers; and
- Penalty for delayed works mapped to receipts from water tanks.

The incorrect mapping resulted in misclassification of receipts. The department did not explain to audit the rationale behind the incorrect mapping of TTRs.

The Government stated (November 2021) that the deduction/recoveries heads of account has been cleansed and mapped to correct heads of account in K2. The incorrect mapping points to the deficient application process controls in the initial mappings and Audit is of the view that a third party audit along the lines envisaged in MSA would be needed to identify such functional discrepancies.

### ***3.10.5 Mapping of activities to roles, users, offices and departments***

Audit analysis of menus and features such as screens, forms and reports provided to users showed that the user screen is populated with certain links and menus that are either not relevant to the user or reject the users request as unauthorised access. Thus, the functionality that is not intended for the user is being presented to the user in his login. There is a disconnect between the presentation layer (user interface consisting of links and buttons and menus and various input controls provided to the user generated by the role set up and configuration) and the business layer (which among other things implements role-based access and business rules at the server side) indicating issues relating to mapping of activities to roles, users, offices and departments as illustrated.

**Illustration**

*Analysis of login of Karnataka State Information Commission showed the following deficiencies:*

- *Funds distributed at CO report (BDC 015) lists several redistribution order numbers for viewing which belong to Crop Husbandry, Forestry and Wildlife, Water Supply and Sanitation etc., and not to the State Information Commission.*
- *CO Fund Release report (BDC 004) shows choice of five Administrative Departments for this user (Finance, Personnel and Administrative Reforms, Labour, Public Works, Ports and Inland Water Transport and Department of Personnel and Administrative Reforms (Janaspandana).*
- *DDO fund release and expenditure report (BDC 005) shows the same choice of five Administrative Departments as above in a chronological order.*
- *Order details for fund release (BDC 002) by CO to DDO shows more than 20 departments as choices of Administrative Department.*
- *The module level choices include Panchayat Raj Institutions (PRI) menu with sub menu and the fund request is related to PRI. PRI budget activities are not related to the State Information Commission.*

This requires a periodical review of the mapping of activities to roles, users, offices, and departments to remove inconsistent application behaviour.

The Government stated (November 2021) that the issue of other department orders populating in fund releases of a department was fixed. The incorrect mapping points to the deficient User Acceptance Testing of the mappings and Audit is of the view that a third party audit along the lines envisaged in MSA would be needed to identify such UAT issues.

### **3.10.6 Element Role Mapping**

Elements are the links/forms/screens in K2 used for performing the various activities. Each role in K2 has a set of pre-defined activities that can be performed by the user mapped to that role. According to SRS functionality, the role-element mapping facility (adding/modifying elements mapped to different roles) would be provided in the application for use by K2 Master Maker role.

Audit observed that no functionality was created for K2 Master Maker for mapping the roles to elements in the Application. It cannot independently map an element to roles in accordance with the requirements rendering it less versatile. Consequently, it cannot assign a particular report viewing facility to FD/AD/or any other user if a need arises. This need can only be met by the SI.

The Government stated (November 2021) that simply mapping a role to an element would only provide the access of that link to the user rest other configurations will not be available to that user and hence user may not be able to achieve the complete functioning of element. Audit is of the view that since the SRS envisaged providing role element mapping facility for use by the K2 Master Maker role the necessary functionalities should have been configured to enable the complete functioning of the element mapping. This also would

reduce dependency of the K2 application on the SI. For example, the SI raised a change request (CCN Number: K2/BPS/00023 for an estimated amount of ₹31,000 ) to map an existing element 'Bill status report' to caseworker role.

### 3.10.7 Issues in Recipient data

New recipients are created by DDOs and mapped to the DDO. If the recipient provided services to another DDO's office, his records were to be mapped to that DDO as well. The recipient name should be the same as his bank account name. A recipient can have only one bank account number registered with the DDO. Change in bank account, Indian Financial System Code (IFSC) and Magnetic Ink Character Recognition (MICR) Code combination of a recipient will trigger the de-activation of the earlier account with all DDOs with whom the recipient is mapped. The recipient will, therefore, have to furnish the bank details through a fresh e-mandate to all DDOs with his existing recipient Id. Audit observed that same recipient was found with different active recipient codes, bank accounts and names.

Further, any DDO who proposes to make payments to the recipient can fetch the recipient details from the central database when a payment is processed. The DDOs can also modify and update the existing recipient details after accessing it from the central database through a search option. Thus, multiple DDOs can fetch the recipient details for payment processing and have access to modify and update the recipient details freely in such a multi-transaction environment. When payment processing and recipient data updating can be done on the same set of data, it is important to provide sufficient controls to avoid conflicts especially because both the transactions are separate, both accesses the same data item and one of them is 'write' operation.

Audit observed that while payment processing by one DDO is in the pipeline, another DDO can make changes to the bank details of the recipient which can materially influence the outcome process by the first DDO and the system does not prompt him to obtain a fresh mandate as envisaged initially. Since the recipient data contains details of destination and bank accounts, modification in such sensitive information being unnoticed by the payment processing DDO could have the effect of payments being channelised to unintended bank accounts or result in failed e-payments of bills submitted with old bank IDs of the recipient.

Audit analysis of a recipient, Karnataka State Electronics Development Corporation Limited (KEONICS) showed that;

- The agency had 392 recipient ids of which 52 were active.
- There were 35 active recipient codes and 40 different bank accounts associated with these 52 recipient Ids.
- Some of the bank accounts had incorrect bank account numbers like 0, 111111., dummy account 0001 or the bank account numbers with 000s added.
- The name for payment (bank account name) was registered as Keonics, Keonics Bangalore, Keonics Bengaluru, Karnataka State Electronics Development Corporation Limited, etc.

- Another recipient was created with recipient code No. 2903418332 and two recipient identification Nos. 1415477511 (bank account No. 2000083867 created on 28.02.2020) and 1415632657 (bank account No. 52010100005955 created on 18.3.2020). Both the records were created and updated by the same official in a DDO office.
- There are at least 272 payments that have failed and re-submitted during the financial years 2019 and 2020. Out of these 13 payments passed on 01 March 2020 and 8 March 2020 have failed as the 'Account was not found'. These bills were subsequently re-submitted for payment after the account number was corrected on 18 March 2020.

Audit also noticed that there are atleast 200 active recipient accounts with 'dummy' in the bank account name and at least 100 active recipients with just 0s in the bank account number. This indicates that the changes in recipient bank details were not necessarily initiated by the recipient but by the DDOs themselves. The bank mandates were also not signed by the DDOs and the recipient in all cases. Further, 22,25,857 out of 43,69,237 recipient records were created and updated by the same person through IFMS Recipient Master table. There were no MIS reports to provide details of the creator and approver of recipient records. MIS report to search a recipient by, the list of payments made and their status was also not available.

The Government stated (November 2021) that the DDOs were found to create multiple IDs under different recipient types. It was further stated that a change was effected to ensure modifications in recipient details would not affect the bills under processing. The reply of the Government did not consider the risk in K2 permitting the DDO to modify the recipient information without informing the recipients.

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### 3.10.8 *Incomplete Data Dictionary*

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The first step in analysing a system of objects with which users interact is to identify each object and its relationship to other objects. After each data object is given a descriptive name, its relationship is described by the type of data such as text or image or binary value, possible predefined values are listed, and a brief textual description is provided. This collection can be organized for reference into a book called a data dictionary. Data dictionary is a collection of descriptions of data objects or items in a data model for the benefit of people to understand where a data item fits in the database structure, what values it may contain, and basically what the data item means in real world terms.

Audit observed that there were 2,400 tables in the KIFMS Schema, of which only 786 tables were having comments to describe the table. The database development team did not adopt the practice of commenting the tables regularly to briefly describe the content/reason for existence of the tables. Hence the database comments were inadequate to serve the purpose of a data dictionary. Most of the fields in the data dictionary were not explained and the dictionary was not maintained on version control and updated with changes arising from change requests.

***The Department should obtain the text of the standard queries to retrieve specific data from the database complemented by a detailed data dictionary so as to enable the use of K2 data without dependency on the K2 Application.***

### ***3.10.9 Data discrepancies***

Various tables in the application such as the bill header transaction table, bill movement transaction table *etc.*, contain date fields such as forwarding date, receiving date, created date, bill created date and bill updated date. The department stated that bill created date and created date were the same and would remain static while the updated date undergoes changes as the status of bill gets updated. The tables capture the financial year (FY) of the bill creation date as the year during which the bill is created but when a bill is updated, the FY does not always correspond to the year during which it was updated. It was also observed that the FY of certain vouchers was not exhibited as the year during which they were created.

Audit analysis of the above tables showed that;

- there were 9,667 bills which were created during FY 2019-20 but the application considered the FY as 2020-21
- in 21,19,088 records, the updated date falls in FY 2019-20 and was treated as 2019-20 but in 2,47,183 bill records, though the updated date falls in the FY 2019-20 it was not considered as 2019-20
- though 27 vouchers were created during 2019-20, the FY considered was 2020-21. Similarly, nine vouchers of 2019-20 were created in 2018-19
- instances of Bill id absent in Bill Header table but voucher number generated and payment made
- instances of voucher number not present in Bill Header table but entries present in Account General Ledger Master Detail table
- a single bill in the Accounts General Ledger Master table was found to be associated with two different general ledger ids and two voucher numbers
- in 2,025 bills of 2019-20 and 5,025 bills of 2020-21, the voucher was created before the bill by a few minutes (10 to 15 minutes). In all these cases, the bill create date, voucher date and updated date are the same with 00:00:00 recorded as time indicating the possibility of these bills having been created as a batch process during midnight.

Audit observed that the time stamps in the K2 was not handled to ensure data consistency across multiple tables. The different fields in the database capture different time information about the same voucher date. For example, Bill Header table and Payment Details table differ in voucher date timestamp.

The above discrepancies impact the budget and accounting of the transactions and the dependent MIS reports.

### 3.10.10 Design and relationship of tables – inconsistencies

The tables and their columns in the database of K2 constitute multiple fields intending to contain the same information. These tables hold relationship with other entities in the application and should have an attribute to establish a link. The Bill Header Transaction table of the Application is designed to document the main features of the bill entity such as an identification number for each bill, the gross and net amounts of the bill, date of creation of the bill, head of account *etc.* This table has relationships with other entities such as DDO, Treasury and Payment entity.

Audit observed that there were three fields *viz.*, DDO system code, DDO code and DDO id but which of these was sufficient to identify the concerned DDO was not clear. The same scenario was found in the Payment Authorisation Transaction table which provides three columns pointing to the DDO.

Similarly, the Bill Header Transaction table contains two fields – head of account identification and head of account system code. It was not clear whether any one field was sufficient or were both the fields required to establish a relationship. A few examples of inconsistencies in the reference to fields are indicated in **Appendix 3.9**.

The above inconsistencies could result in erroneous choice of fields for validating and reporting purposes.

### 3.10.11 Same field names identified by different data types

Audit observed instances wherein the same identifier names to identify an entity are defined with differing data types in different tables as indicated below:

- DDO code to identify a DDO is defined as a numerical value in 6 tables and as an alphanumeric value in 65 tables;
- Post id is defined as alphanumeric value in 9 tables and as a numerical value in 34 tables;
- Treasury System code is defined as alphanumeric in 1 table and as numeric in 17 tables;
- The postcode in the DDO master table which indicates the post and holds the key to retrieving the roles available to the post does not match with the post code field in the Post details table but matches with the post Id field.

Audit also observed that the field definition and naming practices were not consistent in K2. This impacts data retrieval and could result in wrong outputs. Only an analyst who is aware of the arbitrary variations and counter-intuitive field naming and usage in K2 will be able to arrive at correct results.

### 3.10.12 Counter-intuitive field references and impact on reports

Audit analysis of report design and configurations showed that while CCO fund release and consolidated expenditure report used ‘chart of accounts line item identification’ field to collect rows from the Chart of Accounts Line Item Master table, the CCO fund release and expenditure report for Group Budget Line used the Chart of Accounts Line Item system code. The report developer used the

first field in one report and the second field in the other report. Only one out of these fields is a correct reference since both the two fields are not identical and cannot be interchangeable. However, the department did not furnish to Audit the correct field to refer to the Chart of Accounts Line Item Master table.

### ***3.10.13 Data on projects and schemes***

The State Government operates various schemes and projects which are implemented through the departments and other implementing agencies like the Boards and Corporations. Audit observed that the Application collected details of departments but the information on other institutions functioning under these departments were not captured and mapped to the departments.

Consequently, the details of the various Central Sector, Centrally Sponsored and State Sector Schemes, the nodal departments, implementing agencies, date of their commencement, date of their closure, *etc.*, were not distinctly captured as part of the MDM.

The department stated that classification of schemes has been collected from FD and is being updated. It further stated that details of implementing agencies were not maintained in K2.

The absence of data on implementing agencies rendered the K2 application deficient as it fails to provide a complete picture on the receipts and expenditure under the various schemes implemented in the State.

### ***3.10.14 Repository of fees and charges not available***

K2 seeks to simplify the process of remittance of receipts to Government by introducing Electronic Remittance Mechanism to facilitate ‘Any Where - Any Time’ payment facility. It is, therefore, necessary that citizens are informed about the fees and charges in respect of various services offered by different departments from time to time so as to enable them to compute and pay the fees. This would require a repository of fees and charges as notified by the various departments to be maintained as a Master Data in the System. This would also require Create, Read, Update and Delete (CRUD) facilities for departments to maintain the fee and services repository. Audit observed that such a repository of fee and charges were not available in K2.

### ***3.10.15 Request for proposal requirements for coding standards***

RFP for developing solution design requires the SI to prepare and publish standards to be followed for performing Coding, Customization, Testing, Project Management, Risk Management, Database structuring, SQL Query designing *etc.* It was also envisaged these standard documents should be made available for approval to the department or to its designated nominee, during the onset of the requirements gathering exercise.

The relevant coding standards submitted by SI and its approval by the department was not furnished to Audit. As a result, audit could not ensure whether the design and coding was standardized for K2 based on the best practices.

### 3.10.16 Non-functioning of Kannada version

As per the FRS, the application should provide bilingual support for both English and Kannada wherein English would be the primary medium of communication with the system while Kannada would be made optional for users to opt in case, they intend to use it as their mode of interaction with the system. The data, thus, managed within the system should be in Unicode.

Audit observed that the Kannada version of the application was not functional. The menu panel was empty when the user chooses Kannada as the medium of interaction. Moreover, some of the application labels appeared in Hindi instead of Kannada. Audit also observed that the UATs did not test the conformity of the application with reference to this requirement.

## 3.11 Issues with reports in the application

### 3.11.1 MIS Reports not developed completely

Development of MIS reports was an integral part of the K2 Project. The PMU closely monitors the development and deployment of MIS reports by the SI through periodic status reports in order to ensure that all the planned MIS reports are provided by it.

Out of the 890 reports to be developed in Stage 1 modules only 411 reports were developed up to March 2020, the remaining 479 reports were not developed. As the Stage 2 modules were not developed as of March 2020, out of the 89 reports none of the Stage 2 reports were available in the K2.

### 3.11.2 Generation of inconsistent information

Audit analysis of the status of a bill submitted to Treasury that was later cancelled (Token No. 2005115608 of Karnataka Information Commission belonging to State Huzur Treasury, Bengaluru) showed that the report generated by MIS 004: History of bill/token (detailed report on bill status) and F9 Bill Status (instant search option) was contradicting one another as shown below:

F9 report @ 11.06 AM on 16.02.2021	MIS 004 report @ 11.15 AM on 16.02.2021
Cancelled bill delivered to the DDO with Narasimhappa	Bill Cancelled, pending delivery to the DDO

While these two reports differed from each other as to the location and custody of the bill, audit observed that the DDO had not received the bill and it was actually lying with the treasury and pending delivery to the DDO.

The Government stated (November 2021) that this defect would be fixed.

### 3.11.3 Management Information System Report not reliable

A Management Information System (MIS) Report was provided to Treasury Officers for tracing the history of bill or token. The report had the following deficiencies:

- It could be used to trace only by token numbers and not by bill numbers.

- It does not contain the bill identification or the amount impacting its usefulness to identify issues such as discrepancies in bills or amounts in the bills.
- The same item is repeated in English and Kannada for a few items.
- The complete tracing is not shown in the report unless exported to excel or other formats.
- The number of items in the screen do not match with that of items exported in excel.

As a result, this report cannot be used to trace a bill and is not reliable to trace a token.

#### 3.11.4 Inaccurate reports

K2 provides reports related to fund releases and expenditure details to various roles. Two such reports are Head of Account-wise details report which is available to Project Director role and CCO Fund Release and Consolidated Expenditure Report which is available to CCO role. Audit compared these two reports and observed that the expenditure figures were not matching. An example for two budget lines was provided below from these two reports in **Table 3.7**.

**Table 3.7: Differences in expenditure amount in two reports**

Budget Line	Actual Expenditure as shown in	
	CCO Fund Release and Consolidated Expenditure Report	Head of Account wise details report
2202-01-107-0-09-020-v	34,200	0
2202-02-001-0-04-011-v	4,39,206	0

This was because the Head of Account-wise details report excludes the expenditure incurred by Group of DDOs. Audit also observed that reports provided to Project Director such as fund releases/expenditure, CCO-wise fund details, CO-wise fund details and DDO-wise fund details does not include the expenditure incurred by Group of DDOs. It was not clear whether any UAT was conducted covering these scenarios as the department did not furnish to audit the UAT reports in respect of the above MIS reports. At the instance of Audit, Government stated (November 2021) that Group of DDOs were now added to all expenditure reports, which is subject to be verified during the next course of Audit.

***The Government should ensure that all the MIS Reports are properly tested and audited by a third party.***

#### 3.11.5 Unreliable information mapped to Project Director Role

A 'Fund Allocation/Expenditure' dashboard is available for the Project Director (PD) to ascertain the funds allocated to each department and the expenditure thereof. When a print option of the dashboard is used, 'MIS 027: Fund Released/Expenditure' report is generated. The report generated is entirely different from what was displayed on the dashboard.

