DAI

Fiscal and Accounting System of Tunisia (FAST)

Request For Proposals (RFP)

No. (RFP-REQ-TUN-23-0065)

Development of Debt Management Decision Support System – Phase 2
Issue Date: (September 15, 2023)

WARNING: Prospective Offerors who have received this document from a source other than the (FAST project, office location and ProcurementFast@dai.com), should immediately contact ProcurementFast@dai.com and provide their name and mailing address in order that amendments to the RFP or other communications can be sent directly to them. Any prospective Offeror who fails to register their interest assumes complete responsibility in the event that they do not receive communications prior to the closing date. Any amendments to this solicitation will be issued and posted.

DAI conducts business under the strictest ethical standards to assure fairness in competition, reasonable prices and successful performance or delivery of quality goods and equipment. DAI does not tolerate corruption, bribery, collusion or conflicts of interest. Any requests for payment or favors by DAI employees should be reported as soon as possible to ethics@dai.com or by visiting www.dai.ethicspoint.com. Further, any attempts by an offeror or subcontractor to offer inducements to a DAI employee to influence a decision will not be tolerated and will be grounds for disqualification, termination and possible debarment. See provision No. 9 for more details.

1. Table of Contents

Synopsis of the RFP

RFP No.	RFP-REQ-TUN-23-0065
Issue Date	September 15, 2023
Title	Development of Debt Management Decision Support System – Phase 2
Issuing Office & Email/Physical Address for Submission of Proposals	mailto:FASTprocurementinbox@dai.com DAI/FAST Project, Building Palmier du lac, 6th Floor; Feuille d'érable Avenue, Lac 2 FASTprocurementinbox@dai.com
Deadline for Receipt of Questions	~~September 21, 2023 at 5pm (Tunis Time)~~
Deadline for Receipt of Proposals	~~October 5, 2023 at 2pm (Tunis Time)~~ October 15, 2023 at 2pm (Tunis Time)
Point of Contact	For Questions and clarifications: ProcurementFast@dai.com For Proposal submission: FASTprocurementinbox@dai.com
Anticipated Award Type	Firm Fixed Price Subcontract
Basis for Award	An award will be made based on the Trade Off Method. The award will be issued to the responsible and reasonable offeror who provides the best value to DAI and its client using a combination of technical and cost/price factors.

Interested Offerors may obtain a full copy of the RFP which contains detailed instructions for preparation of the proposal. The RFP may be collected from the address and/or contact person above.

ACRONYMS AND ABBREVIATIONS

ADEB	Information System for Budget Execution Support
AMED	Information System for Budget Preparation Assistance
AO	Call for tenders
APR	Assembly of People's Representatives
CBT	Central Bank of Tunisia
WB	World Bank
MTFF	Medium-Term fiscal Framework
PA	Post- Audit
LAC	Local Authorities Code
LA	Local Authorities
PAC	Public Accounting Code
MTEF	Medium-Term Expenditure Framework
CGCDP	General Committee for the Control of Public Expenditure
CGABE	General Committee for the Administration of the State Budget
CGSP	General Committee on Public Services
CGDEAF	General Control of State and Land Affairs
CGF	General Control of Finances
CGSP	General Committee on Public Services
CHD	Hierarchical Expenditure Control
CIM	Interdepartmental Committee
CIMF	Computer Center of the Ministry of Finance
CNAPP	National Committee for Approval of Public Projects
CNI	National Computer Center
CNNCP	National Public Accounts Standards Council
COPIL	Steering Committee
COTS	Commercial Off the Shelf Software (Software Package)
PA	Payment credit
CC	Commitment credit
CCE	State Control Committee
DAF	Directorate of Financial Affairs
DAI	Global American development company
DDI	Request for Information (Demande d'information)
DGAFF	General Directorate of Tax and Financial Benefits
DGASGP	Directorate-General for Audit and Monitoring Of Major Projects
DGCPR	Directorate-General for Public Accounts and Collections
DGD	General Directorate of Customs
DGELF	Directorate-General for Tax Studies and Legislation
DGGDCF	Directorate-General for Public Debt and Financial Cooperation
DGI	Directorate-General for Taxation
DGP	Directorate-General for Contributions
DGPPP	Directorate-General for Public-Private Partnerships
DGRE	Directorate-General for Resources and Balances
DOP	Operational Breakdown of Programs
PAI	Public Administrative Institutions
EP	Public Company
EPNA	Public Non-administrative Institution
ERP	Enterprise Resource Planning
FAST	Fiscal and Accounting System of Tunisia
GAR	Results-Based Management