For example, there were 40 departments displayed in the dashboard whereas as per 'MIS 027: Fund Released/Expenditure' report, there were 41 departments,

the additional department being the Range Forest Office, Ramadurg which is not a department but a unit of the Forest department. Though expenditure figures ranging from ₹5.62 lakh to ₹43,161.96 crore were exhibited in the dashboard against all the 40 departments, the underlying MIS report exhibited expenditure figures for only 17 departments. The expenditure against the other 24 departments were shown as '0'. **Table 3.8** below shows the difference in figures exhibited as per dashboard and as per MIS report.

**Table 3.8: Difference in figures exhibited as per dashboard and MIS report**

Narration	As per dashboard (₹in crore)	As per MIS (₹ in crore)	Difference (₹in crore)
Funds received by all ADs	1,08,362.61	18,095.70	90,266.91
Expenditure incurred by all ADs	73,806.94	386.97	73,419.97

Thus, the information provided to the PD significantly varied from dashboard to MIS report. Audit also observed that while DDO level information was available to the PD, the consolidated information at CCO, CO and AD levels was exhibited as '0'.

(i) The PD has a dashboard panel 'Fund availability' but the dashboard displays 'No budget line found' message in the login screen. The dashboard provided a link for viewing the budget lines with a title 'See all budget lines'. When the user moves to 'See all budget lines', a 'MIS 033: Fund Availability' report opens and the details regarding a budget line (8658-00-102-6-14-000) is displayed. This information is again not uniform with the information displayed on the dashboard and the information displayed in the MIS report.

(ii) The PD also has a 'Bill pendency' dashboard. Audit observed that when the PD role tries to open it, the message 'Error While Loading Dashboard... Please try Again' is displayed.

Thus, the information mapped to the PD role was unreliable.

The Government stated (November 2021) that a production defect had been raised and the fix was in progress.

***The Department should initiate action to develop all MIS reports which are consistent, reliable and accurate.***

### 3.11.6 Issues in Jasper Reports

K2 uses a separate reporting software (Jasper) and database for generation of various reports. It was observed that in one instance during October 2020, the ACR009-Detailed Head wise compiled accounts report of Hubballi sub-treasury sent to AG (A&E) contained the figures of Dharwad Treasury.

The Department attributed this discrepancy to the manual process involved in the updation of the post name and location name of the users in Jasper database. The Jasper database was not synchronised with K2 database for facilitating an automatic real-time updation of Jasper database.

Audit is of the view that such manual updation of data into reporting software poses the risk of incorrect reports being generated. The department needs to automate the updation of the reports software as and when changes occurs in the K2 database.

### ***3.11.7 Deficiencies in translating Functional Requirement Specification to System Requirement Specification with respect to MIS reports in Budget Control Module.***

Budgetary Control refers to the continuous comparison of actuals with Budgeted Estimates to carry out early remedial action, if necessary. The FRS document for K2 provided for the system to generate various MIS reports for all the modules. Section 5.8 of the Budget Control Module provided for developing MIS reports which included Statement of releases – demand-wise, department-wise, HOA-wise, district-wise, DDO-wise or for any of these combinations.

Audit observed that the SRS did not provide for generation district-wise fund release reports and the reports with different combinations as specified in the FRS. Failure to translate the FRS requirements into SRS, thus, resulted in reduced and inadequate MIS functionalities.

There existed deficiencies in mapping of these MIS reports also. Demand-wise reports, though required at FD level was not provided but instead was mapped to CCO and Administrative Departments. Similarly, MIS reports related to fund releases were mapped to Reports Treasury Network Management Centre (TNMC) user and not mapped to any active user in K2. No details were provided to ascertain whether these MIS reports were subjected to UAT.

The Government stated (November 2021) that though district-wise report was not part of SRS, it has been developed and mapped to CCO role. Audit observed that these reports were not working in the application as shown in **Appendix 3.10**. Similarly reports with multiple combination of inputs were not developed. For example, it is not possible to generate district level department-wise expenditure reports. Also, the application does not have reports with different types of charts, dashboards *etc.*, as envisaged in FRS.

### ***3.11.8 Non-consideration of reduction in expenditure in MIS Reports.***

In case of unpaid/undisbursed amounts, DDOs remit back the expenditure amount by generating a challan. These were to be booked as reduction in expenditure under the respective expenditure Heads of Accounts. A total of 1,05,243 challans valuing ₹909.93 crore were remitted as reduction in expenditure for the period of 2016-2020 (up to date of Audit Database set up). Thus, the actual expenditure in these cases is the expenditure by way of vouchers minus reduction in expenditure by way of challans. However, K2 does not consider these deductions for generating expenditure reports such as 'BDC 009-Fund release and expenditure reports at FD', 'BDC017- Fund release and expenditure reports at AD' *etc.*

Analysis of the underlying queries of these reports showed that these reports do not consider the reduction in expenditure and exhibited the entire expenditure

booked originally by way of vouchers resulting in these reports exhibiting inflated expenditure figures.

The Government stated (November 2021) that this procedure is part of the proposed AG Module. Audit is of the view that delay in implementation of module has impacted the overall capability of K2 in providing a reasonable assurance to its stakeholders. Hence, module deployment is to be expedited.

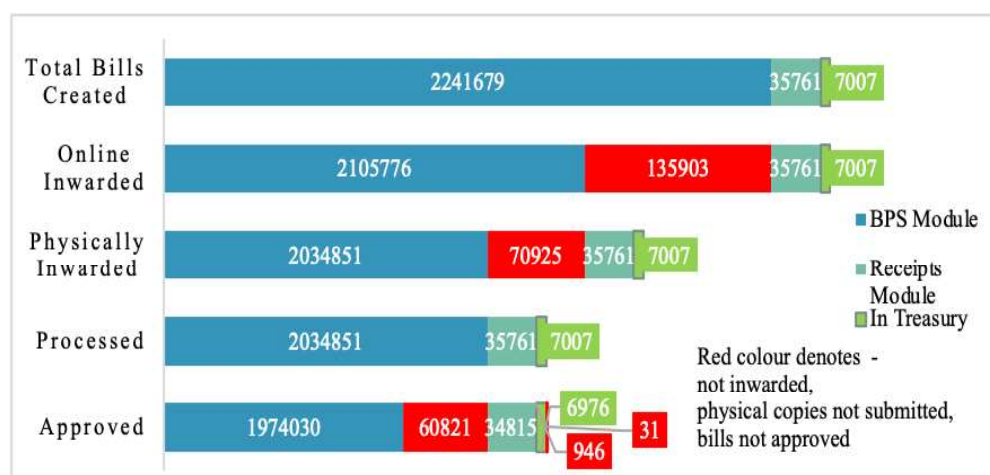
### 3.12 Analysis of bill cycle from creation to approval at Treasury

A bill containing the claims against the Government are presented to the Drawing and Disbursing Officers (DDO) who are authorised to draw funds from the Government account. In K2 a caseworker in DDO office initiates the bill processing. The bills created by caseworkers are verified at various levels and submitted to treasury online after approval by DDO. After receipt of the physical copies of the bills from DDOs, the treasury processes these bills at various levels and authorises the payment to the recipient.

No timelines were specified in K2 for processing the bills at various stages. However, the bills could be pushed to priority queue based on their urgency but the processing time in the normal queue and priority queue was not indicated. Audit, therefore, adopted the timelines of 15 days as specified (August 2018) by the Central Vigilance Commission for processing the bills as the benchmark.

The data available showed that K2 processed a total of 44.66 lakh bills during the period 2014-15 to 2019-20 (**Appendix 3.11**). Bills in K2 are mainly processed through Bills Processing and Submission (BPS) Module. However, some bills such as revenue refund bills get processed at the Treasury without entering the BPS. Audit attempted analysis of the data to understand the time taken for processing bills for payments using the bill status information available. It was observed that K2 does not have a facility for capturing the date of actual submission of bills by the claimants. Hence, the actual time taken for initiating the process since submission of the bill could not be determined.

Audit, therefore, analysed the cycle a bill goes through from its creation up to its final payment for the year 2019-20 to arrive at the time taken for processing the bills for payments. A total of 22,84,447 bills were created, of which 22,41,679 were through the BPS module, 35,761 were from the Receipts module and 7,007 bills were originated in the Treasury itself. The status of bills created during 2019-20 is indicated in **Chart 3.9**.

**Chart 3.9: Status of bills created during 2019-20 in K2**

It can be seen from the Chart that 1,35,903 bills created in BPS were not submitted to the Treasury. The reasons attributed were DDO rejected, CSO rejected, pending at intermediary stages, year-end cancellation *etc.*

The manual transmission of the bill continued to be part of the K2 System. The Treasury processes the bills only after receipt of the physical copies of the bills from the DDOs though the bills are submitted online as the system does not provide for capturing the digital images of the vouchers. At the treasury, FOA inwards the physical bills. The system automatically rejects the bills at the FOA level if the physical submission is delayed by more than seven days. A provision was made wherein the system would prompt the DDO through registered e-mail and mobile messages before 24 hours prior to expiry of the set time limit (excluding the day of online bill submission) if the physical bill had not been received in the front office of the Treasury. There were 70,925 bills for which the physical bills were not submitted indicating that either the prompting mechanism had failed or the DDOs had ignored the prompts.

Thus, a total of 20,77,619 bills were available for processing at Treasury. Of these 20,15,821 bills were approved and 61,798 bills were rejected, objected or cancelled. It was observed that the bills which were objected by treasury and cancelled by DDO thereafter were reflected under the status 'Bill rejected by DDO'. Thus, the break-up of the unapproved bills could not be analysed as the bill status description was not adequately defined.

The time taken for each stage - online submission of bills by DDOs since its creation in BPS; for submission of physical bills after online submission; for approval by Treasury since its receipt and the total time taken for processing a bill from its creation to its approval is indicated in **Table 3.9**.

**Table 3.9: Time taken for online and physical submission of bills by DDOs and approval of bills by Treasury**

Time taken	Number of bills submitted		Bills approved	Number of bills
	Online	Physical	Treasury	Bill creation to approval
<b>0-7 days</b>	14,77,637	20,17,030	19,31,687	10,23,666
<b>8-15 days</b>	3,25,187	17,742	71,624	5,79,199
<b>16-30 days</b>	1,88,808	59	8,213	2,76,026
<b>31-60 days</b>	83,353	15	1,641	1,04,822
<b>61-180 days</b>	29,166	5	348	30,955
<b>181-360 days</b>	1,569	0	23	1,142
<b>361 and more</b>	56	0	0	11
Total	<b>21,05,776</b>	<b>20,34,851</b>	<b>20,15,821</b>	<b>20,15,821</b>
	Maximum time taken = <b>668 days</b>	Maximum time taken = <b>73 days</b>	Maximum time taken = <b>303 days</b>	Maximum time taken = <b>474 days</b>

While there were delays at each stage of the bill process, there were 17,821 bills (rows indicated in orange colour) which were accepted by the system though the stipulated period of seven days had lapsed in these cases. This indicates that the front-end controls were bypassed, and the bills accepted and processed. Interestingly, the number of days allowed for submission of physical bills was hard coded in the application and not entered through front end and fetched from a table as envisaged in the SRS. In the absence of interface to edit/set the time limits, the changes made in the specified number of days for submission of a bill and the persons making the changes were not traceable.

A total of 4,12,956 bills (rows indicated in red colour) were processed after the benchmarked period of 15 days and the maximum time taken for processing a bill that has passed through all stages successfully was 474 days.

The Government stated (November 2021) that it has a Key Performance Indicator for bill processing and is set as three days. It also added that it is not in the scope of K2 to follow up on time taken to process a claim in the DDO office. The bill status description is clearly defined in simple English for common understanding of DDO users.

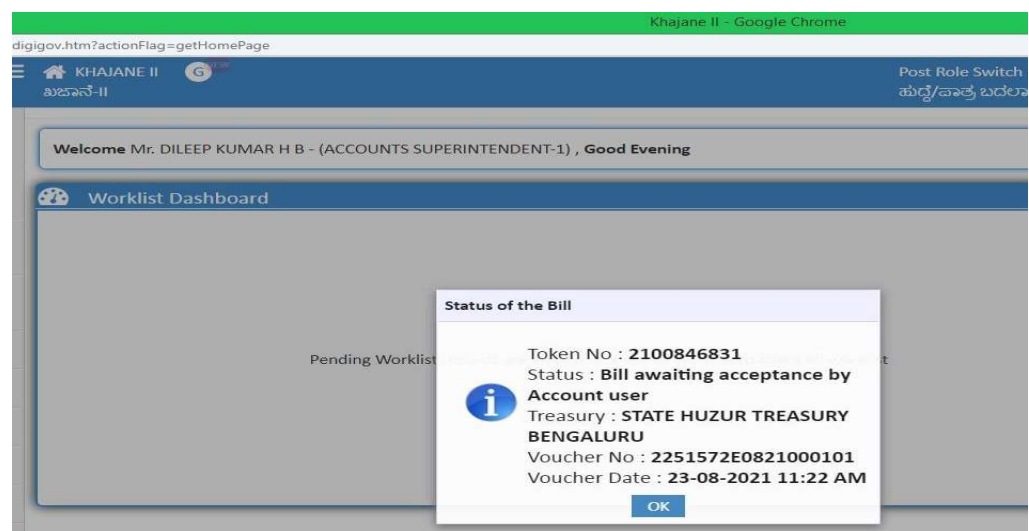
Audit has elucidated an instance of lack of clarity in status descriptions brought out in paragraph 3.13. Though a 3-day timeline was specified for bill processing, there were no analytical reports in K2 for monitoring this performance indicator. K2 being an Integrated Financial Management System should specify the timelines for the entire life cycle of a bill starting from submission of claim by recipient to its approval and payment.

*The State Government may bring out a code of practice prescribing the timelines to ensure speedy processing and prompt payment of bills to its suppliers and watching of pending bills so as to enable K2 to incorporate in the application.*

### 3.13 Inadequate status description of bills

A transaction status provides information about a transaction throughout its life-cycle from initiation to completion. The final status of the transaction could be a successful or failed transaction. Each bill in K2 passes through a life-cycle from its creation to approval and thereon to payment. K2 captures the bill status in the bl\_movmt\_txn table that shows the position of the bill in the application. There are 71 status descriptions in the master list categorized under two types, one for reporting to DDO and other for reporting to Treasury users.

Analysis of the status description data showed that it does not include a field for recording the final status about success or failure of the payment. For instance, even a Bill finally paid to the recipient is displayed to the DDO user as ‘Bill awaiting acceptance by Account user’ as shown below. Thus, the information provided to DDO does not bring clarity and is not actionable.



K2 provides a Report titled ‘BS023- DDO Bill Status’ for DDOs for viewing the bills status. Analysis of the underlying query for this report showed that bills with voucher number (Bills approved) were shown in this report under the title as ‘Bills approved/paid’. Providing a status like ‘Bills approved/paid’ does not distinguish paid bills from approved bills. Even a failed payment gets classified under this ‘Bills approved/paid’. Thus, the different class of users in K2 including the DDOs who initiate the bill processing, do not get any meaningful information about the final payment to the intended recipients.

The status descriptions created in K2 were, therefore, not well defined and do not give sufficient information to DDOs and other users about the actual status of the bills at various points in its life-cycle.

***The Government should ensure that sufficient status descriptions are defined and provisions for communicating the statuses for various stakeholders such as DDOs, Recipients etc., are put in place.***

### 3.14 Failed payments

Prompt payment to suppliers, employees and social security scheme beneficiaries is not only an ethical responsibility but economically beneficial for all parties and the wider economy. Delay and failed payments result in

destruction of vendor relationships, diminution of public trust on Government and have a ripple effect on business and finance and public accountability. Best practices require organisations to monitor the failed payments, reprocess them quickly after correcting the errors and to complete the payments. This requires establishing a framework to track the turnaround time (TAT) of the bills from its receipt into the department to its final settlement through payment. K2 had not developed any framework for monitoring TAT for bills including failed transactions.

A 'failed transaction' is one which has not been fully completed after its initiation. In K2, failed payments refer to the payment authorisations that gets returned to DDOs when money could not be finally credited to the recipient account. The payments fail due to wrong account number, incorrect IFSC code, incorrect account type, wrong recipient name *etc.* The Accounts Compilation and Reconciliation Module in K2 receive the details of failed e-payments and in turn notifies the DDOs concerned along with the reasons for failure for correction and re-processing. The amount corresponding to the failed e-payment would be credited to failed e-payment suspense heads of accounts. These would be cleared as and when failed payments are reprocessed, paid and accounted. The year-wise details of failed payments are shown in **Table 3.10**.

**Table 3.10: Details of failed payments for the period 2015-16 to August 2020**

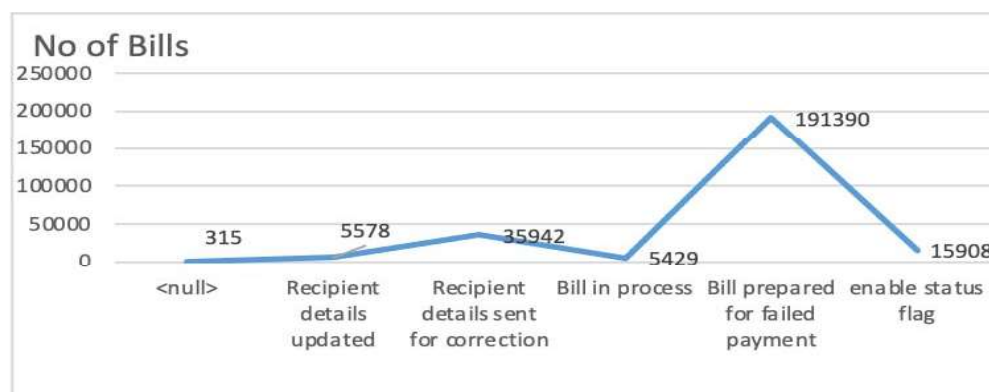
(₹ in crore)

Year	Total bills requiring payment	Total Individual recipients to be paid	Number of recipients for whom payments failed	Amount involved	Percentage of recipients whose bills failed
2015-16	10,155	44,587	434	2.20	0.97
2016-17	3,71,009	25,44,254	14,015	158.52	0.55
2017-18	5,30,139	24,35,078	20,970	318.75	0.86
2018-19	9,86,230	43,66,477	57,064	426.96	1.31
2019-20	19,72,276	1,06,18,772	1,20,211	682.07	1.13
2020-21*	5,84,253	43,55,881	41,868	117.16	0.96
Total	<b>44,54,062</b>	<b>2,43,65,049</b>	<b>2,54,562</b>	<b>1,705.66</b>	<b>1.04</b>

\* Up to August 2020.

During the period 2015-16 to August 2020, payments involving ₹1,705.66 crore were failed to a total of 2.55 lakh recipients, of which the payments failed for 1.54 lakh recipients was due to incorrect account numbers. This points to the need for validating the bank account details in the recipient master at the time of registration. Further, the failed payment data does not include the failed payments under bulk recipient system<sup>18</sup> used for distribution of social security pensions, scholarships *etc.*, as the data was not captured in K2. The description of status of the failed transactions as stored in the table BS\_FAILED\_PAYMENT\_DTL is indicated in **Chart 3.10**.

<sup>18</sup> In this system, a single designated recipient like Post Office or an authorised Bank receives the amount in bulk for further re-distribution to large number of beneficiaries.

**Chart 3.10: Status description of failed transactions**

Analysis of the failed payments showed that out of 2.55 lakh failed payments 1.91 lakh (75 per cent) were reprocessed (Bill prepared for failed payment) and 0.63 lakh (25 per cent) were not reprocessed. The amount of ₹116.32 crore pertaining to these non-processed instances (**Appendix 3.12**) continued to remain in suspense head of accounts.

The status description 'enable status flag' had 15,908 bills and as per the department, this referred to time-barred bills cancelled from the application because of their expiry to prevent them from reprocessing. This status, however, had failed payments pertaining to 2019-20 and 2020-21. Though there were bills pertaining to 2015-16, they were not cancelled. The reasoning behind this discrepancy was not explained. It was also not clear whether the amounts of these cancelled bills were withdrawn from the suspense heads.

Audit observed that the time taken for reprocessing and approval of the bills from the date of failure took on an average 56 days, with the maximum taken being 1,161 days.

#### **Illustration**

***A DDO initiated a payee's receipt bill (Bill Id -1412576333) during March 2018 for a net amount of ₹ 7,84,000. The payment failed on 24 March 2018. The new bill for this amount was created only on 9 July 2019 after 1 year 3 months. The re-processing bill initiated was approved on 13 November 2019 after a delay of four months. The total time, thus taken for re-processing the bill from its failure was 1 year and 7 months (599 days).***

Apart from this, audit observed that a total of 15,914 failed payments bills involving ₹131.17 crore failed again. Best practices encourage communicating the reasons for rejections to the right person who can initiate corrective actions. K2, however, did not have a mechanism to notify/inform the recipients of the failure of payments and the reasons for such failure, which if done, would facilitate timely reprocessing of failed payments.

The Government stated (November 2021) that DDOs receive notification and SMS once a payment failed, and failed transaction appear in a separate work list of the Superintendent of the office. Each treasury has a distinct head of account for failed payments under major head 8658 and there was no scope for failed

payments to be made from any other head of account. The reply is not acceptable as Audit noticed that there were delays in creating the failed payment bills as indicated below in **Table 3.11**.

**Table 3.11: Time taken for creation of repayment of failed bills**

Time taken for re processing by superintendent.	Number of bills falling in the time window starting from payment failure date to new bill creation
0- 7 days	55,600
8-15 days	27,430
16- 30 days	29,559
31- 60 days	30,359
61 - 180 days	37,582
181- 365 days	9,041
more than 365	1,771
<b>Total</b>	1,91,342
<b>Range</b>	0-1,086 days
<b>Average</b>	48 days

Analysis of the reprocessed cases showed that in 20 instances, the bills were reprocessed more than once (19 bills – twice and one failed payment – thrice) resulting in excess payment of ₹4.06 lakh in these cases as detailed in **Appendix 3.13**. It was also observed that in two cases, the reprocessed bill creation date was earlier than the failure date. Such discrepancies affect the reliability of the data. Moreover, there was no front-end report for DDOs or other supervisory level officers linking the new bill and the failed payment bill rendering it difficult to monitor the failed payments.

Audit also observed that ₹10.53 lakh was debited from other heads of account instead of the suspense account. Such erroneous debits overstate the expenditure on these heads of accounts while leaving the failed payment suspense account not cleared to the extent.

In case of failed payments under major head 8658, audit noticed that the failed payments were made under other heads of accounts and it was already pointed out in the Audit.

***The Government should ensure that a report for DDOs for closely monitoring the status of reprocessing of failed payments is provided. Timelines may also be prescribed for reprocessing of the failed payment bills.***



## **Chapter IV**

# **Project Security**







Information Security relates to the protection of information assets against the risk of unauthorised access, operational discontinuity, misuse, unauthorised disclosure, modification or damage. Information is considered as valuable assets of the organisations and should therefore be protected by ensuring Confidentiality, Integrity and Availability.

#### 4.1 Policies not formally approved and adopted

Regarding the overall Information Security Environment, the K2 Project

- (i) developed an Information Security Management System (ISMS), Information Security Policy and Information Security Procedures which are deliverables as part of the contract with the SI.
- (ii) contained guidelines for Backup and Data Retention
- (iii) merged Business Continuity and Disaster Recovery (DR) into a single functionality as set out in the Disaster Recovery Plan.

The K2 set up a disaster recovery site to serve the purpose of business continuity and disaster recovery. A Security Operations Centre (SOC) was also set up for security monitoring and incident management.

These Policies were to be reviewed and approved by the senior management for use in the project. The approval and acceptance of the documents prepared by the SI and the consultants for guiding the security operations, identity and access management was not made available to audit.

The Government stated (November 2021) that the documents prepared by SI had been vetted in the Technical Committee meetings.

The fact remains that the stamp of approval and acceptance of the documents for use in the project was not formalised.

***The Government should ensure that established policies/guidelines are approved and periodically reviewed to enhance the security systems in place.***

##### 4.1.1 Determination of strategic control levels

The guidelines issued (2010) by Government of India mentions that Departments shall ensure Strategic Control over the e-Governance projects so as to enable the Department to have a complete control over the Strategic Assets like software application, databases and core infrastructure to ensure the capability of exit management. This includes expressing the Security Category (SC) of software application based on potential impacts to the organization. The Strategic Control category could be defined by considering the attributes such

as exposure to National Security, sensitivity of Governance workflow, criticality of data and information and the extent of financial exposure *etc.* The RFP of K2 project also envisaged a strategic control framework for review of the K2 application, database and network activities by Security Administrator from Government side and by a third party Auditor.

Audit observed that the strategic control level of K2 was not determined by assessing the sensitivity and significance of K2. A security incident management plan for identifying, recording, analysing and reporting of the security threats or incidents in real-time was also not prepared.

The security administrator envisaged as part of the K2 strategic framework was not deployed. Capability of the K2 system to respond to the security incidents were not demonstrated as the disaster recovery plans were not tested for its capability to switch over within the specified recovery time and point objectives.

#### 4.1.2 Inadequate Security Audit

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Section 43A of Information Technology Act, 2000 and Rules thereunder require the conduct of security audit by an independent auditor duly approved by the Central Government at least once a year or as and when significant upgradation of the infrastructure happens. Similarly, the guidelines issued by GoI on Data Centres (DC) advocate getting the security preparedness of the Data Centres audited by third party expert periodically (once in six months). The Security Audit should cover application, hardware, software and network components, security policies and their implementation, reviewing of the activities performed by management team, reviewing the access controls, reviewing the health check results, reviewing on the uptime of the services. Audit observed that the third party Security Audit of K2 covering application, network components was not conducted periodically.

The department stated that security audits were conducted eight times (Vulnerability Assessment and penetration testing - 3 times, web application security - 3 times, Firewall review-1, Audit of Application-1) during the period 2015- 2021. Scrutiny of the Security Audit reports showed that security audits covered only audit of web application security, the penetration testing and vulnerability assessment but did not cover the entire application, network and database security policies such as application functionalities, network components, access controls and data centre security. Since the periodicity and coverage of the Security Audit was insufficient, Audit was not in a position to derive assurance on the robustness of the security controls over the K2 application.

## 4.2 Identity and Access Management

Identity Management (IM) involves establishment and maintenance of user identities (IDs), associated authentication and monitoring processes to provide assurance that only authorized users are granted access to the system. Unique user identity also ensures that no user can repudiate a past transaction, *i.e.*, the individual assigned to a particular user ID can be held accountable for the activity performed with that ID. K2 uses Biometrics and a Digital Signature

Certificate (DSC) based authentication mechanism to establish identification and non-repudiation.

K2 uses Role-based access control (RBAC) mechanism for permitting access to different classes of users. This involves setting permissions and privileges to defined roles and assigning the roles to various authorised users. Thus, the role determines which permissions the system grants to the users and limit access to specific resources or tasks.

#### 4.2.1 Biometric Access

K2 employed biometric technology as part of the access control. An individual's measured biometric characteristics are compared to a database of authorized individuals to verify identity of the person who she/he claims to be. The biometric data of a K2 user should be mapped to the identity of the user within K2 and on successful validation of both; the user shall gain access to the system.

The Department stated that the False Acceptance Rate (FAR)<sup>19</sup> of the biometric device used in K2 is < 2% and False Rejection Rates (FRR) is 0.01%. However, the mechanism instituted for monitoring the performance of the biometric system, the analytical and monitoring reports in respect of the biometric sub-system, the reports on de-duplication of users based on biometric data *etc.*, were not available. These reports are important to monitor the devices and to ensure that FAR and FRR are within the prescribed limits.

Though, the daily users of K2 performing day to day operations were to be authenticated with biometrics, it was observed that the department users of K2 were not covered under biometric identification process. Excluding the department users from bio-metric authentication process thus resulted in a gap in the envisaged authorisation procedures.

#### 4.2.2 Digital Signature Certificates

K2 adopted Digital Signature Certificates (DSC)<sup>20</sup> as part of its user identification and authorisation mechanism. K2 procures and distributes DSCs to all users and also permits use of DSCs issued by other departments of the Government. Maintenance of DSC mechanism include monitoring their validity, renewal before expiry, removing defunct DSCs safely, responding to forgotten passwords *etc.*

##### 4.2.2.1 Delay in renewal of DSCs

A valid DSC is necessary for users to work with K2 and their timely renewal is vital to ensure smooth continuity of application usage. The MDM module captures and uses the DSC information user authentication. Audit analysed the

<sup>19</sup> FAR and FRR are the primary metrics for gauging the performance of a biometric system.

<sup>20</sup> DSCs are the electronic format of physical or paper certificates. DSCs serve as proof of identity of an individual for a certain purpose and can be presented electronically to prove one's identity, to access information or services or to sign documents digitally. DSCs are issued by a licensed Certifying Authority (CA) designated under Section 24 of the Indian IT-Act 2000. The Certifying Authorities are authorized to issue a DSC with a validity between one to three years.

data of 16,137 DSCs renewed during the period 2017-20 and noticed delays in renewal ranging from one day to more than 1,000 days. This was because the mechanism for monitoring the expiry of the DSCs was weak and K2 does not automatically initiate the renewal of DSC on the basis of prior information available on the validity of the DSCs issued. The MIS reports on DSCs were inadequate as it did not notify about the DSCs approaching expiry from time to time. Help desk data indicate instances of users seeking renewal of DSCs after expiry. It was also observed that in 617 cases the posts were delegated to other users citing DSC related issues. This reflected on the inefficiencies in DSC processing by the department.

The Department needs to monitor the expiry of the DSCs and renew the DSCs in time since without DSC the K2 users would not be able to perform their roles in the K2.

The Government stated (November 2021) that the DSCs are generally processed within three days of receipt of application by K2 PMU. Though Audit accepts Government response, there have been instances of delays beyond three days period up to 1,000 days and causes for such delays were not analysed. Audit also noticed delegation of posts has happened because of issues in DSCs which has to be resolved.

#### 4.2.2.2 Difference in allotted and actual DSCs

K2 provides an MIS report 'Department-wise Number of Digital Signature Certificate (DSC) issued'. The figures as per this report did not match with the actual DSCs in use as per K2 database as indicated in **Table 4.1**.

**Table 4.1: Difference in allotted and actual DSCs**

Sl. No.	Financial Year	No. of DSCs issued		
		As per MIS report	As per database	Difference
1	2014-15	05	24	19
2	2015-16	1,054	2,644	1,590
3	2016-17	2,227	4,719	2,492
4	2017-18	1,373	2,819	1,446
5	2018-19	24,535	21,714	2,821
6	2019-20	13,080	14,065	985
7	2020-21	02	5,468	5,466

Source: Information as per MIS Reports and database

Variation in figures corresponds to unreliability of the database and absence of controls over maintenance and handling of DSCs. This can impact the authenticity of the transactions carried out using the DSCs.

#### 4.2.2.3 Indented objectives of digital signature not achieved

As part of security requirements, the RFP states that the department intends to maintain highest level of integrity and responsibility fixing within the system and considers the need to remove any ambiguity in the authentication process by employing biometrics along with Public Key Infrastructure (PKI) towards this purpose.

Audit observed that a defined and documented sequence of steps was not available with the department to prove that a transaction was indeed signed by the signer in the event of the signature being contested or denied. It was observed that the digital signature process did not cover the entire voucher information including recipient name, bank account number *etc.* Audit further observed that the fields storing the Digital Signature Information were empty in respect of 225 fund releases transactions involving an amount of ₹26.74 crore undertaken during the year 2019-20. Thus, implementation of the digital signature process was insufficient to provide an assurance on non-repudiation and data integrity.

### 4.3 Privileged accounts not appropriately managed

Privileged accounts such as super user accounts present a high risk because of their level of administrative access. These super users may have virtually unlimited privileges, or ownership over a system that allows them to read/write/execute privileges, create or install files or software, modify files and settings and delete users and data. They may be able to change firewall configurations, create backdoors and override security settings and erasing traces of their activity. Organisations looking to protect super user accounts implement certain policies to regulate these accounts and document the controls implemented in the system to control privileged user activities.

The Department had neither established a procedure for Privileged Identity Management or Privileged Access Management nor had documented the need for such policy or procedure.

The Government stated (November 2021) that it was proposed to deploy a Privileged Identity Management solution to review the user access.

The Department needs to lay down processes and policies to control super user activities, periodical reporting of super user activity to PMU/appropriate representative of K2 management, policy in place to enforce separation of duties, password policy and the processes in place to monitor and audit all super user sessions.

***The Government should ensure that K2 recognise the need to assess the access levels of super user accounts in the production environment and periodically review them for appropriate use.***

### 4.4 Sharing of user credentials with helpdesk

Accounts shared with multiple users increase the risk of unauthorised access. K2 employs Single Sign On (SSO) as an authentication method. The SSO method allows users to use a single ID and password to access multiple software application services at the same time. This eases the burden of memorizing and entering passwords multiple times. In such an environment, it is highly important that organisation discourage the practice of password sharing amongst its employees to avoid exposure to password security vulnerabilities.

Audit observed instances of password sharing between users and helpdesk representatives as part of the helpdesk activities such as:

- Helpdesk team seeking User Credentials (User ID and Password) for resolving tickets.
- Users sharing their user credentials to the helpdesk team through portal/mail.

Such instances of sharing user credentials with helpdesk poses security threats.

The K2 should institute procedures resolving user issues without compromising the user credentials by providing controlled access to the help desk personnel using their own credentials. Disclosing user credentials undermines the fundamental principles of identity management and non-repudiation and is fraught with high risk in a financial management system.

The Government stated (November 2021) that this is a user awareness issue and users were advised not to share credentials with anyone.

Audit is of the view that considering the sensitive nature of the user credentials, Department needs to create awareness among the users and the helpdesk team as it impacts authenticity and non-repudiation of data.

#### 4.5 Transactions by suspended/retired employees

All employees are mapped to their respective DDOs/CO/CCO. They should be de-mapped from the previous office and re-mapped to the new office through the process of check-out / check-in at the time of transfer/promotion/suspension/retirement/death. In all such instances, the DDO/CCO/CO has to report to the treasury with the Karnataka Government Insurance Department (KGID) number of the employee for check-out/check-in. When an employee is promoted/ transferred within the same DDO/CCO/CO office, he has to undergo the process of check-out of his old post/designation and check-in with his new post/designation. An employee who is transferred from another DDO/CO will have to check out from that DDO/CO and check in at the new office he is reporting and the DDO/CO/CCO of the new office will have to map his KGID number with DDO code. Simultaneously, a parallel check-out/check-in process called transfer out/transfer in should be carried out in HRMS. However, the process does not spell out the steps to be taken to handle cases of suspension/retirement/death.

Audit analysis of front-end screens and database showed that HRMS application was not fully integrated with K2. K2 fetches the data from HRMS while registering users. Non-integration of HRMS application for sharing data on a real-time basis thus adversely impacted the ability of K2 to manage the user access. The Department also needs to issue instructions for timely notification of the events like suspension, transfer *etc.*, of the employees and users and update the applications in time.

##### 4.5.1 Transactions by suspended employees

The HRMS application captures both the suspension and revocation of Government employees. However, the data does not get updated automatically as integration between the two applications was yet to be completely achieved.

K2 captures the suspension of an employee with the DDO, where the user (suspended employee) is posted, sends a request through a letter to the treasury linked to their office to de-activate the user in the application. The employee is then de-activated through the module for Employee Transfer/Retirement/Suspension. Each posting, retirement, suspension entry has to go through an Organogram maker, verifier and approver to ensure a three-point check mechanism.

Audit analysis of the front-end screens showed that the system asks for separate notification date, order number and order date during addition of suspension records. The 'date of effect' field in the front end screen is frozen to the current date, and thus cannot be edited. The entry then passes through the Organogram verifier, before finally being approved by the Organogram approver. Moreover, the system was designed in such a way that the notification date and order date were to be earlier than the date of effect. It was observed that:

- 150 users had all the three roles *viz.*, maker, checker, approver and 205 users at least two of these roles, thus vitiating the separation of duties mechanism.
- there were three and five cases respectively where notification date and order dates were later than date of effect indicating that there were no validations on these fields.
- there were 22,201 cases where the notification date is earlier than order date; 4,866 cases where order date is earlier than notification date and 17,991 cases where they have the same value.