GBO	Budget Management by Objectives
PFM	Public Financial Management
GFS	International standards for economic classification of expenditures
WG	Working Groups
HCCAF	High Committee on Administrative and Financial Oversight
INJAZ	Integrated Project Selection and Monitoring System
INSAF	Computerization of the Administrative and Financial System of State Personnel
INS	National statistical institute
IPSAS	International Public Sector Accounting Standards
JORT	Official Gazette of the Tunisian Republic
JPD	First-Dinar Justification
ABL	Amending Budget Law
BL	Budget Law
OBL	Organic Budget Law
SL	Settlement Law
MEP	Ministry of Economy and planning
MoF	Ministry of Finance
MT	Medium term
PAD	Annual Expenditure Planning
APP	Annual Performance Project
PEFA	Public Expenditure and Financial Accountability
AGT-AL	Local Application Used by the AGT
GDP	Gross Domestic Product
PLF	Draft Budget Law
RAFIC	Information System for Streamlining Tax and Accounting Action
APR	Annual Performance Report
PM	Program Manager
RFI	Request for Information
RFFM	Responsible for the financial function at the Ministry
RFRH,	Responsible for the human resources function
RFP	Request for Proposal (specifications)
SPM	Subprogram Manager
SADEC	Information System for Decision Support and Tax Control
SIADE	Information System for the Administration of Foreign Debt
SINDA	Automated Customs Information System
TGT System	Internal Information System of the General Treasury in Tunisia
PMIS/SISP	Performance monitoring information system
TOR	Terms of Reference
TOFE/GFTOT	Table of Financial Operations of the State /Government Financial Operations Table
IS	Information system
UGBOC	Central Budget Management by Objectives Unit
OU	Operational Unit
USAID	U.S. Agency for International Development

2. Introduction and Purpose

2.1 Purpose

DAI, the implementer of the "USAID-funded Fiscal and Accounting System of Tunisia (FAST) project"), invites qualified offerors to submit proposals to supply and deliver Development of Debt Management Decision Support System – Phase 2 in support of program implementation.

Public debt management is an essential component of Tunisia's economic and financial stability. In an ever-changing world, the need to make informed and strategic decisions concerning public debt has become more crucial than ever. In response to this demand, FAST launched a project to develop a decision-making platform for public debt management with the aim of providing government decision-makers with a powerful and effective tool to assess, anticipate, and manage public debt accurately and efficiently. The first phase of this development was completed by the end of December 2022. This RFP represents the second phase which will continue the development of the Debt Management DSS.

During phase 1, FAST laid the technological and conceptual foundations for the debt management DSS by enabling decision-makers and analysts to begin exploring financial data, visualize the first indicators, and familiarize themselves with the platform's interface.

The main objective of phase 2 is to enhance and extend the functionalities of the DSS platform for the strategic management of public debt, capitalizing on the solid foundation established during phase 1 of the project. This phase aims to provide decision-makers with more powerful, sophisticated and comprehensive tools for assessing, anticipating and managing the complex and varied aspects of public debt. The objectives of this study include:

>   1.Expansion of Functional Dashboards
>
>   2.Enhanced Dimensions and Indicators

In short, phase 2 will build on the foundations laid in phase 1, taking the Public Debt Management Decision-Making Platform to the next level.

Additionally, the subcontractor is expected to provide analysis, advice, facilitation, documentation, and monitoring of activities related to this tender in order to support the MoF in achieving the desired objectives.

For a comprehensive understanding of the project's requirements, please refer to Annex A, which contains the entire statement of work attached to this RFP.

2.2 Issuing Office

The Issuing Office and Contact Person noted in the above synopsis is the sole point of contact at DAI for purposes of this RFP. Any prospective offeror who fails to register their interest with this office assumes complete responsibility in the event that they do not receive direct communications (amendments, answers to questions, etc.) prior to the closing date.