Since the requests from DDOs are sent through hard copies and not through K2, the person requesting the suspension and date of actual request is not captured in K2. In 254 cases there were suspension orders but no corresponding revocation orders and in 36 cases, there were revocation orders but no suspension orders. A total of 44 users were found to have both suspension and revocation orders, of which 10<sup>21</sup> users had processed 55 bills of various types worth ₹81.95 lakh.

K2 also allows transfer of suspended employees through the employee transfer module. Audit analysis showed that the transfer was allowed even when the suspension order was active. The transfer process revokes the suspension status of the user automatically, which should not be allowed in the system. Though the user may not be able to transact without posts being assigned to him after suspension, the assigning of posts can be done inadvertently as the Treasury user would now see the user as an 'active' user. There were 254 cases where the suspended users were transferred without revoking the suspension.

#### 4.5.2 *Transactions by retired employees*

A script in the System is run manually on last day of every month to deactivate employees who retire on superannuation. Audit observed that the script checked if the current date was past 60 years from the date of birth of any employee and if the script conditions were satisfied, the status of the record was

<sup>21</sup> Audit considered the later of the notification date and order date as suspension date and the earlier of the two for reinstatement date.

deactivated and the system date inserted in the updated date field of related tables (org\_user\_mst, org\_emp\_mst, ifms\_emp\_post\_wf\_mpg, ifms\_emp\_mst, org\_emp\_post\_mpg, ifms\_employee\_details\_hrms\_mst tables). However, it did not consider the conditions of retiring the employee on the last day of the previous month when the date of birth falls on first day of the month.

Analysis of the Employee Master table showed that a total of 10,144 records were found to be deactivated as of August 2020. While 8,783 users were deactivated within time, 1,361 users were deactivated with an average delay of 62 days. Such delay in deactivation resulted in continued usage of K2 application even after their superannuation and 166 users had processed 4,967 bills for ₹2,412.15 crore during the interim period between the date they were supposed to be deactivated and the actual date of deactivation.

It was also observed that for 2,039 records, the updation date which represents the date of deactivation was null. The system did not record the reasons for deactivation. While audit could determine the reasons for deactivation as superannuation in majority of the cases based on their date of birth, in respect of 802 records which were deactivated before the superannuation date of the employee, the reasons for deactivation were not verifiable from the data available in K2.

Ideally, the application should not allow the deactivated user to transact. It was observed that 4,938 bill transactions involving ₹154.57 crore were carried out by users after they were deactivated, of which 3,867 transactions took place during 2019-20. This was possible because all the relevant tables were not updated which allowed the users to login to the application.

***Illustration***

***Shri Sudarshan K.S., Assistant Director, Education Department (User Id: 1232495467) born on 1 June 1960 was to retire from service on 31 May 2020. The user had processed 47 bills during July 2020 amounting to ₹4,54,194.***

Issues with the database design were also noticed. The organogram employee master table contained fields for capturing date of termination, date of demise, date of resignation but there was no field for date of superannuation. The organogram user master table contained user Id -1 with username K II ADMIN which was deactivated on 16 January 2018. However, several transactions were carried by user Id -1 even after the date of deactivation. It was observed from the year end transactions script that user Id -1 was inserted for the users forwarding and receiving bills and created by and updated by fields for transactions de-activated on last day of the year. Since the scripts use -1 as Admin user, one would never know whether the transactions were done by the user K II ADMIN or done through scripts through backend. There was also no report providing the data of employees working/superannuated in an office within K2 for DDOs for viewing and verification.

***The Government should ensure that K2 automates controls over predictable events such as superannuation and to institute procedures for timely updation of information.***

## 4.6 User permissions not reviewed

K2 does not have either a mechanism to regularly review privileges and access to the system or a System Use Policy provision that require regular internal audits on all aspects of user access and use of K2. Audit noticed that the system cannot produce a report to assist with verifying whether the roles of its users are appropriate to the functionalities and job roles in the Department. In the absence of review of user access, there is an increased risk of unauthorised and inappropriate access remaining undetected.

***The Government should ensure that K2 periodically review the user access to verify that only legitimate users have access to applications or infrastructure.***

## 4.7 Data protection

Data protection is the process of safeguarding important information from corruption, compromise or loss. It is a set of strategies and processes used to secure the privacy, availability, and integrity of the data. It is sometimes also called data security or information privacy. A data protection strategy is vital for any organization that collects, handles, or stores sensitive data. A successful strategy can help prevent data loss, theft, or corruption and can help minimize damage caused in the event of a breach or disaster.

### 4.7.1 Data Retention

The Department was to formulate an appropriate Data Retention Policy (DRTP) to be guided by data classification and risk assessment of data, data retention period, data security aspects, disposal of data once the retention period is over and ensure that the data centre architecture supports the DRTP.

According to MSA, the Department planned to retain transactional data for a period of 10 years within the live database. The data for the period prior to 10 year retention period should be kept in an aggregated form in a separate database. The type of aggregations to be created over the data was to be identified by the SI and documented as part of the SRS document.

Further, the SI was required to backup all historical data prior to 10 years and remove them from the live database and should also restore the same as and when required by the Department.

It was observed that the Department is yet to formulate a Data Retention Policy and data sharing policy. Absence of the Data retention and data sharing policy is indicative of the non-recognition of the importance and potential use of the data available with K2.

The Government stated (November 2021) that the Data Retention Policy was under development.

## 4.8 Security and Incident Management

Enterprise Security has become increasingly vital for organizations and is critical for financial and accounting information systems. It refers to the process or actions an organisation follows to protect the data and information in their information systems. Enterprise security management involves identifying all associated risks, the required controls to manage the risks and preparing a

program to implement the controls. The program should provide for security architecture governance, policies and define physical security architecture.

#### 4.8.1 Critical Information Infrastructure

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Information Technology Act, 2000 defines Critical Information Infrastructure (CII) as a computer resource, the incapacitation or destruction of which, shall have debilitating impact on national security, economy, public health or safety. The Information Technology (National Critical Information Infrastructure Protection Centre (NCIIPC)<sup>22</sup> and Manner of Performing Functions and Duties) Rules, 2013 mandates that the basic responsibility for protecting CII system shall lie with the agency running that CII.

The NCIIPC has identified the Government among others as critical sector and laid down guidelines for identification of CIIs based on a set of parameters such as the total number of transactions per day, the value of all types of transactions per day, number of connected devices and network size, number of customers of different categories *etc.*

Keeping in view the above parameters, K2 qualifies to be identified and notified as CII. Audit observed that the department was yet to assess the criticality of the system and take measures to notify K2 as a CII under GOI guidelines. This deprived K2 project of an enhanced security infrastructure commensurate with its significance and criticality. The State Government stated (November 2021) that it would initiate measures to notify K2 as CII and place information security controls commensurate with the elevated status of importance.

#### 4.8.2 Asset and Inventory Management

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The NCIIPC brought out (January 2015) guidelines for protection of CIIs according to which one of the most important steps in the critical assets management and security is asset and inventory management which correlates all the physical and virtual critical assets owned by the CIIs. An asset inventory is important for managing maintenance, servicing, theft prevention, controlling system builds, performing regular audits/reviews, replacing faulty systems and discarding/destroying/auctioning older/faulty systems. Absence of this control makes it difficult to formalise the access control list of the software and hardware to be used in the operation of the CII and implementation of information security policies and security controls.

Best practices require that periodic review of the hardware and software inventory must be ensured, movement of equipment/digital media from/to the project infrastructure, especially sensitive areas must be adequately controlled, and assets discarded/replaced/auctioned after updating the inventory and obtaining authorisation from the management.

The Government stated (November 2021) that the review of IT infrastructure at every treasury office was done by inspection teams periodically. The movement

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<sup>22</sup> NCIIPC is an organisation of the Government of India created under Sec 70A of the Information Technology Act, 2000 and designated as the national nodal agency for Critical Information Infrastructure Protection vide Gazette Notification G.S.R 18(E) dated 16 January 2014.

of IT infrastructure are captured in stock book during entry and exit at every treasury office.

The Department, however, did not provide the stock registers maintained and the related reports of periodic stock verification conducted in respect of these assets. Therefore, Audit could not derive an assurance about the correctness and completeness of these documents and their physical availability.

### 4.8.3 Security Vulnerabilities

#### 4.8.3.1 Server hardening and disclosure of database user Id and password

K2 uses Jasper-Soft Server for generating reports. Audit analysis of use of Jasper Server showed that it was installed with default administrator login credentials (user name jasper-admin and default password Jasper-Admin). As a result, any non-administrative K2 user could log into Jasper Server as administrator using these credentials. Such logins could abuse the privileges of the administrator login by deleting report files, tampering with report design resulting in incorrect reports, etc.

Further Jasper Server being a report generation tool, it needs to query and retrieve data. Hence, it has to be populated with the credentials to access the production database. The default credentials for the jasper server administrator login permits any K2 user to learn the credentials for accessing the production database. This nullifies the password secrecy of the production database.

Audit demonstrated (9 September 2020) the poor server hardening of Jasper Server, which exposed the credentials recorded within the server for accessing the database to Additional Director and Joint Director of K2.

The Jasper server was configured to use a privileged user account instead of a restricted user account with read only access. This violated the principle of least privilege needed for the activity and increased the risk arising from the exposure of the credentials.

***The Department needs to prepare an inventory of hardware and software components and their interconnections besides documenting their vulnerabilities. The Department also needs to put in place appropriate measures to safeguard the software and hardware components.***

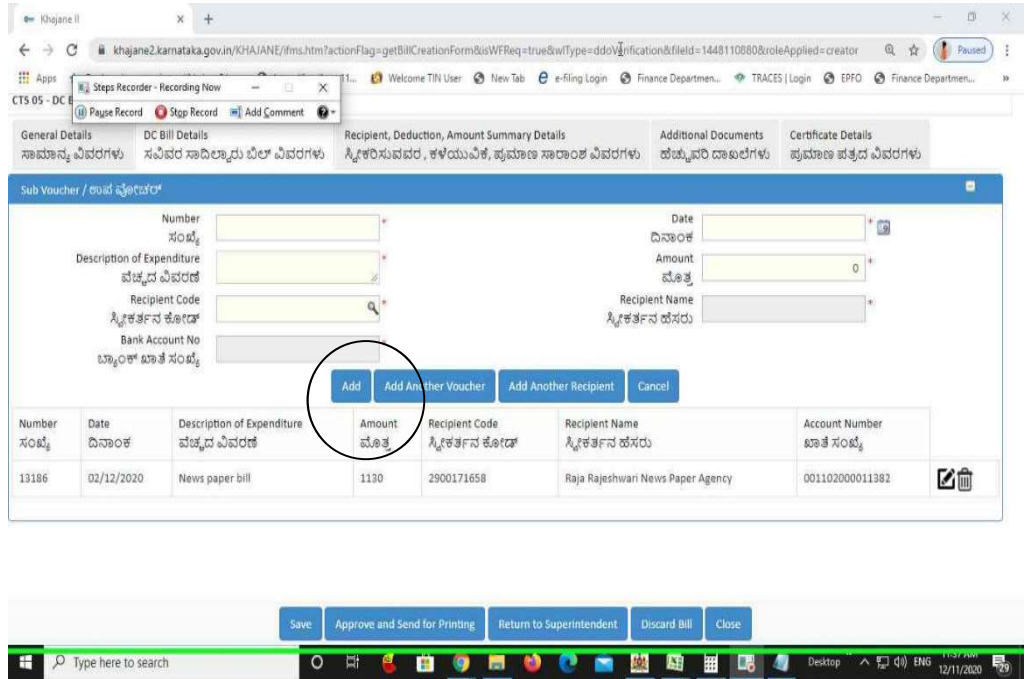
#### 4.8.3.2 Modification of bill details after online submission

Audit analysed the bill creation and submission functionality in the Office of the Karnataka Information Commission and observed that the application does not implement restriction of access to functionalities appropriately based on the timelines of events and sequence in the workflow of bills. This is termed as broken access control.

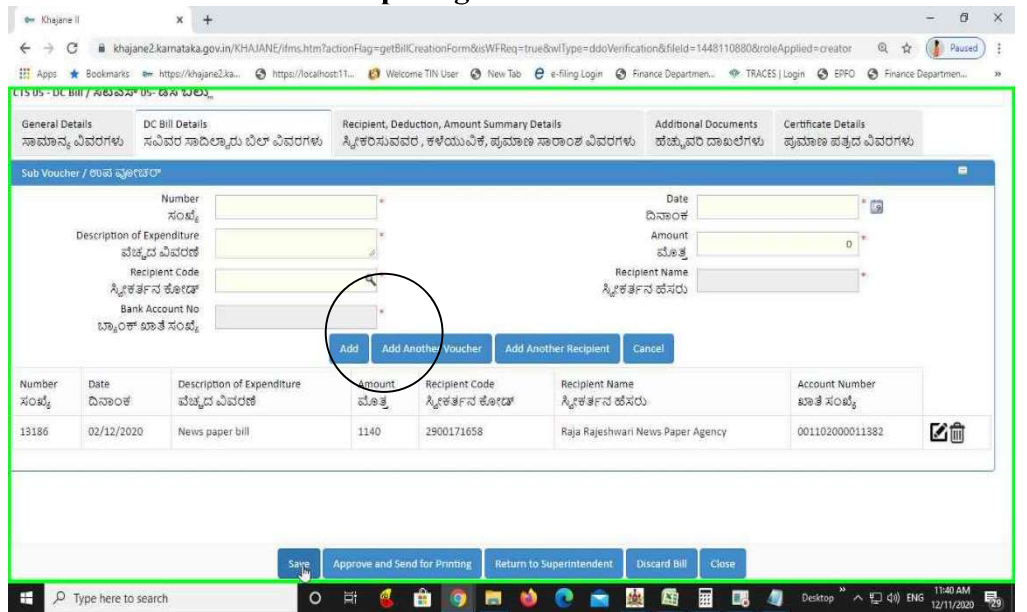
The gap in security was demonstrated (December 2020) through modification of the bill amounts (two bills) from the case worker role after online submission by the DDO to the Treasury. The screens as seen by the treasury officials showed the altered amounts revealing that the application does not consider the bill as digitally signed and submitted by the authorised officer – the DDO, but processes the tampered figures submitted by the caseworker. This shows that

digital signatures are not used to ensure the veracity of the figures being processed.

**Screenshot of bill before tampering**



**Screenshot of bill after tampering**



Audit also observed that the system allowed vertical escalation of privileges as the caseworker could assume the role of Superintendent, DDO, and CSO to pass the bills and forward them to the Treasury. A bill with token number No.200556592 with bill Number AD2009116951 for ₹1,620 was created (Caseworker role), verified (Superintendent role) and approved (DDO role) by a user (Accounts Superintendent) who had only caseworker and superintendent roles mapped to him in the system.

The testing environment provided to audit further showed that the system was vulnerable to alteration of Form 62B<sup>23</sup> after the payment was made. The above demonstrated vulnerabilities exposed the system to risk of manipulation of bills and Form 62B.

The SI requested (June 2021) a further demonstration of the vulnerability. Accordingly audit again demonstrated (July 2021) the security vulnerability of the application to the SI through a video meeting facilitated by the department by handholding a case-worker in the office of the Commissioner of Treasuries. The process and sequence of steps for a caseworker to exploit the vulnerability and undertake the activities of superintendent and DDO and countersigning officer by altering the URLs and submitting unauthorised requests to the application and the location of the hidden file handle which is used for crafting the new URLs was shown. The response of the application was shown and the application permitting the case-worker to modify the bill amount unauthorisedly was also demonstrated. A new bill was created for this purpose for an amount of one lakh rupees and the amount was altered to two lakh rupees by tampering.

The Government replied (November 2021) the issue had since been analysed and resolved. However, audit observed that the vulnerability persists and the tampering of bills was possible even as of date (November 2021).

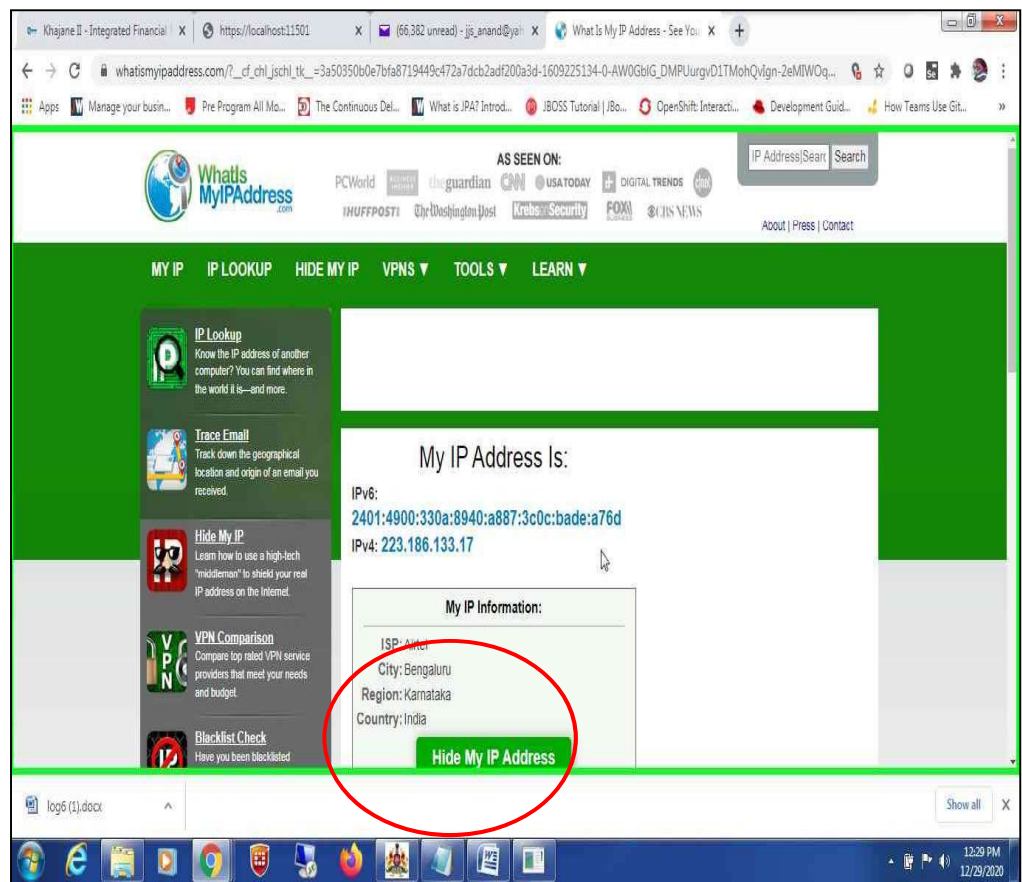
***The Department should undertake a review of all critical user interface(s) for server validation and also implement validation controls. The patching of the vulnerabilities should be properly tested and verified for their effectiveness before releasing the patch for production.***

#### 4.8.3.3 Ineffective restrictions on treasury logins

The Treasury staff who work in treasuries to process the bills form one set of users of K2. These users are connected by KSWAN and are not allowed to work from home or elsewhere other than from the treasury. Audit, however, observed that the application does not prevent the Treasury Staff from working using personal devices through personal internet.

Audit also observed that the application does not serve the menus for doing different Treasury tasks when a Treasury user logs into K2 outside KSWAN as these are provided only when the treasury user logs in through KSWAN. However, this restriction was only superficial as Audit demonstrated the process of logging into K2 and carrying out Treasury tasks through personal mobile internet connection and laptop by circumventing this restriction in State Huzur Treasury, Bengaluru. Screenshot indicating the use of personal network (Airtel) and treasury transaction carried out is provided below.

<sup>23</sup> KTC 62B report provides the details of monthly expenditure head of account wise done by the DDO.



## 4.9 Business Continuity and Disaster Recovery Plans

In K2, the BC and DR aspects are combined into a single functionality as Disaster Recovery Strategy that lays down the approach to be adopted in the event of a disaster. It is also important that these strategies/plans are tested periodically for their efficiency and effectiveness. Periodic testing provides for rapid recovery of computer systems in the event of an unplanned disruption affecting business operations and services. The senior management should monitor that plans are developed and tested in accordance with the risk profile and appetite of the department.

### 4.9.1 Testing of Plans

According to MSA, BC strategy/plan should comply with zero data latency, *i.e.*, the Recovery Point Objective (RPO)<sup>24</sup> for the database would be zero minutes. A latency of 10 to 30 minutes was permitted before the business continuity starts functioning fully. However, a K2 Disaster Recovery (DR) drill conducted on 8 December 2018 took about 188 minutes for the above process. As per the Drill Activity Report (DAR), the task 'DSC signing at Bill forward and approval level' had failed. The DAR recommended reduction of switchover time to recovery, adequate URL redirection to ensure no changes to the end users and external agencies integration and Virtual Machines Software setup. The quarterly drills to verify readiness and effectiveness of the DR arrangement

<sup>24</sup> Duration for which data loss is tolerable, which in K2 is '0' minutes.

were not conducted in 2019-20 and 2020-21. This undermined the assurance to Government about the capability for successfully resuming operations in the event of a disaster.

The Government stated (November 2021) that the Department is planning to conduct DC-DR drill once in quarter to ensure effectiveness of the drill and to ensure that all K2 services, which are running from DC site, can run from DR site.

#### 4.9.2 Disaster Recovery Site

According to RFP, the department proposed to have a single location for the data centre and a single location for BCP and DR. Best practices advocate that the sites should be far enough apart that they are not subject to most of the same risks to avoid a single disaster event taking down both the sites. However, audit observed that the two locations are in the same geographic location within a distance of one Kilometre.

The Government assured (November 2021) that DR site of a different State Data Centre (SDC) would be used as Far-DR and existing DR site would be used as Near DR to ensure that DC and DR sites are geographically separated.

***The Government should expedite the implementation of the Far DR setup at the proposed site to cover the risk of DC and DR being affected by the same event and undertake periodic DR drills.***

### 4.10 Obsolescence Management

IT assets are characterised by rapid obsolescence. An Obsolescence Management plan will include a variety of different elements such as technology roadmap, identification of criticality of components, monitoring all components *etc.* Use of outdated or obsolete technology were to be avoided as far as possible in critical systems. The department did not have a plan to monitor the obsolescence of various assets procured from installation to its end of support.

Audit also observed that documentation created as part of handing over during 2019 was not updated and does not capture the alterations in the system design or new interfaces to other systems (internal and external). Absence of a clear understanding of system interfaces and functionality increases the risk of system failure in the event of changes, incidents or a disaster recovery event. There is also the additional risk of inappropriate access to information by exploiting weaknesses in the interfacing systems.

The Government assured (November 2021) that the department would draft an obsolescence policy for handling IT assets reaching obsolescence.

### 4.11 Exit Management

Every project should have an Exit Management Plan to facilitate a smooth, effective transition of services delivery, minimum disruption of ongoing delivery, and efficient completion of all agreement obligations including legal enablement in case of an exit of the vender whether premature and planned. Audit observed that K2 did not have a formally planned, approved and adopted

Exit Management Plan. This increases the dependency on the vendor and affects the business continuity in case of exit by the vendor.

The Government of India guidelines on Strategic Control over e-Governance Projects considers the Exit Management Plan as one of the measures to achieve strategic control over e-governance projects. Though the MSA recognized the importance of Exit Management and provided for it, the department did not enforce this part of the contract thus exposing the K2 to the risk of disruption of services in the event of exit by the SI.

The Government assured (November 2021) that K2 would prepare a detailed Exit Management Plan.

# Chapter V

## Monitoring and Evaluation





# 5

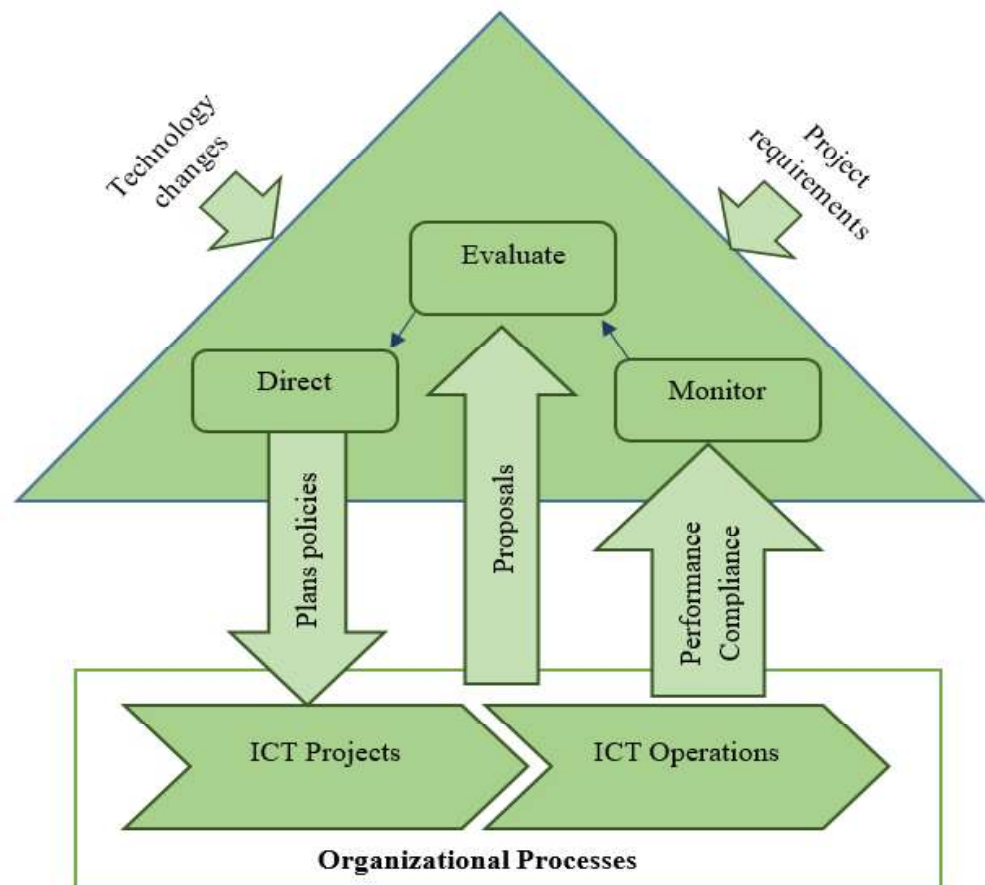
## Chapter

# Monitoring and Evaluation



Handbook on e-Governance Project Lifecycle (2012) of Government of India states that it is imperative for the organizations to monitor and track achievement of stated project objectives and benefits throughout the lifecycle of the project. The quality of monitoring has a major impact on the extent to which effectiveness, efficiency, asset safeguarding and data integrity objectives are achieved in a project environment. Governance ensures that stakeholder needs are evaluated to determine balanced and agreed-on project objectives; direction is set through prioritization; performance and compliance are monitored against agreed-on directions and objectives as depicted in **Chart 5.1**.

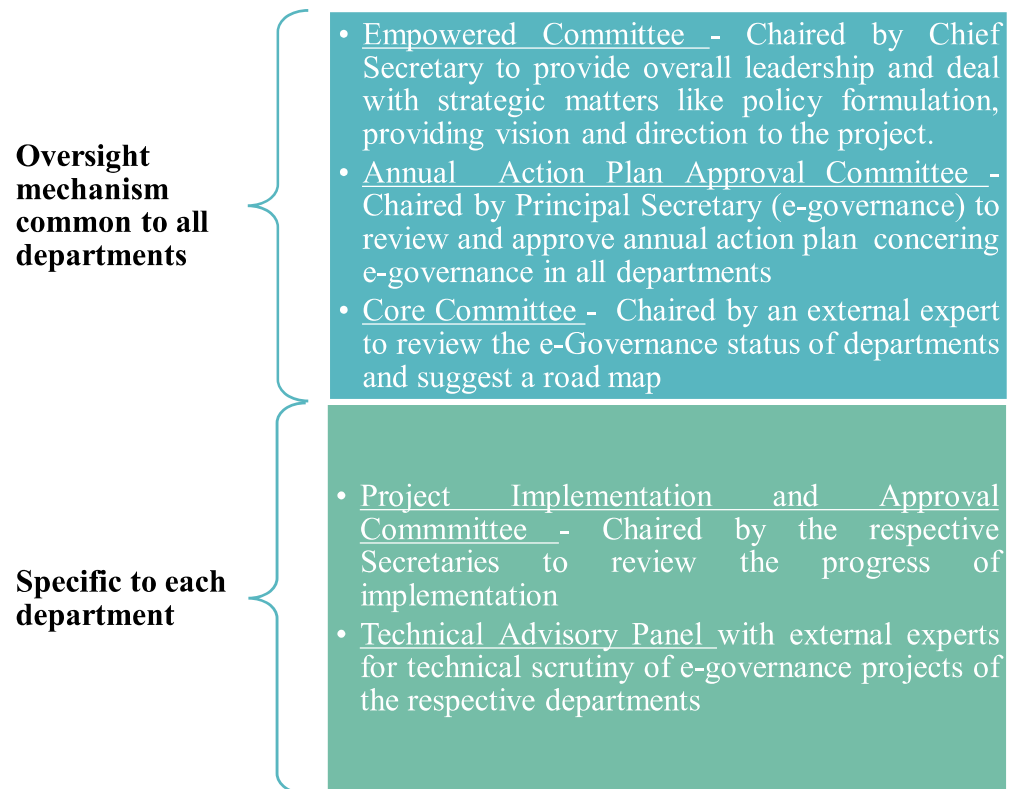
**Chart 5.1: Governance of Information & Communication Technology**



(Adopted from the ISO 38500 Model for Governance of IT)

## 5.1 Framework for IT Governance

Government of Karnataka had put in place an ecosystem for approval and monitoring of the e-Governance projects in Karnataka which included the following:



Further, in view of the functional and technical complexity of K2 project and its geographic coverage, the State Government constituted (October 2009) a Steering Committee (SC) to provide guidance and policy direction, address any inter-departmental and inter-agency coordination issues during project implementation and to accord approval to the deliverables. A Technical Committee (TC) was constituted (October 2009) to assist the SC and was responsible for providing high level technical guidance during project implementation besides reviewing the function and security compliance audit reports. Both these Committees were to interact with the SI on a periodic basis. As per the information furnished to Audit,

- The SC held 12 meetings during the eleven-year period (2010-2020) as against the requirement of one meeting per quarter.
- The TC met 25 times during the eleven-year period (2010-2020) period as against the requirement of one meeting per quarter.
- Only 3 TC and 1 SC meetings were conducted during the crucial period of 2012-2015 as all software development timelines including the project completion timeline were stipulated during this period.

The important deliverables to be approved by SC after review by TC and by TC after review by the PMU is shown below:

<b><u>To be approved by SC</u></b>	<b><u>To be approved by TC</u></b>
<ul style="list-style-type: none"> <li>▪ Project Plan document</li> <li>▪ Risk Assessment and Mitigation Document</li> <li>▪ Change Management Plan</li> <li>▪ IT Infrastructure sizing documents for primary and BCP/DR site</li> <li>▪ Requirements Traceability Matrix</li> <li>▪ Warranties and Licence Document</li> </ul>	<ul style="list-style-type: none"> <li>▪ Systems Requirement Study/Specifications Documents</li> <li>▪ Detailed System Design Document</li> <li>▪ Training Plan</li> <li>▪ Standards Documentation</li> <li>▪ Testing Approach and Plan Document</li> <li>▪ Test Cases and Results</li> <li>▪ Software &amp; Hardware</li> <li>▪ Digitized Records</li> <li>▪ System Operations &amp; Maintenance Manual</li> <li>▪ User Manual</li> </ul>

Audit observed that the SC and TC did not deliberate on the acceptance and approval of these deliverables by the SI in any of its meetings. Further, the procurement process and MSA required several important documents which required higher level consideration and technical approval as part of the project implementation. Scrutiny of the deliberations and minutes of the TC and SC meetings showed that the following documents were not considered and approved.

- ✓ Detailed Solution Technical Architecture
- ✓ Detailed Security Policy based on ISO 27001 standard
- ✓ Network Administration Policy
- ✓ System Administration Policy
- ✓ Exit Management Plan
- ✓ Data Migration Plan
- ✓ Communication Management Plan
- ✓ Incident Reporting Policy
- ✓ Backup and Recovery Policy
- ✓ Access Control Policy
- ✓ Preventive Maintenance Plan
- ✓ Quality Assurance Plan (as per IEE 730)
- ✓ Detailed Architecture Plan for DC& DR
- ✓ Pilot and Rollout execution Plan
- ✓ Upgrade path and plan for OEMs

In the absence of a specific approval by the designated committees, the documents submitted by the SI remain unauthenticated. Thus, the Governance framework established for overseeing the implementation of K2 was rendered ineffective, which led to prolonged delay in rolling out individual modules as discussed earlier and non-completion of the project even after a decade. Moreover, lack of a formal review and adoption by the committees charged with governance would undermine the credibility of these documents and their acceptance by the stakeholders.

## 5.2 Strategic Plan and Annual Action Plans not prepared

Taking into consideration the technological advancements, economic and social trends as well as the current and future organisational objectives that must be achieved, the DoT was expected to prepare a long-term strategic plan document indicating the strategies, proposals and supply arrangements, their evaluation and achievement monitoring together with the annual action plans which set forth the direction for providing funds for IT projects and operations.

The DoT did not furnish to audit any such documents which discusses the direction of the Department covering the IT aspects.

The Government stated (November 2021) that K2 evolved and incorporated all the latest technical advancements. Audit is of the view that long-term strategic plan document and annual action plan would facilitate orderly implementation of the e-Governance initiatives, in absence of which the incorporation of the technical advances will not materialize effectively.

*The Government may ensure that K2 may consider preparing strategic plan to demonstrate and document the direction of the project that evolves with changing technology landscape.*

## 5.3 Risk Management not documented

IT risk is a business risk specifically associated with the use, ownership, operation, involvement, influence and adoption of IT within the project. IT risk management is the process to continually identify, assess and reduce IT related risks within the levels of tolerance set by Project Executive Management.

The Information Security Management System (ISMS) Risk Assessment Methodology shared by the department provides for identifying and classifying assets, valuing the assets, analyzing the assets, estimating the expected loss due to risks and categorizing the risks. However, it was observed the process of identifying and classifying assets, valuing the assets, estimating expected loss due to risks was not undertaken. The risk register shared by the Department did not have the details of its approval and review by the Project Management.

The Government stated (November 2021) that the Department had initiated the process for internal audit for ISO 27001 certification and the agency engaged for the purpose shall develop an Enterprise Risk Management Framework and carry out risk assessment.

## 5.4 Performance indicators not specified and developed

Relevant Key Performance Indicators (KPIs) form the cornerstone of effective public sector performance reporting and are fundamental to public accountability. Audit observed that the Department had neither developed and adopted any performance indicators for monitoring the various activities of K2 project nor did it conduct any evaluation of the project during the implementation stage.

The Government stated (November 2021) that the KPIs were specified for the Treasury Department. Audit is of the view that the KPIs for monitoring the

performance of various activities of K2 such as user registration, recipient registration, reprocessing of failed payments, DSC renewal, accounting of receipts after receiving RBI scrolls, could be specified.

***The Government may ensure that the Department prepare a catalogue of services offered by K2 to various stakeholders and specify KPIs and monitor the performance.***

## 5.5 Project Evaluation

Project evaluation is the quality assurance mechanism that involve an assessment of a planned, ongoing, or completed programme to determine its relevance, efficiency, effectiveness, impact and sustainability.