2.3 Type of Award Anticipated

DAI anticipates awarding a Firm Fixed Price Subcontract. This subcontract type is subject to change during the course of negotiations.

A Firm Fixed Price Subcontract is: An award for a total firm fixed price, for values more than $150,000, for the provision of specific services, goods, or deliverables and is not adjusted if the actual costs are higher or lower than the fixed price amount. Offerors are expected to include all costs, direct and indirect, into their total proposed price.

3. General Instructions to Offerors

3.1 General Instructions

"Offeror", "Subcontractor", and/or "Bidder" means a firm proposing the work under this RFP. "Offer" and/or "Proposal" means the package of documents the firm submits to propose the work.

Offerors wishing to respond to this RFP must submit proposals, in English, in accordance with the following instructions. Offerors are required to review all instructions and specifications contained in this RFP. Failure to do so will be at the Offeror's risk. If the solicitation is amended, then all terms and conditions not modified in the amendment shall remain unchanged.

Issuance of this RFP in no way obligates DAI to award a subcontract or purchase order. Offerors will not be reimbursed for any costs associated with the preparation or submission of their proposal. DAI shall in no case be responsible or liable for these costs.

Proposals are due no later than October 15, 2023 ~~October 5, 2023~~ at 2pm (Tunis Time), to be submitted via email to FASTprocurementinbox@dai.com, and the RFP number and title of the activity "**Development of Debt Management Decision Support System – Phase 2**" must be stated in the subject line of the email. Cost and Technical proposals shall be submitted in separate emails. Late offers will be rejected except under extraordinary circumstances at DAI's discretion.

The submission to DAI of a proposal in response to this RFP will constitute an offer and indicates the Offeror's agreement to the terms and conditions in this RFP and any attachments hereto. DAI reserves the right not to evaluate a non-responsive or incomplete proposal.

3.2 Proposal Cover Letter

A cover letter shall be included with the proposal on the Offeror's company letterhead with a duly authorized signature and company stamp/seal using Attachment B as a template for the format. The cover letter shall include the following items:

- The Offeror will certify a validity period of 60 days for the prices provided.
- Acknowledge the solicitation amendments received.

3.3 Questions regarding the RFP

Each Offeror is responsible for reading and complying with the terms and conditions of this RFP. Requests for clarification or additional information must be submitted in writing via email or in writing to the Issuing Office as specified in the Synopsis above. No questions will be answered by phone. Any verbal information received from a DAI or (insert Project Acronym) employee or other entity shall not be considered as an official response to any question regarding this RFP.

Copies of questions and responses will be distributed in writing to all prospective bidders who are on record as having received this RFP after the submission date specified in the Synopsis above.

4. Instructions for the Preparation of Technical Proposals

Technical proposals shall be sealed in a separate envelope from cost/price proposals and shall be clearly labeled as "VOLUME I: TECHNICAL PROPOSAL".

Technical proposals shall include the following contents

1. Technical Approach

- Description of the proposed services which meets or exceeds the stated technical specifications or scope of work. The proposal must show how the Offeror plans to complete the work and describe an approach that demonstrates the achievement of timely and acceptable performance of the work.
- A detailed implementation plan incorporating the overall workload per project phase in a Gantt Chart with a complete list of deliverables to be provided. Activities naming and reference should be unique.
- A clear and detailed description of the methodology and approach of the project implementation to be used and a thorough proposal to achieve the priorities identified in the RFP.

2. Management approach
   - Proposed project team including solid experience for the project manager and the division of roles and responsibilities of its team members.

3. Personnel Qualifications
   - Academic and other professional qualifications, skills, relevant experience and suitability of the proposed team members.

4. Past Performance
   - Successful completion of at least three (3) software development projects with the front and back-end development tools and frameworks with similar size and complexity, as presented in the table in Attachment F. (10 points)
   - Relevant experience including pertinent references as presented in the offeror's response to bullet points in C (2) above. Response must address all the points listed in the instructions for Technical Proposals above. See Attachment F.

3.1 Services Specified

For this RFP, DAI is in need of the services described in Attachment A.