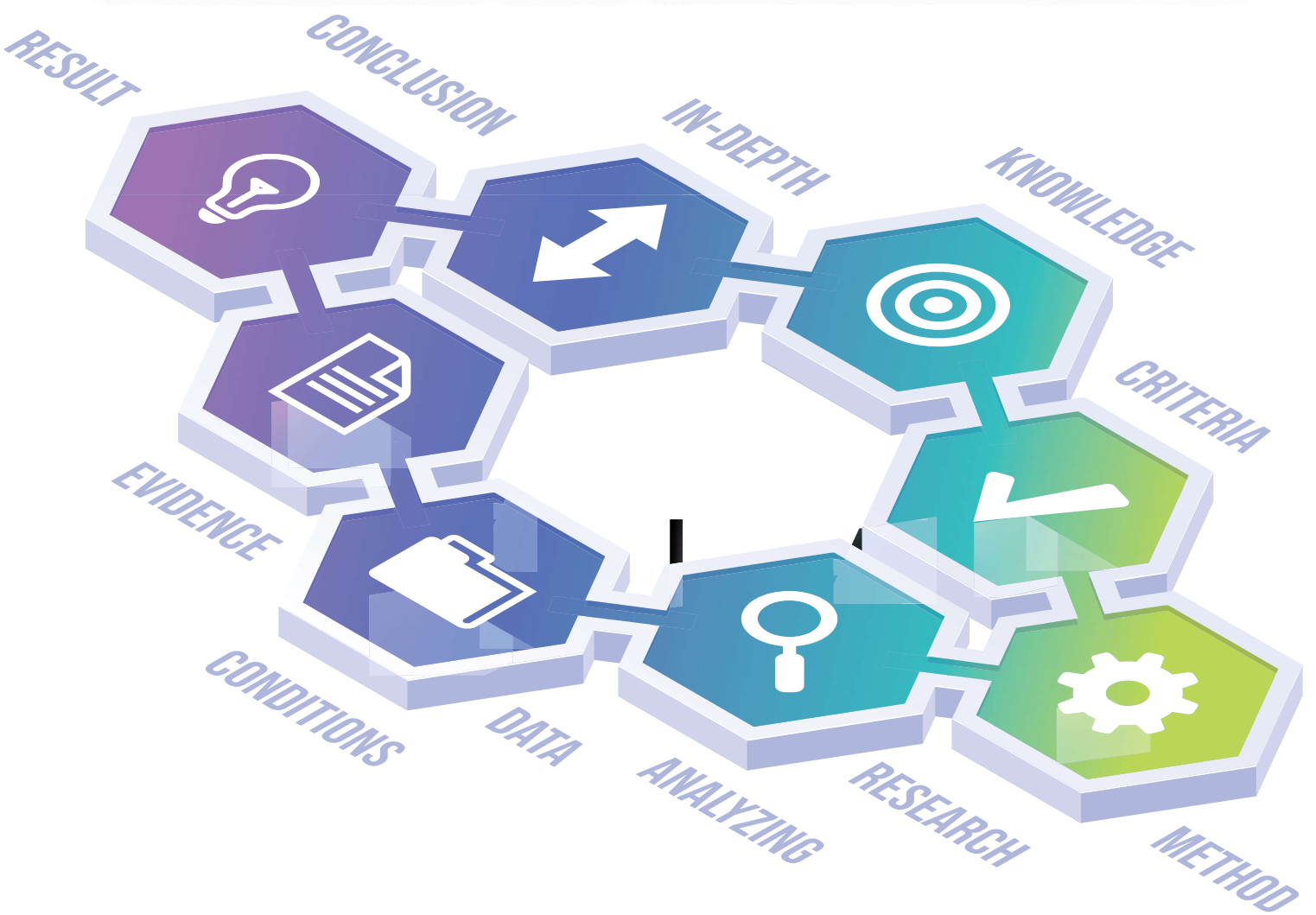
Though the Project was closed from February 2019 and the department entered into a new O&M contract with the SI, no efforts were made to undertake a post completion evaluation of the project. It also failed to institute a mechanism to review the project to assess the achievement of planned objectives. Audit noticed that the SI continues its non-compliance even during the second contract such as delayed submission of the performance guarantee, non-setting up of the SLA measurement tools *etc.*

The Government stated (November 2021) that since the project was continued with the same vendor, the closure activities were not charted out. It also stated that the continuation of the second term has been conditional on the deliverables of first contract. The fact, however, remains that the deficiencies and learnings from the previous contract was not internalized and appropriate clauses to control the contract better were not used in the second contract. Therefore, the contractual lapses continued to occur and could derail the effective implementation of K2.



# Chapter VI

## Conclusions and Recommendations





# 6

## Chapter

# Conclusion And Recommendations



### Conclusion

#### Project Management

The Project was yet to implement all the planned business processes into the K2 Application and as a result several processes still remained outside the K2 Application. There was non-revision of financial codes, non-undertaking of the business process re-engineering *etc.*, which led to continued reliance and dependency on the manual operations. The capability to support the implementation of the Indian Government Accounting Standards remained limited as the associated business rules were not made part of the application. The MSA was originally entered into adopting a Waterfall Model of Application Development with specified milestones for delivering Application in two phases, the project completely deviated from the agreed development model and timelines rendering the contract redundant. The department failed to safeguard the project from vendor lock-in scenario due to which the O&M contract was further extended as per the SI's terms and conditions. The O&M was extended without considering the delay in development and roll out of modules. Though the deployment of SLA monitoring tools were an important component of a technology project, the vendor did not deploy the tools yet. The quality of the service delivered by the SI was, thus, not measurable. The agreement was not revised to accommodate the extension of time. The department deployed the project without subjecting it to third party audit and testing.

#### Project Implementation

The K2 was yet to build the capability for tracking expenditure through the years as the expenditure tracking module was not operational. Tracking funds drawn on grant-in-aid bills and grants drawn on payee receipts bills were not facilitated as there was no provision of utilisation certificates. The Go-live dates and delivery expectations in the original agreement were materially altered and the department did not freeze the time and cost needed for completion of the Project. Inaccuracies in MIS reports generation, input errors arising out of insufficient application controls *etc.*, were also observed. The modules deployed were deficient as several envisaged processes were yet to be rolled out. Inordinate delay in implementation necessitated continued parallel operation of K1 resulting in capturing of financial data in two separate silos with no interconnectivity thus, limiting the capability of the K2 to provide comprehensive financial information to the top management to support their

decision making. Instances of Application producing inconsistent information through reports undermined the reliability of the outputs.

### **Project Security**

The security weaknesses noticed in the Application have the potential to expose critical financial information to inappropriate access and therefore, poses the risk of compromising the confidentiality and integrity of the information. Though online exchange of data with encryption and digital signing was introduced, the procedures for establishing the non-repudiation was not in place. Absence of sanction order information, sub-voucher information coupled with deficient DSC implementation renders the vouchers created under the K2 incomplete and insufficient to replace the manual transmission of vouchers. The Project continued to employ manual workarounds and back end inputs exposing the Application to associated risks of data integrity and reliability. Lack of timelines for processing of the bills, re-processing of the failed payments, *etc.*, affected the efficiency of Application System.

### **Monitoring and Evaluation**

Efficient allocation of budgetary resources and their monitoring were impaired as the activities related to re-appropriations, surrender of funds *etc.*, were handled through manual processes. The K2 was not capable for an end to end monitoring of amounts drawn from public funds to its final utilisation. There were gaps in submission of final expenditure details for the amounts drawn in the nature of advances through bills. Instances of processing of payments multiple times, non-accounting of payments, *etc.*, were observed pointing to inadequate reconciliation procedures. The Master Data around which the Project operations are conducted were not completely captured and kept updated. Monitoring of the Project at the Government level lacked vigour as evidenced by the lack of periodical timely review of the project by the empowered committee during the crucial period of project implementation.

Thus, the K2 Project proposed as an improvement over K1 with ambitious objectives, was yet to be fully developed and deployed. The implementation of K2 continued to be a challenging ongoing activity for the department even after 10 years of its initiation. The Application was yet to mature into an Integrated Financial Management System infused with capabilities of supporting various functions in the Government financial sector.

## **Recommendations**

*The following recommendations are made:*

### *State Government:*

- ❑ *The Government should expedite the revision of the financial codes to reflect the changes in financial processing practices brought out by the K2 Application and also to facilitate the electronic transmission of vouchers.*
- ❑ *The Government may ensure that K2 provides appropriate IGAS functionalities for facilitating the compliance to IGAS.*

- ❑ *The Government may develop suitable guidelines for software development projects by incorporating the learnings from the failures of the contract management of K2.*
- ❑ *The Government may adopt best practices related to configuration management, strategic control, identity management, source code ownership, etc.*
- ❑ *The Government should ensure the completion of the integration processes with important applications like e-Procurement, HRMS etc., to derive the envisaged benefits.*
- ❑ *The Government should prescribe closure procedures for software development projects to secure the proper delivery and mutual acceptance of the project deliverables.*
- ❑ *The Government may specify/adopt Government of India guidelines regarding the implementation of periodic security and application performance audits.*

#### **Project Director:**

- ❑ *K2 should finalise and test an exit management plan to assess their readiness to operate the K2 independent of the vendors by 2024. It should review its position about its capability to independently select a replacement partner after the completion of the O&M period and address any areas of dependency for ensuring its strategic position at the time of extension of O&M period during 2024.*
- ❑ *Migration of data from K1 to K2 should take place in a time bound manner, so that an integrated database can be built.*
- ❑ *Feedback and closure mechanism should be established for monitoring the timely and effective resolution of complaints received.*
- ❑ *K2 may build functionalities capable of providing trend analysis and dynamic reporting leveraging the power of historical data captured.*
- ❑ *A report for DDOs for closely monitoring the status of reprocessing of failed payments may be provided. Timelines may also be prescribed for reprocessing of the failed payment bills.*
- ❑ *The policies/guidelines are duly approved to serve as an authorised document to be used in K2 project implementation.*
- ❑ *Security audit covering all components of the K2 infrastructure may be undertaken on priority basis. Such audits should also be made applicable for new/amended functionalities to ensure that updated versions of the application are released into the production environment only after audit.*

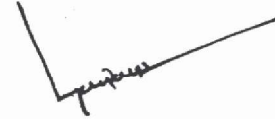
- ❑ *K2 may consider preparing strategic plan to demonstrate and document the direction of the project that evolves with changing technology landscape.*
- ❑ *K2 may establish the envisaged team of experts covering the application, database and security for gaining the intended level of control over the Application implementation.*
- ❑ *K2 may provide functionalities to monitor timely and effective use of grants by providing a functionality for monitoring the submission of utilisation certificates.*



**Bengaluru**  
**The 18 March 2022**

**(S. Shanthi Priya)**  
**Principal Accountant General (Audit-I)**  
**Karnataka**

**Countersigned**



**New Delhi**  
**The 21 March 2022**

**(Girish Chandra Murmu)**  
**Comptroller and Auditor General of India**



# Appendices



## Appendix 2.1

(Reference: Paragraph 2.5, Page 12)

### Project Milestones as per MSA

Sl. No	Milestone	Deliverable from System Integrator	Timeline specified	Percentage of Payment as per MSA	Payments made
1	Contract sign-off	Performance bank guarantee (PBG) for 10 per cent of total contract value. Detailed Project Plan for Design, Development and Implementation of K2 Solution	Contract sign-off date	NIL	The payments were not regulated in accordance with the project milestones as the project deviated from the original project schedule
2	Sign-off from Department on final Functional Requirement Specifications (FRS) and System Requirement Specifications (SRS)	Final FRS and SRS	T+11 weeks	15 per cent of software capex	
3	Sign-off from Department on System Design Document and Testing Approach, test case and test Plan documents.	Detailed solution architecture specifying the major components of the solution and their integration, Technical / System design document (SDD), User interface designs, Database structures, Security architecture and policies, Network architecture, Data backup and recovery strategy etc.	T+25 weeks	15 per cent of software capex	
4	Delivery and deployment of the required IT equipment (including hardware and networking devices) suggested as part of technical solution for Data Centre (DC) and Disaster Recovery Centre (DRC)	Deployment of IT infrastructure solution encompassing network, servers, storage, system software etc., at Data Centre.	T+36 weeks	60 per cent of the entire capex for DC and DRC	

Sl. No	Milestone	Deliverable from System Integrator	Timeline specified	Percentage of Payment as per MSA	Payments made
5	Submission of all modules of K2 software for third party acceptance testing and User Acceptance Testing (UAT)	Developed, customized, tested application software for all the services (Before submission of software for third party acceptance testing and UAT, the SI should perform in-depth internal testing and should address all the gaps identified during such internal testing). Reports on various test performed for K2 solution along with the results and resolution reports for the issues identified during testing.	T+37 weeks	15 per cent of software capex	
6	Upon successful fixing of issues highlighted in third party and UAT of all the modules of the application software.	For approval and acceptance of the application software. Fully complying application software verified by the Third Party Auditor (TPA)	T+41 weeks	20 per cent of software capex	
7	Deployment of the entire hardware and network equipment at treasuries covered under Phase-1	Deploy hardware, network and systems software equipment and perform availability, performance, reliability and security testing across all treasuries of Phase-1	T+41 weeks	45 per cent of the entire capex for District/Sub-Treasuries	
8	Deployment of the entire hardware and network equipment at treasuries covered under Phase-2	Deploy hardware, network and system software equipment and perform availability, performance, reliability and security testing across all treasuries of Phase-2	T+43	45 per cent of the entire capex for District/Sub-Treasuries	
9	Pilot Go-live of all modules of the K2 application software	Defect free K2 solution software <i>etc.</i> Completion of end user training for the select locations. SLA monitoring and measurement system using Enterprise Management System (EMS). Call Centre Operations along with the Automated solution for Call Centre operations Implementation of Communications Management Plan	T+51	15 per cent of software capex 15 per cent of the entire capex for DC and DRC	
10	Commencement of operations of the Data	Commencement of operations such that users from all treasuries are able to access all the modules of the application software.	T+58	10 per cent of the entire capex for DC and DRC	

Sl. No	Milestone	Deliverable from System Integrator	Timeline specified	Percentage of Payment as per MSA	Payments made
	Centre and DRC with all treasuries migrating to K2	This will be the culmination of both the stages of pilot and rollout.			
11	Go-live of K2 software at all other locations	Defect Free K2 Solution Software etc. Completion of end user training, SLA Monitoring and Measurement system using EMS, Call Centre Operations along with the Automated solution for Call Centre operations, Implementation of Communications Management Plan	T+70	10 per cent of software capex; 10 per cent of the entire capex for DC and DRC; 10 per cent of the entire capex for District / Sub Treasuries; Entire pre go-live operation and maintenance cost	
12	Completion of integration of all State Government departments with K2	Training of nominated officers of each department. Soft deployment of tools (if required). Commencement of the usage of the K2 application software by all departments.	122 weeks	10 per cent of software capex 5 per cent of the entire capex for DC and DRC.	
13	Quarterly Operations and Maintenance Support	Post Implementation Support to DoT Call Log and Resolution Reports for Helpdesk Daily / Weekly / fortnightly / monthly performance monitoring reports for the K2 Solution	70 weeks (O&M from date of go-live at all locations (72 months or 24 quarters))	1 / 24th part of the opex quoted excluding CCN man-month rates subject to penalties as per SLA	

## Appendix 2.2

(Reference: Paragraph 2.6.5, Page 16)

### Statement showing the computation of additional financial commitment due to non-revision of O&M Schedule

The date of commencement of the project as per MSA	<b>18 October 2011</b>
The date of completion of Development phase as per MSA	19 February 2013
The date of commencement of O&M period as per MSA	19 February 2013
The date of actual roll out of the first module after development	September 2015
The date of completion of six year period from the roll out of the first module.	September 2021
The date of renewal of the O&M contract	September 2019
The cost of the O&M contract as per the original contract	₹34.29 crore
The pro rata cost of O&M contract per year as per the original contract	₹5.71 crore
The cost of the O&M as per the revised contract for five year period	₹125.44 crore
The pro rata cost of O&M contract per year as per the original contract	₹25.08 crore
The loss of O&M period due to non-revision of time lines minimum two years even considering the date of roll of the initial modules during September 2015	Minimum 2 years
The avoidable excess financial commitment (2*₹25.08 crore = ₹50.17 crore - 2*₹5.71 crore = ₹11.42 crore)	₹38.75 crore

## Appendix 2.3

(Reference: Paragraph 2.7.1, Page 21)

### Module-wise status of sign off of SRS, SDD and review of SRS

Sl. No	Module name	SRS status/Documentation	SRS Signed Off Date	SDD status	SDD Signed-off Date	Review of SRS document by Department
1	Receipts (Ver 1.3)	Completed	15-Mar-13	Completed	July 2017	Reviewed
2	Bill Processing (Ver 1.3)	Completed	29-May-13	Completed	July 2017	Reviewed
3	SSP (Ver 1.3)	Completed	08-Jul-13	Completed	July 2017	Reviewed
4	BMS (Ver 1.3)	Completed	08-Jul-13	Completed	July 2017	Reviewed
5	Bill Preparation and Submission (Ver 1.4)	Completed	19-Aug-13	Completed	July 2017	Reviewed
6	Pension (Ver 1.4)	Completed	31-Aug-13	Completed	July 2017	Reviewed
7	NPS (Ver 1.4)	Completed	31-Aug-13	Completed	July 2017	Reviewed
8	Deposits (Ver 1.3)	Completed	05-Oct-13	Completed	July 2017	Reviewed
9	Payment Authorization (Ver 1.4)	Completed	22-Oct-13	Completed	July 2017	Not Reviewed
10	PRI Accounts (Ver 1.3)	Completed	27-Dec-13	Completed	July 2017	Reviewed
11	Budget Control (Ver 1.3)	Completed	02-Jan-14	Completed	July 2017	Reviewed
12	General Admin-Organogram (Ver 1.4)	Completed	19-Mar-14	Completed	July 2017	Not Reviewed
12a	General Admin-MDM (Ver 1.4)	Completed	19-Mar-14	Completed	July 2017	Not Reviewed
12b	General Admin-Common Functionality & Security (Ver 1.4)	Completed	29-May-14	Completed	July 2017	Not Reviewed
12c	General Admin-Workflow (Ver 1.5)	Completed	26-Aug-14	Completed	July 2017	Not Reviewed
13	Accounts Compilation (Ver 1.3)	Completed	12/12/2014, 18/02/2015, 23/02/2015, 23/04/2015, 18/2/2016	Completed	July 2017	Not Reviewed
14	HBA SRS (Ver 1.2)	Completed	06-Jun-14	Completed	July 2017	Partially Reviewed
15	Strong room and inventory Mgt. (Ver 1.2)	Completed	09-Jun-14	Completed	July 2017	Not Reviewed
16	Audit Monitoring (Ver 1.1)	Completed	09-Jun-14	Completed	July 2017	Not Reviewed
17	Document Management System (Ver 1.1)	Completed	20-Aug-14	Completed	July 2017	Not Reviewed