3.2 Technical Evaluation Criteria

Each proposal will be evaluated and scored against the evaluation criteria and evaluation sub-criteria, which are stated in the table below. Cost/Price proposals are not assigned points, but for overall evaluation purposes of this RFP, technical evaluation factors other than cost/price, when combined, are considered significantly more important than cost/price factors.

Evaluation Criteria	Evaluation Sub-criteria (if needed)	Maximum Points
Technical score		**100 points**
1-Technical Approach	- Description of the proposed services which meet or exceed the stated technical specifications or scope of work. (10 points) - A detailed implementation plan incorporating the overall workload per project phase in a Gantt Chart with a complete list of deliverables to be provided (5 points). Activities naming and reference should be unique. - A clear and detailed description of the methodology and approach of the project	20 points

	implementation to be used and a thorough proposal to achieve the priorities identified in the RFP. (5 points)	
2- Organizational Structure and Management Plan	- Proposed project team including solid experience for the project manager and the division of roles and responsibilities of its team members.	10 points
3- Personnel qualifications	- Academic and other professional qualifications, skills, relevant experience and suitability of the proposed team members.	40 points
4- Past Performance and Relevant Experience (to provide professional references)	- Successful completion of at least three (3) software development projects with the front and back-end development tools and frameworks with similar size and complexity, as presented in the table in Attachment F. (10 points) - Relevant experience including pertinent references as presented in the offeror's response to bullet points in C (2) above. (10 points) - Response must address all the points listed in the instructions for Technical Proposals above. (10 points)	30 points
Total Points		**100 points**

4. Instructions for the Preparation of Cost/Price Proposals

4.1 Cost/Price Proposals
Cost/Price proposals shall be sealed in a separate envelope from technical proposals, and shall be clearly labeled as "VOLUME II: COST/PRICE PROPOSAL".

Provided in Attachment C is a template for the Price Schedule, for firm-fixed price awards. Offerors shall complete the template including as much detailed information as possible. **Additionally, offerors shall provide daily rates for proposed staff.**

It is important to note that Value Added Tax (VAT) shall be included on a separate line and these services are eligible for VAT exemption under the DAI prime contract. The Subcontractor is responsible for all applicable taxes and fees, as prescribed under the applicable laws for income, compensation, permits, licenses, and other taxes and fees due as required.

5. Basis of Award

5.1 Best Value Determination
DAI will review all proposals, and make an award based on the technical and cost evaluation criteria stated above, and select the offeror whose proposal provides the best value to DAI. DAI may also exclude an offer from consideration if it determines that an Offeror is "not responsible", i.e., that it does not have the management and financial capabilities required to perform the work required.

Evaluation points will not be awarded for cost. Cost will primarily be evaluated for realism and reasonableness. DAI may award to a higher priced offeror if a determination is made that the higher technical evaluation of that offeror merits the additional cost/price.

DAI may award to an Offeror without discussions. Therefore, the initial offer **must contain the Offeror's best price and technical terms.**

5.2 Responsibility Determination

DAI will not enter into any type of agreement with an Offeror prior to ensuring the Offeror's responsibility. When assessing an Offeror's responsibility, the following factors are taken into consideration:

1. Provide evidence of the required business licenses to operate in the host country.
2. Evidence of an Unique Entity ID (SAM) (explained below and instructions contained in Attachment D).
3. The source, origin and nationality of the products or services are not from a Prohibited Country (explained below).
4. Having adequate financial resources to finance and perform the work or deliver goods or the ability to obtain financial resources without receiving advance funds from DAI.
5. Ability to comply with required or proposed delivery or performance schedules.
6. Have a satisfactory past performance record.
7. Have a satisfactory record of integrity and business ethics.
8. Have the necessary organization, experience, accounting and operational controls and technical skills.
9. Have the necessary production, construction and technical equipment and facilities if applicable.
10. Be qualified and eligible to perform work under applicable laws and regulations.

6. Anticipated post-award Deliverables

Upon award of a subcontract, the deliverables and deadlines detailed in below table will be submitted to DAI. The Offeror should detail proposed costs per deliverable in the Price Schedule. All of the deliverables must be submitted to and approved by DAI before payment will be processed.

Month 1

- L1: Project plan from proposal updated.
- L2: Draft functional specifications prepared
- L3: Monthly project report

Month 2

- L4: Project plan updated based on final functional specifications
- L5: Final functional specifications prepared
- L6: Draft of data model and ETL schema
- L7: Initial ETL scripts and data warehouse structures
- L8: Initial KPIs (up to 50 per functional specifications)
- L9: Monthly project report

Month 3

- L10: Updated data model
- L11: Updated ETL scripts and data warehouse structures
- L12: Updated KPIs per functional requirements

- L13: Draft dashboards (up to 4 per functional specifications)
- L14: Monthly project report

Month 4

- L15: Updated data model
- L16: Updated ETL scripts and data warehouse structures
- L17: Updated KPIs
- L18: Updated dashboards
- L19: Draft multidimensional report data structures and interfaces
- L20: Monthly project report

Month 5

- L21: Updated data model
- L22: Updated ETL scripts and data warehouse structures
- L23: Updated KPIs
- L24: Updated dashboards
- L25: Updated multidimensional report data structures and interfaces
- L26: Monthly project report

Month 6

- L27: Final data model
- L28: Successful testing of KPIs and dashboards
- L29: Successful testing of multidimensional report interfaces
- L30: Updated source code for ETLs, data warehouse, KPIs and dashboards
- L31: Updated multidimensional report data structures and interfaces
- L32: Monthly project report

Month 7

- L33: Completed implementation and integration
- L34: Completed training materials
- L35: Delivered training sessions
- L36: Final source coded deployed and in full operation
- L37: Monthly report

Month 8

- L38: Maintenance and support
- L39: Updated sourced coded (if there are changes)
- L40: Monthly report

Month 9

- L41: Maintenance and support
- L42: Updated sourced coded (if there are changes)
- L43: Monthly report

Month 10

- L44: Maintenance and support
- L45: Updated sourced coded (if there are changes)
- L46: Monthly report

This implementation schedule is designed to meet the specified 6-month development period, while allowing margins for ongoing monitoring and maintenance activities after deployment. Good monitoring and effective communication with the project team are essential to ensure that the project stays on track and on schedule.

7. Inspection & Acceptance

The designated DAI Project Manager will inspect from time to time the services being performed to determine whether the activities are being performed in a satisfactory manner, and that all equipment or supplies are of acceptable quality and standards. The subcontractor shall be responsible for any countermeasures or corrective action, within the scope of this RFP, which may be required by the DAI Chief of Party as a result of such inspection.

8. Compliance with Terms and Conditions

8.1 General Terms and Conditions
Offerors agree to comply with the general terms and conditions for an award resulting from this RFP. The selected Offeror shall comply with all Representations and Certifications of Compliance listed in Attachment G.

8.2 Prohibited Technology
Bidders MUST NOT provide any goods and/or services that utilize telecommunications and video surveillance products from the following companies: Huawei Technologies Company, ZTE Corporation, Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company, or any subsidiary or affiliate thereof, in compliance with FAR 52.204-25.

8.3 Source and Nationality
Under the authorized geographic code for its contract DAI may only procure goods and services from the following countries.

Geographic Code 937: Goods and services from the United States, the cooperating country, and

"Developing Countries" other than "Advanced Developing Countries: excluding prohibited countries. A

list of the "Developing Countries" as well as "Advanced Developing Countries" can be found at:

http://www.usaid.gov/policy/ads/300/310maa.pdf and

http://www.usaid.gov/policy/ads/300/310mab.pdf respectively.

DAI must verify the source and nationality of goods and services and ensure (to the fullest extent possible) that DAI does not procure any goods or services from prohibited countries listed by the Office of Foreign Assets Control (OFAC) as sanctioned countries. OFAC sanctioned countries may be searched within the System for Award Management (SAM) at www.SAM.gov. The current list of countries under comprehensive sanctions include: Cuba, Iran, North Korea, Sudan, and Syria. Goods may not transit through or be assembled in comprehensive sanctioned origin or nationality countries, nor can the vendor be owned or controlled by a prohibited country. DAI is prohibited from facilitating any transaction by a third party if that transaction would be prohibited if performed by DAI.