Sl. No	Module name	SRS status/ Documentat ion	SRS Signed Off Date	SDD status	SDD Signed-off Date	Review of SRS document by Department
18	Fiscal Management (V 1.4)	Completed	11-Nov-14	Not yet submitted	Not submitted	Not Reviewed
19	Budget Preparation (Ver 1.2)	Completed	19-Dec-14	Completed	July 2017	Not Reviewed
20	Treasury Inspection (Ver 1.1)	Completed	01-Jan-16	Completed	July 2017	Reviewed
21	Cash Management (Ver 1.4)	Completed	17-Feb-16	Completed	July 2017	Not Reviewed
22	NTT (Ver 1.1)	Completed	18-Aug-18	Not yet submitted	Not submitted	Not Reviewed
23	ALM (Ver 1.0)	Completed	18-Aug-18	Not yet submitted	Not submitted	Not Reviewed
24	Expenditure Tracking(Ver 1.1)	Completed	18-Aug-18	Completed	Oct 2019	Not Reviewed

## Appendix 2.4

(Reference: Paragraph 2.8.3, Page 27)

### Statement showing the change reasons for CCNs

CCN number	Part A – Initiation		Part B – Evaluation	
	Description of change	Change reason(s)	Brief description of solution	Impact
<b>ACC CR 18</b>	Change Request for Updating Payment status of Challans for which e-Receipt scroll is received and payment status is not received from Bank	Requirement raised by PMU.	As explained in Description of Change in Part A	As explained in Description of Change in Part A
<b>ACR 10</b>	Raising of Correction Request (CR) 1. System should not allow correction for external agency payment (voucher number) 2. Provide view voucher number/view challan hyperlink to get the details of the voucher/challan while generating CR 3. Year field modification: instead of financial year display calendar year	Requirement raised by PMU.	As explained in Description of Change in Part A	As explained in Description of Change in Part A
<b>ACR 15</b>	Work around screen for Head of Office role for reduction in lapsed balances process.	Requirement raised by PMU.	As explained in Description of Change in Part A	As explained in Description of Change in Part A
<b>BC 10</b>	SMS Functionalities: SMS notification needs to be sent to the recipient (DDO/CO/CCO/Group of DDO's) on fund released to them.	As per discussion with the PS.	As explained in Description of Change in Part A	As explained in Description of Change in Part A
<b>MDM 25</b>	Change Request to allow selection of CSO requirement based on Bill type-Claim type-threshold amount for each Budget line.	Requirement raised by PMU.	As explained in Description of Change in Part A	As explained in Description of Change in Part A
<b>REC 13</b>	Removal of DDO role validation for GST /VAT Refund Maker in GST /VAT refund order and bill generation screen.	Requirement raised by PMU.	As explained in Description of Change in Part A	As explained in Description of Change in Part A

## Appendix 3.1

(Reference : Paragraph 3.1.1, Page 32)

### Status of implementation of processes

Stage I				Stage II			
Module	Total Sub-Processes	Deployed in production	To be deployed	Module	Total Sub-Processes	Deployed in production	To be deployed
Accounts Compilation	21	8	13	Assets & Liability Management	25	0	25
BMS / DBT	22	20	2	Audit Monitoring	3	0	3
BP	94	90	4	Budget Preparation	28	0	28
BPS	284	281	3	Cash Management System	3	0	3
Budget Control	54	7	47	DMS	30	0	30
Deposits	101	12	89	Expenditure Tracking	4	0	4
MDM	68	60	8	Fiscal Management	12	0	12
NPS	38	15	23	House Building Advance (HBA)	2	0	2
Organogram	33	29	4	ISR	32	0	32
Payment Authorization	49	40	9	Non-Treasury Transactions	44	0	44
Pension	45	7	38	Treasury Inspection	8	0	8
PRI	70	43	27				
Receipt	47	43	4				
SSP	13	10	3				
<b>Grand Total</b>	<b>939</b>	<b>665</b>	<b>274</b>	<b>Grand Total</b>	<b>192</b>	<b>0</b>	<b>192</b>

## Appendix 3.2

*(Reference: Paragraph 3.1.1, Page 33)*

### Impact of non-implementation of Stage-2 modules

SI No	Name of the Module	Description
1	<b>Cash Management Module</b>	Cash management module intended to assist the complex cash management process in the Government by automating the multiple channels for revenue collections and expenditures. The Cash Management module would collect the Receipts and Payments data from different channels, daily, aggregate it and give a comprehensive picture to the finance administrators. The cash management modules was not developed and deployed as of March 2020. The Cash Management Module would support the management in day to day control over spending, fixing up priorities of payments, allowing expenditure based on objectives, finding additional sources, monitoring of revenue generation and managing cash flow to avoid over drafts. This module enables working out cash flows on day to day basis.
2	<b>Fiscal management module</b>	Khajane II was to build capability to generate multi-year reports such as medium term fiscal framework statements, reports facilitating the comparison of receipts and expenditure over multiple years, resource estimation reports, monthly programme implementation calendar (MPIC) reports. The fiscal management module was yet to be operationalized. The State Government as part of the fiscal reforms formulated the first Medium Term Fiscal Plan (MTFP) for the period 2000 to 2005 based on the broad parameters of fiscal correction laid down by the 11 <sup>th</sup> FC. The MTFP became an annual rolling document and the fiscal targets and policies set out in the MTFP were dovetailed to the annual budgetary exercise. The Karnataka Fiscal Responsibility Act (KFRA), 2002, provided statutory backing to MTFP. MTFP report were yet to be incorporated in K2.
3	<b>Non-Treasury Transactions Module</b>	Certain transactions are performed by the Government or its agencies outside the ambit of the Treasury, which pertains to the funds received directly from GoI for certain schemes. GoI transfers funds to various schemes either directly to the implementing agency or by routing through the State Consolidated Fund. For some of these schemes, the GoI share is complemented by the State share as per the scheme norms. The details of states share as well as GoI share constitute the total scheme funds. This module is meant to track such type of grants, as well as expenditure done against them, within the Khajane and

Sl No	Name of the Module	Description
		generate consolidated accounts and reports. This module is also expected to integrate with the following agencies for sharing various financial details about such schemes with them – CPSMS (Central Plan Scheme Monitoring System) – Such transactions are based on specific orders of the GoI/AG or may arise as a result of the debt service done by RBI on behalf of the State Government. K2 II should have capability to account such transactions.
4	<b>Assets and Liabilities Management Module</b>	Financial assets of the Government include equity investments and loans provided to various companies, corporations, boards and societies. The contingent assets are not a part of the finance accounts but have to be maintained as a statement supplement to the accounts. Financial liabilities of the Government include long term loans taken from various sources such as GoI, financial institutions and financial markets, short-term loans from RBI, and contingent liabilities in form of guarantees, annuity payments, advance tax receipts under litigation, <i>etc.</i> The long-term loans may be earmarked for specific items of expenditure such as loans from GoI for externally aided projects and loans from financial institutions for specific projects. These loans may be general purpose loans from the financial markets arranged by RBI to finance the State Plan. The contingent liabilities are not included in the finance accounts but have to be monitored in a statement supplement to the accounts. Timely accounting of the financial assets and liabilities, as and when they are created, recording their terms and conditions, monitoring returns on the assets, servicing of the liabilities, generating prompts in case of deviations from the prescribed norms, periodic reconciliation with concerned agencies (recipient of assets, holders of liabilities, and accounting agencies), and MIS have to be a part of this module. Each asset and liability should be uniquely identified. The system should be capable of collating assets and liabilities based on their type, recipient/holder, and period of creation.

# Appendix 3.3

(Reference: Paragraph 3.5.3, Page 41)

## Fund request from DDO to CO – Range Forest Officer Shrikant Bhoover – Login of user ID 1422288

The screenshot displays the 'Fund Request from DDO' form in the KHALANE II system. The form includes fields for Financial Year (2020-21), Directorate (KARNATAKA FOREST DEPARTMENT), Scheme HOA, and Scheme sub-type. A 'Generate Report' button is visible. Below the form is a table summarizing the request details.

Scheme	HOA	Object head name	Object head	Voled / charged	Fund Received by DDO	Actual Expenditure	Expenditure in pipeline	Expenditure on Pending Bill	Total	B/E with DDO	Scheme Type	Schemes Sub Type
AFFORESTATION ON FOREST AND NON FOREST AREAS	4409*01*101*0*03	Misja Works	L39	Voled	683.76.00	0	590251.00	41,94,972.00	281,13,620.00	-272,59,861.00	NA	NA

Fund request from DDO to CO – Prashant Samuel Sarvand – Login of user ID 2340469

Khajane II - Mozilla Firefox  
 https://10.25.1.55:8443/KHAJANE/fms.htm?actionFlag=loadReportParamaters&elementId=10505001&fundRequesFlag=2  
 Mr. PRASHANT SAMUEL SARVAND - Change Password  
 Post Role Switch  
 Logout  
 Help  
 ಸರ್ಕಾರದ ಸಂಸ್ಥೆಗಳಿಗೆ ಸಂಬಂಧಿಸಿದ ವಿಷಯಗಳಿಗೆ ಸಂಬಂಧಿಸಿದ ವಿಷಯಗಳಿಗೆ

Steps Recorder - Recording Now  
 Stop Record  
 Add Comment  
 Payuse Record

**KHAJANE II**  
 Karnataka Financial Management System  
 Finance Department, Government of Karnataka

Search

- BMS (Beneficiary Management System)
- Bill Preparation and Submission
- Budget Control
- Deposits
- New Pension Scheme
- PRI
- Pension
- Receipts
- Workflow

Scheme and budget line-wise fund release and expenditure at DDO

Financial year: 2020-21  
 Directorate: DEPARTMENT OF PUBLIC INSTRU  
 Scheme HOA: ಸ್ಕೀಂ ಆರ್.ಎಚ್.ಎಸ್  
 Scheme subtype: ಸ್ಕೀಂ ಉಪ ವಿಧ

Department name: PRIMARY & SECONDARY EDUCA  
 Scheme type: Select ಆಯ್ಕೆ  
 Scheme name: ಸ್ಕೀಂ ಹೆಸರು

Generate Report  
 Reset

Scheme	HOA	Object head	Object head name	Voted / charged	Fund Received by DDO	Budget distribution to DDO	Actual Expenditure	Expenditure in pipeline	Expenditure on Pending Bill	Total	BAE with DDO
REIMBURSEMENT OF FEES TO PRIVATE SCHOOLS UNDER RTE	2202*01~102*0*05	059	Other Expenses	Voted	43641307.00	0	1230376061.00	147267829.00	22428340.00	1400072230.00	-1185734754.00

Copyright 2014. All rights reserved.  
 Fields marked with \* are mandatory. | All amounts are in INR. | All the dates are in DD/MM/YYYY format. | Build Version:4.36.2

Type here to search

ENG 10:26  
 INTL 27-09-2020

## Fund request from DDO to CO – Prashant Samuel Sarvand – Login of user ID 2340469

DEPARTMENT OF PUBLIC INSTRU

Scheme type  
ಆಯ್ಕೆ ಮಾಡಿ

Scheme name  
ಆಯ್ಕೆ ಮಾಡಿ

PRIMARY & SECONDARY EDUICA

Scheme type  
ಆಯ್ಕೆ ಮಾಡಿ

Scheme name  
ಆಯ್ಕೆ ಮಾಡಿ

Generate Report    Reset

Scheme	HoA	Object head name	Object head	Voted / charged	Fund Received by DDO	Budget distribution to DDO	Actual Expenditure	Expenditure in pipeline	Expenditure on Pending Bill	Total	BAE with DDO
REIMBURSEMENT OF FEES TO PRIVATE SCHOOLS UNDER RTE	2202*01**102*0*05	Other Expenses	059	Voted	43641307.00	0	1230376061.00	147267829.00	224288340.00	1400072230.00	1186734754.00
REIMBURSEMENT OF FEES TO PRIVATE SCHOOLS UNDER RTE	2202*01**102*0*05	Special Component Plan	422	Voted	28634701.00	0	824687807.00	29222162.00	15444659.00	869364628.00	796153106.00
REIMBURSEMENT OF FEES TO	2202*01**102*0*05	Tribal Sub	423	Voted	11745683.00	0	293709174.00	54743297.00	0.00	348452411.00	281569691.00

Copyright 2014. All rights reserved. Fields marked with \* are mandatory. All amounts are in INR. | All the dates are in DD/MM/YYYY format. | Build Version:4.36.2

Khajane II - Mozilla Firefox

Steps Recorder - Recording Now

Post:Role Switch

Change Password

Help

Logout

Mr- PRASHANT SAMUEL SARVAND

2020-21

DEPARTMENT OF PUBLIC INSTRU

Department name  
ಇಲಾಖಾ ಹೆಸರು

PRIMARY & SECONDARY EDUCA

Scheme type  
ಸ್ಕೀಂ ವಿಧ

Select ಆಯ್ಕೆ

Scheme name  
ಸ್ಕೀಂ ಹೆಸರು

Financial year  
ಆರ್ಥಿಕ ವರ್ಷ

2020-21

Directorate  
ನಿರ್ದೇಶನಾಲಯ

DEPARTMENT OF PUBLIC INSTRU

Scheme HOA  
ಸ್ಕೀಂ ಹೆಚ್.ಆರ್.ಎಸ್.

Scheme sub type  
ಸ್ಕೀಂ ಉಪ ವಿಧ

Select ಆಯ್ಕೆ

Generate Report

Reset

Scheme and budget line-wise fund release and expenditure at DDO

Scheme	HoA	Object head name	Object head	Voted / charged	Fund Received by DDO	Budget distribution to DDO	Actual Expenditure	Expenditure in pipeline	Expenditure on Pending Bill	Total	BAE with DDO
REIMBURSEMENT OF FEES TO PRIVATE SCHOOLS UNDER RTE	2202*01*102*0*05	Other Expenses	059	Voted	43641307.00	0	1230376061.00	147267829.00	22428340.00	1400072230.00	-1186734754.00

Copyright 2014. All rights reserved.

Fields marked with \* are mandatory. | All amounts are in INR. | All the dates are in DD/MM/YYYY format. | BuildVersion:4.36.2

Type here to search

ENG 10:26

INTL 27-09-2020

## Appendix 3.4

(Reference: Paragraph 3.5.5, Page 42)

### Details of issues noticed and corrective measures taken up

Sl. no.	Gist of audit findings	Reply of the Department	Audit remarks
1	<p>During 2018-19, the application showed 12 departments as having received `62.22 crore in excess of the budget allotment.</p> <p>During 2017-18 to 2019-20, DDOs received funds of `123.48 crore in excess of budget allotment under 10 budget items.</p>	<p>The Budget control module was active both in K1 and K2. The extent of budget released to K1 is treated as complete expenditure in K2. The actual expenditure includes expenditure incurred in K1 plus funds transferred to K1. This has resulted in exhibiting fund master expenditure in excess the bill expenditure. This is an error of computation of budget received by Administrative department.</p> <p>The excess funds received by DDOs is due to double click issue where the funds released once were updated twice due to double click.</p> <p>Both the problems are fixed by the Technical team.</p>	<p>These issues highlight the need for strengthening the user acceptance testing covering the important scenarios, examining the testing controls in place within the SI development team to provide assurance about the implementation of adequate validation controls, need for a proper third-party auditing and certification.</p>
2	<p>Five DDOs incurred excess expenditure than the funds released by FD to an extent of `6.63 crore under seven budget items</p>	<p>The defects mentioned are immediately acted upon in production so as not to cause any further repercussion. A trigger has been added in IFMS fund master table on 4 April 2020 for not exceeding fund received by the stakeholder against budget allocation for a particular budget item.</p>	

## Appendix 3.5

(Reference: Paragraph 3.6, Page 42)

### Statement showing the types of bills

Sl. No.	CTS Form No.	Form Number	Bill Type
1	CTS 1	KFC 24	Gazetted/ Non-Gazetted Establishment Pay Bill
2	CTS 2	KFC 29	Gazetted/ Non-Gazetted Establishment TA Bill
3	CTS 5	MCE 4	Detailed Contingent (DC) Bill
4	CTS 6	MCE 2	Abstract Contingency (AC) Bill
5	CTS 7	GPF form 5	General Provident Fund (GPF) Bill
6	CTS 8		Payees Receipt
7	CTS 9		Miscellaneous bill
8	CTS 10	KFC 31	Refund of Revenue Bill
9	CTS 12	MCE 3	N.D.C Bill
10	CTS 13	KFC 3	Grant in Aid (GIA) Bill

## Appendix 3.6

*(Reference: Paragraph 3.6.9, Page 51)*

**Statement showing the total number of claims processed choosing DC bill claim type**

Year	No. of Bills	Payment Amount
2015	961	15,37,35,384
2016	46,650	8,00,18,78,782
2017	88,220	80,33,81,85,637
2018	1,34,059	1,15,62,11,70,754
2019	1,01,383	1,02,66,56,62,002
<b>Total</b>	<b>3,71,273</b>	<b>3,06,78,06,32,559</b>

## Appendix 3.7

*(Reference: Paragraph 3.6.10, Page 51)*

**Junk data in Sanction order field**

Sanction order Number	No .of times used	Sanction order Number	No .of times used
SO000001	700068	18	2644
ACT-4	2392	17	2434
9	2481	16	3051
8	3017	15	3709
7	2967	14	3082
6	3776	13	3502
5	4203	12	5226
4	4678	11	4445
3	6066	10	5613
26	2395	1	57981
25	2756	09	2334
23	2303	08	2585
22	2370	07	2830
21	2305	06	3479
2020-21	2880	05	4469
2019-20	20117	04	5038
2018-19	10666	03	6124
2017-18	6746	02	9027
20	2447	01	43754
2	8821	0	3473
19	2376	/2019-20	2818
/2018-19	2734		

## Appendix 3.8

(Reference: Paragraph 3.9.1, Page 57)