By submitting a proposal in response to this RFP, Offerors confirm that they are not violating the Source and Nationality requirements of the goods or services being offered and that the goods and services comply with the Geographic Code and the exclusions for prohibited countries outlined above.

8.4 Unique Entity ID (SAM)

There is a **mandatory** requirement for your organization to provide an Unique Entity ID (SAM)to DAI. Without an Unique Entity ID (SAM), DAI cannot deem an Offeror "responsible" to conduct business with and therefore, DAI will not enter into a subcontract/purchase order or monetary agreement with any organization. The determination of a successful offeror/applicant resulting from this RFP/RFQ/RFA is contingent upon the winner providing an Unique Entity ID (SAM)to DAI. Offerors who fail to provide Unique Entity ID (SAM)will not receive an award and DAI will select an alternate Offeror.

All U.S. and foreign organizations which receive first-tier subcontracts/ purchase orders with a value of $30,000 and above **are required** to obtain an Unique Entity ID (SAM)prior to signing of the agreement. Organizations are exempt from this requirement if the gross income received from all sources in the previous tax year was under $300,000. DAI requires that Offerors sign the self-certification statement if the Offeror claims exemption for this reason.

For those required to obtain an Unique Entity ID (SAM), see Attachment D - Instructions for Obtaining an Unique Entity ID (SAM)- DAI'S Vendors, Subcontractors

For those not required to obtain an Unique Entity ID (SAM), see Attachment E: Self Certification for Exemption from Unique Entity ID (SAM)Requirement

9. Anti-Corruption and Anti-Bribery Policy and Reporting Responsibilities

DAI conducts business under the strictest ethical standards to assure fairness in competition, reasonable prices and successful performance or delivery of quality goods and equipment. **DAI does not tolerate the following acts of corruption:**

- Any requests for a bribe, kickback, facilitation payment or gratuity in the form of payment, gift or special consideration by a DAI employee, Government official, or their representatives, to influence an award or approval decision.
- Any offer of a bribe, kickback, facilitation payment or gratuity in the form of payment, gift or special consideration by an offeror or subcontractor to influence an award or approval decision.
- Any fraud, such as mis-stating or withholding information to benefit the offeror or subcontractor.
- Any collusion or conflicts of interest in which a DAI employee, consultant, or representative has a business or personal relationship with a principal or owner of the offeror or subcontractor that may appear to unfairly favor the offeror or subcontractor. Subcontractors must also avoid collusion or conflicts of interest in their procurements from vendors. Any such relationship must be disclosed immediately to DAI management for review and appropriate action, including possible exclusion from award.

These acts of corruption are not tolerated and may result in serious consequences, including termination of the award and possible suspension and debarment by the U.S. Government, excluding the offeror or subcontractor from participating in future U.S. Government business.

Any attempted or actual corruption should be reported immediately by either the offeror, subcontractor or DAI staff to:

- Toll-free Ethics and Compliance Anonymous Hotline at (U.S.) +1-503-597-4328

- Hotline website – www.DAI.ethicspoint.com, o
- Email to Ethics@DAI.com
- USAID's Office of the Inspector General Hotline at hotline@usaid.gov.

By signing this proposal, the offeror confirms adherence to this standard and ensures that no attempts shall be made to influence DAI or Government staff through bribes, gratuities, facilitation payments, kickbacks or fraud. The offeror also acknowledges that violation of this policy may result in termination, repayment of funds disallowed by the corrupt actions and possible suspension and debarment by the U.S. Government.

10. Attachments

10.1 Attachment A: Scope of Work for Services or Technical Specifications

1. Project presentation

Public debt management is an essential component of Tunisia's economic and financial stability. In an ever-changing world, the need to make informed and strategic decisions concerning public debt has become more crucial than ever. In response to this demand, FAST launched a project to develop a decision-making platform for public debt management with the aim of providing government decision-makers with a powerful and effective tool to assess, anticipate and manage public debt accurately and efficiently. The first phase of this development was completed by the end of December 2022. This scope of work (SOW) represents the continued development of the Debt Management DSS.

This activity is part of the **FAST** project, financed by USAID. The FAST project was designed to strengthen Tunisia's public financial management capabilities through a reform of the public financial management information systems (PFMIS). This reform also includes the modernization of the internal (SBT) external debt information system (SIADE) managed by the Information System Center of the Ministry of Finance (CIMF).

The FAST project comprises several components aimed at modernizing and improving public financial management in Tunisia in general, and debt management in particular. Key components include:

1. **PFMIS reform:** The modernization of the PFMIS aims to simplify administrative processes, improve transparency and efficiency in financial management, and promote internal and external interoperability.
2. **SIADE modernization:** The external debt information system (SIADE) managed by CIMF is at the heart of public debt management. Its modernization aims to integrate analytical and strategic decision-making component to improve the management of the Tunisian government's external debt.
3. **Training and skills enhancement:** The FAST project also includes training initiatives aimed at strengthening the skills of civil servants and experts in public financial management. This will enable the government to make better use of new technologies and modern financial management tools.
4. **Institutional Capacity Building:** The project aims to strengthen the institutional capacities of CIMF and other key players involved in public financial management. This will facilitate the successful implementation of reforms and the adoption of new management practices.
5. **Development of the Decision-Making Platform for Debt Management:** This major component of the FAST project focuses on the development of a decision-making platform for the strategic management of public debt. Phase 1 of this development, presented in this introduction, lays the technological and conceptual foundations for this transformation.

2. Phase 2 Components

As part of Phase 1 of the project to develop the Debt Management DSS, several components were developed to lay the foundations for the transformation of public debt management, including:

1. **Building a Centralized Data Warehouse (DWH):** The inaugural phase focused on building a comprehensive data infrastructure. This involved setting up a centralized data warehouse to store and manage financial data relating to public debt. The data comes from the SIADE and SBT systems, dedicated to external and internal debt management respectively. By collecting, transforming and integrating operational debt data, this data warehouse provides a reliable source of up-to-date information, confirmed by testing carried out during phase 1.

2. **Dashboards:** In phase 1, initial dashboards were developed to visually present the key public debt indicators. These dashboards provided an overview of the data, enabling users to quickly visualize trends and variations in the financial figures. The dashboards cover a wide range of functional areas in both external and internal debt management. The dashboards developed mainly cover the areas of front office, back office, guaranteed debt, domestic debt, loans granted and assigned external debt.
3. **Basic Visualizations:** Basic visualizations, such as graphs and tables, were created to represent the data in a user-friendly way. These visualizations enabled users to better understand debt composition, interest rates, repayment schedules and other important aspects.
4. **Indicators:** Numerous performance indicators have been defined to assess debt sustainability and identify important trends. These indicators have provided a basic understanding of the current public debt situation.
5. **Automated Data Extraction:** To ensure that data is regularly updated, extraction, transformation and loading (ETL) procedures have been implemented. This automated the process of updating data from a variety of sources.
6. **Data Security:** Data security has been a major concern. Security measures have been put in place to ensure that sensitive financial data are protected from unauthorized access.
7. **Testing and Validation:** The components developed have been subjected to extensive testing and validation to ensure their accuracy, correct operation and user-friendliness.

The components developed during phase 1 have laid the technological and conceptual foundations for the debt management DSS. They enabled decision-makers and analysts to begin exploring financial data, visualize the first indicators and familiarize themselves with the platform's interface. The next phase will enhance interfaces and dashboards, update the data warehouse and ETLs, develop additional KPIs and .

The following technologies will be used in the second phase:

- ORACLE RDBMS: for data storage (STG, DWH).
- SQL SERVER ENTREPRISE EDITION (WITH SA): Microsoft data platform comprising the following components:
- SSIS: Microsoft ETL tool.
- SQL Agent: Tool for planning and executing data loading and refreshing flows.
- SSAS Tabular: Tool for creating tabular cubes in memory.
- Power BI Report Server: Dashboard creation tool.

For more technical details, please refer to the technical architecture appendix (10.1 Attachment A: Scope of Work for Services or Technical Specifications, Appendix 1: Technical architecture page 25).