### Statement showing the details of bills for which expenditure was not booked

Sl. No	Bl_id	Bl_no	Token_no	Ddo_id	Ddo_code	Gross_amt	Net_amt	Voucher_no	Voucher_date
1.	1309159458	AD1610191287	1600185334	3203	209530	121000	108500	2014557A0117000099	09-01-2017 13:56
2.	1382219734	AD1701004398	1700004160	1229	104530	54979	37055	2040568A0417000345	17-04-2017 12:31
3.	1382219794	AD1701002942	1700002735	8427	180390	743152	583754	2202583E0417000806	10-04-2017 12:09
4.	1382219934	AD1701002951	1700002723	1298937837	19552D	91045	73707	2204572E0417000028	07-04-2017 12:05
5.	1382220125	AD1701004183	1700003976	1265546982	11516D	729805	482961	2055566A0417000348	06-04-2017 16:50
6.	1382221945	AD1701002910	1700002703	6072	186370	73160	54706	2425556G0417000112	11-04-2017 12:00
7.	1382222091	AD1701003099	1700002874	1244995500	11445D	665710	450889	2055577A0417000106	05-04-2017 17:44
8.	1382222144	AD1701002917	1700002709	1211452064	16470D	472985	378908	2217572E0417000005	07-04-2017 17:29
9.	1382222760	AD1701002978	1700002810	1253650191	11514D	990071	621601	2055573A0417001100	10-04-2017 17:28
10.	1412259022	AD1708271749	1700256706	21	101040	525	525	2235562A1117002734	30-11-2017 10:42
11.	1413194679	AD1810579032	1800553608	9741	224920	10000	9000	2401575B0219000426	01-02-2019 15:24
12.	1413343121	AD1811726284	1800691379	2822	202710	5800	5800	2230562E0219002062	17-02-2019 13:26
13.	1413363359	AD1811746345	1800716509	1884	206680	810	810	2014572E0219004935	20-02-2019 15:12
14.	1413363373	AD1811746359	1800711404	8909	225520	900000	900000	2404563D0319000493	11-03-2019 17:02
15.	1413383265	AD1811766140	1800730432	21740	346050	29437	29437	2230572B0319000378	06-03-2019 18:09
16.	1413403955	AD1811786678	1800752467	6384	146940	3846	3846	2401558A0219027141	23-02-2019 10:37
Total						4892325			

## Appendix 3.9

(Reference: Paragraph 3.10.10, Page 68)

### Inconsistencies in reference to fields

No consistency in field referencing / matching

View Name	View Definition
<p><b>PA_BL_HDR_EPYMNT_VW</b></p> <div style="border: 1px solid black; border-radius: 15px; padding: 10px; width: fit-content; margin: 10px auto;"> <p>“_syscode” fields and “_ID” fields can be used interchangeably?</p> </div>	<pre>CREATE OR REPLACE VIEW PA_BL_HDR_EPYMNT_VW AS SELECT blRcpnt.BL_RCPNT_ID, blHdr.TOKEN_NO, paymentDtl.PAYMENT_ID, paymentDtl.RCPNT_ID, paymentDtl.PMNT_AMT FROM BL_HEADER_TXN blHdr,PA_PAYMENT_DTL_TXN paymentDtl,BL_RCPNT_TXN blRcpnt where blHdr.BL_ID=paymentDtl.PAYMENT_SRC_ID and blHdr.BL_ID=blRcpnt.BL_ID and blRcpnt.ACTIVE_FLAG=10000901 and blRcpnt.RCPNT_SYSCD=paymentDtl.RCPNT_ID</pre>
View Name	View Definition
<p><b>IFMS_TREASURY_MST_VW</b></p> <div style="border: 1px solid black; border-radius: 15px; padding: 10px; width: fit-content; margin: 10px auto;"> <p>“_syscode” fields and “_ID” fields can be used interchangeably?</p> </div>	<pre>CREATE or replace VIEW KIFMS.IFMS_TREASURY_MST_VW AS SELECT dtl.*, tl.TREASURY_NAME, tl.LANG_ID, contatc.FAX, contatc.EMAIL, contatc.OFFICE_PHONE, locDtl.GEO_LOC_ID as district_id, locDtl.GEO_LOC_NAME as district_name, orgMst.ORG_ID as ORG_ID, orgMst.PRNT_ORG_ID as PRNT_ORG_ID, orgMst.ORG_TYPE as ORG_TYPE, orgDtl.ORG_NAME as ORG_NAME, orgDtl.ORG_SHRT_NAME as ORG_SHRT_NAME, orgDtl.ORG_DESCRIPTION as ORG_DESCRIPTION FROM IFMS_TREASURY_DTL dtl join IFMS_TREASURY_DTL_TL tl on dtl.TREASURY_DTL_ID=tl.TREASURY_DTL_ID join ORG_OFFICE_MST as officeMst on officeMst.OFFICE_ID = dtl.OFFICE_SYSCD join CMN_ADDRESS_FIELD_MPG as addMpg on addMpg.ADDRESS_ID = officeMst.OFFICE_ADD_ID join (CMN_GEOGRAPHIC_LOC_MST as locMst join CMN_GEOGRAPHIC_LOC_DTL as locDtl on locMst.GEO_LOC_ID = locDtl.GEO_LOC_ID and locMst.GEO_LOC_TYPE = 1000150166 ) on addMpg.NUMBER_VALUE = locMst.GEO_LOC_ID and tl.LANG_ID = locDtl.LANG_ID and tl.LANG_ID =addMpg.LANG_ID join ORG_OFFICE_MPG orgm on orgm.OFFICE_ID = officeMst.OFFICE_ID join (ORG_ORGANIZATION_MST as orgMst join ORG_ORGANIZATION_DTLS as orgDtl</pre>

View Name	View Definition
	<pre> on orgMst.ORG_ID = orgDtl.ORG_ID ) on orgMst.ORG_ID = orgm.ORG_ID and tl.LANG_ID = orgDtl.LANG_ID left outer join CMN_CONTACT_MST contac on contac.SR_NO=dtl.CONTACT_ID and tl.LANG_ID = contac.LANG_ID </pre>

View Name	View Definition
<b>BDC_AIE_DEMAND_VW</b>	<pre> CREATE OR REPLACE VIEW BDC_AIE_DEMAND_VW AS SELECT demandmst.DEMAND_CODE , demandTl.DESCRPTION , . . fundmst.FINYEAR_ID as FUND_YEAR FROM IFMS_DEMAND_MST demandmst join IFMS_DEMAND_DTL demandDtl on demandMst.DEMAND_MST_ID=demandDtl.DEMAND_SYSCD and demandMst.ACTIVE_STATUS=10000901 and demandMst.WF_STATUS=10000803 join IFMS_DEMAND_MST_TL demandTl on demandMst.DEMAND_MST_ID=demandTl.DEMAND_MST_ID and demandTl.LANG_ID=1 join IFMS_SCHEME_PRPTY_MST schemePrpty on schemePrpty.ADMIN_DEPT_CODE= demandDtl.AD_SYSCD and schemePrpty.DIRECTORATE_CODE= demandDtl.DIR_SYSCD and schemePrpty.ACTIVATE_FLAG = 10000901 join IFMS_COA_LINE_ITEM_MST schememst onschemePrpty.COA_LINE_ITEM_ID=schememst. COA_LINE_ITEM_SYSCODE and schememst.ACTIVE_FLAG=10000901 and schememst.REQUEST_STATUS=10000803 and schememst.LATEST_RECORD=1 join IFMS_COA_LINE_ITEM_MST blmst on blmst.COL30_SYSCODE=schememst.COA_ LINE_ITEM_SYSCODE ..... join IFMS_BL_FUND_MST fundmst on fundmst.BUDGET_LINE_SYSCODE=blmst. COA_LINE_ITEM_SYSCODE ..... demandMst.EFFECTIVE_YEAR, fundmst.FINYEAR_ID </pre>

Pointers to the same field "Demand\_mst\_id" in parent table are named differently in two child tables

Identical field name exists in schememst-coa\_line\_item\_id which will also match part of the records! \*\*

\*\* similar and competing fields IFMS\_COA\_LINE\_ITEM\_MST Table with potential for wrong results

select count(distinct coa\_line\_item\_id) from IFMS\_COA\_LINE\_ITEM\_MST a

where a.ACTIVE\_FLAG=10000901 ; -- 35094 distinct values  
select count(distinct coa\_line\_item\_syscode) from IFMS\_COA\_LINE\_ITEM\_MST a  
where a.ACTIVE\_FLAG=10000901; --35094 distinct values  
select count(\*) from  
(select coa\_line\_item\_id from IFMS\_COA\_LINE\_ITEM\_MST a where  
a.ACTIVE\_FLAG=10000901  
intersect select coa\_line\_item\_syscode from IFMS\_COA\_LINE\_ITEM\_MST a where  
a.ACTIVE\_FLAG=10000901 ) ; -- 22193 is the result. There are 22193 values which are  
common to coa\_line\_item\_id and coa\_line\_item\_syscode

*This means that coa\_line\_item\_id as well as coa\_line\_item\_syscode both are of same datatype (bigint) and have a valid subset of common values as well as values in one which are not found in the other). So, both can be used in join conditions with differing results and partly matching results! The error in the query wording will not be obvious from the result.*

### Same Field Name Different Data Types

Attribute	Name	Alpha Numeric	Numerical			
		VARCHAR	BIGINT	DECIMAL	INTEGER	SMALLINT
<b>DDO identifier</b>	DDO_CODE	65	6			
	DDO_ID		84			
	DDO_SYSCD		109			
	DDO_SYSCODE		18			
<b>Employee identifier</b>	EMP_CODE		6	1		
	EMP_ID	3	13	3		
<b>OFFICE identifier</b>	OFFICE_CODE	1	6			
	OFFICE_ID	1	17			
<b>POST identifier</b>	POST_CODE	7	28			
	POST_ID	9	31	3		
<b>ROLE identifier</b>	ROLE_CODE		7			2
	ROLE_ID	4	25	10		
<b>TREASURY identifier</b>	TREAS_ID		20			
	TREAS_SYSCD		23			
	TREASURY_CODE	46	58		1	2
	TREASURY_SYSCODE	1	17			
	TRSRY_CODE	2	5			
<b>Other</b>	CSO_POST_CODE		3			
<b>Other</b>	USER_ID	6	36	3		

## Appendix 3.10

(Reference: Paragraph 3.11.7, Page 73)

### MIS Reports

Level	Role	Reports	Observations		
FD level	Budget-FD- A	BDC009 Fund release and expenditure report at FD(AD)	All administrative departments cannot be selected at once		
			All directorates in a single administrative department cannot be selected at once		
			Individual budget lines cannot be selected (all is default option)		
			Report showing null values		
	Budget- AD-A	BDC 032 Demand-wise Expenditure Report	Total of a Demand is not available in the report.		
			BDC021-order details at AD	All Directorates cannot be selected at once Total per Order is not available. Cannot select a particular budget line so that All fund release orders related to particular Budget line cannot be fetched	
		BDC017-Fund Release and Expenditure at AD	All Directorates cannot be selected at once Cannot select a particular budget line.		
			BDC018-Fund Release and Expenditure at AD (CCO level)	Cannot select a particular budget line. Multiple CCOs cannot be selected	
		BDC019-Fund Release and Expenditure at AD (CO level)	Cannot select a particular budget line. Multiple COs cannot be selected		
			BDC020-Fund Release and Expenditure report at AD(DDO)	Multiple DDOs cannot be selected Cannot select a particular budget line.	
		CCO level		Chief Controlling Officer	MIS038 – DDO-wise Budget-line-wise Budget and Expenditure for CCO
			BDC016-Amount Redistributed at CCO		Not working (Selection of Admin Department and/or Directorates are not working)
	BDC003-CCO Fund Release and				
	DDO Fund Release and expenditure report				
BDC006 – CO Fund Release report	Not working (Selection of Admin Department and/or Directorates are not working)				

Level	Role	Reports	Observations
		DDO Fund Release and Expenditure Report	Not working (Selection of Admin Department and/or Directorates are not working)
		BDC001- Order Details	Not working (Selection of Admin Department and/or Directorates are not working)
<b>CO Level</b>	Controlling Officer	BDC002- Order details for fund release by CO to DDO	Not working (Selection of Admin Department and/or Directorates are not working)
		BDC004-CO Fund Release	Report showing nil value
		BDC008-DDO Fund Release Expenditure report for CO	Report showing nil values

## Appendix 3.11

(Reference: Paragraph 3.12, Page 74)

### Statement showing the number for bills with status description

Bill status Description - DDO	Financial Year						Grand Total
	Number of Bills						
Bill status description - Treasury	2014	2015	2016	2017	2018	2019	
No status				2		8	10
Accounting Reconciliation done		1391	6328	6713	11293	43545	69270
Accounting Reconciliation done.		1391	6328	6713	11293	43545	69270
Bill and documents printed by caseworker		1			39	154	194
Bill and documents printed by caseworker		1			39	154	194
Bill Approved, pending Payment Processing	60	10148	370993	530136	986226	1972277	3869840
Bill accepted by Bill separation PPU		24	51	371	319	86	851
Bill accepted by the PPU-PM						1	1
Bill accepted by TO						3	3
Bill approved by TO		70	293	1872	6486	1165	9886
Bill awaiting acceptance by SPU		105	32294	26385	109603	127412	295799
Bill awaiting acceptance by Account user	54	849	75436	139173	335455	387334	938301
Bill awaiting acceptance by the PPU-PM						2	2
Bill Objected by PPU PM						1	1
Bill objected by TO				1			1
Bill verified by PPU_PM and awaiting acceptance by HA						1	1
Top sheet generated and Bill awaiting acceptance by SPU		5218	95223	88761	131117	579544	899863
Top sheet generated and Bill Sent to account section	6	3882	167696	273573	403246	876728	1725131
Bill Cancelled in Treasury		60	1234	1038	1574	2244	6150
Bill Cancelled, awaiting acceptance by FOA		1			7	2	10
Bill Cancelled, pending delivery to the DDO					6	46	52
Cancelled bill added to Treasury Records		23	53	9	7	22	114
Cancelled bill delivered to the DDO		36	1181	1029	1554	2174	5974
Bill Created and present with Case worker		2			29	59	90
Bill Created and present with Case worker		2			29	59	90
Bill Objected in Treasury		1		1	49	32	83
Bill Objected, awaiting acceptance by FOA		1		1		1	3
Objected bill delivered to the DDO					49	31	80
Bill placed on Hold					4		4
Bill release in progress					4		4
Bill rejected by DDO		560	19967	41566	91002	123506	276601
Bill rejected by DDO		560	19967	41566	91002	123506	276601

Bill status Description - DDO	Financial Year						Grand Total
	Number of Bills						
Bill status description - Treasury	2014	2015	2016	2017	2018	2019	
Bill rejected by the system due to financial year end	15	883	13865	14996	28988	79243	137990
Bill rejected by the system due to financial year end	15	883	13865	14996	28988	79243	137990
Bill Rejected in Treasury		198	5799	8587	19887	39850	74321
Bill Rejected, awaiting acceptance by FOA				1			1
Rejected bill added to Treasury Records						21	21
Rejected bill delivered to the DDO		198	5799	8586	19887	39829	74299
Bill with Case Worker for verification		7			70	94	171
Bill with Case Worker for verification		7			70	94	171
Bill with DDO					30	31	61
Bill with DDO					30	31	61
Bill with Superintendent for verification					66	71	137
Bill with Superintendent for verification					66	71	137
Documents awaiting printing by caseworker					72	109	181
Documents awaiting printing by caseworker					72	109	181
Draft Bill Request received					1	14	15
Draft Bill Request received					1	14	15
Draft Bill Request rejected		529	3976	1487	1732	21986	29710
Draft Bill Request rejected		529	3976	1487	1732	21986	29710
Online bill submitted to the Treasury pending physical copy submission		5			583	1224	1812
Online bill submitted by the DDO but Physical copy submission pending		5			583	1224	1812
<b>Grand Total</b>	<b>75</b>	<b>13785</b>	<b>422162</b>	<b>604526</b>	<b>1141645</b>	<b>2284447</b>	<b>4466640</b>

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## Appendix 3.12

(Reference: Paragraph 3.14, Page 79)

### Statement showing the reprocessing of failed payments

YEAR	No. of payments failed	Amount	No. of failed payments reprocessed and passed	Amount reprocessed	No. of failed payments not reprocessed	Amount not reprocessed
2014-15						
2015-16	434	22,035,954	418	21,348,565	16	687,389
2016-17	14,015	1,585,235,760	12,473	1,553,877,911	1,542	31,357,849
2017-18	20,970	3,187,473,391	17,387	3,106,585,303	3,583	80,888,088
2018-19	57,064	4,269,564,894	45,982	4,114,464,429	11,082	155,100,465
2019-20	1,20,211	6,820,711,998	89,668	6,323,032,385	30,543	497,679,613
2020-21 (Up to August 2020)	41,868	1,171,562,853	25,395	774,071,538	16,473	397,491,315
<b>Total</b>	<b>2,54,562</b>	<b>17056584850</b>	<b>1,91,323</b>	<b>15893380131</b>	<b>63,239</b>	<b>1,16,32,04,719</b>

## Appendix 3.13

(Reference: Paragraph 3.14, Page 80)

### Statement showing the multiple repayments of failed payments

Sl No	Failed Payment ID	Total New Bills	Total Amount	Excess Bills	Excess Amount
1	E572E290616022634	3	74,817	2	49,878
2	E555A060516000608	2	23,218	1	11,609
3	E557A280117000069	2	58,604	1	29,302
4	E558A120316000012	2	30,854	1	15,427
5	E558A160217000627	2	19,500	1	9,750
6	E572E120516007587	2	41,254	1	20,627
7	E572E120516007990	2	34,454	1	17,227
8	E572E240317000989	2	1,13,470	1	56,735
9	E572E250716047878	2	72,732	1	36,366
10	E572E300616022712	2	23,240	1	11,620
11	E572E300616022721	2	20,040	1	10,020
12	E573G120216000002	2	1,620	1	810
13	E573G120216000026	2	25,320	1	12,660
14	E573G120216000033	2	25,320	1	12,660
15	E574C220716000160	2	88,282	1	44,141
16	E575A080716012165	2	17,944	1	8,972
17	E575A230716013241	2	12,398	1	6,199
18	E577C050316000010	2	65,014	1	32,507
19	E582C160117000002	2	12,034	1	6,017
20	E584A140616002497	2	26,014	1	13,007
<b>Total Excess Amount</b>					<b>4,05,534</b>