By providing sophisticated, user-friendly visualization tools, the platform has enabled government decision-makers to move from intuition-based to evidence-based management. Increased transparency and the ability to anticipate trends and risks have laid the foundations for better public debt management and sustainable economic stability. Phase 2 of the project, described below, aims to update the DSS and add important indicators for even more strategic and proactive management of public debt.

3. Phase 2: Advanced Development of the Decision-Making Platform
a. Phase 2 objective:

The main objective of phase 2 is to enhance and extend the functionalities of the DSS platform for the strategic management of public debt, capitalizing on the solid foundation established during phase 1 of the project. This phase aims to provide decision-makers with more powerful, sophisticated and

comprehensive tools for assessing, anticipating and managing the complex and varied aspects of public debt.

b. Objectives for Phase 2:

1. **Expansion of Functional Dashboards:** This stage aims to complete the development of dashboards for the remaining functional areas that were not fully covered in phase 1 or were only partially developed. These dashboards will provide in-depth visibility of key indicators and metrics specific to each area, enabling more targeted and in-depth analysis.
2. **Enhanced Dimensions and Indicators: The** aim here is to extend and enrich existing modeling dimensions and indicators. By introducing new dimensions such as residual debt duration, weighted average interest rates and interest rate types, the platform will offer a more comprehensive and detailed representation of debt structure. This will enable more nuanced analysis and more informed decision-making, particularly with strategic indicators.

In short, phase 2 will build on the foundations laid in phase 1, taking the Public Debt Management Decision-Making Platform to the next level.

4. Stages of Phase 2:

Managing a project to develop the Decision-Making Platform for Debt Management requires an organized sequence of actions. Phase 2 of this project is being rolled out in of the following stages. Each stage is defined to ensure a smooth and efficient transition:

- **Stage 1: Project Planning:** In this stage, the project team develops a detailed plan to guide all future activities. The main deliverable is a project plan that will be used to monitor and manage the project. Main activities must be identified, milestones and delivery dates highlighted, resources assigned, and counterpart engagement documented.
- **Stage 2: Requirements Gathering and Snalysis:** The team interacts with users and stakeholders to understand their needs in terms of data, indicators, dashboards and reports. Functional specifications are drawn up, detailing requirements in terms of data sources, update frequency, types of visualizations, and so on. The requirements must be agreed among the vendor, DAI and counterparts at the MOF and signed off in writing.
- **Stage 3: Data Warehouse Design:** At this stage, data architects and interface designers work on creating a conceptual data model that represents the relationships between the various data sources. The ETL schema is also developed to define how data will be extracted from sources, transformed and loaded into the data warehouse.
- **Step 4: DSS development:** Developers come into play to code ETL scripts, implement data transformations and create report and dashboard templates. This stage also involves the integration of selected business intelligence tools, such as data visualization platforms.
- **Step 5: Dynamic Reports: Analysts and decision-makers need easy access to data in flexible formats to perform dynamic and ad hoc analyses as needed. To facilitate dynamic reporting, subject-matter data marts will be designed and implemented.**
- **Stage 5: Implementation and Integration:** The solution is implemented in the target environment. Data is loaded into the warehouse, and reports/dashboards are made available to users.
- **Step 6: Testing and Validation:** Rigorous testing is carried out to verify data accuracy, calculation precision and report/dashboard functionality. Errors are identified and corrected, and performance is evaluated to ensure that the solution functions correctly under real-life conditions.
- **Step 7: Deployment:** The final version of the project is deployed in the production environment, where end users can access it. All configurations and settings are finalized to ensure an optimal user experience.

- **Step 8: User training:** End-users are trained to make effective use of the solution's reports, dashboards and functionalities. Training sessions are organized to teach them how to navigate the interface, interact with the data and generate insights.
- **Step 9: Monitoring and maintenance:** A maintenance plan is drawn up to ensure that data remains up-to-date, performance is maintained, and any problems are quickly resolved. Periodic updates may be required to meet changing user needs.

5. Phase 2 Deliverables:

Phase 2 of the project to develop a DSS for Debt Management is an important step to enhance functionality, build extra capacity, and ensure sustainability. Each step in this phase is accompanied by specific deliverables that serve as concrete milestones for the project's progress for the realization of a stailored Debt Management DSS aligned with the needs of the MoF and effectively supported by the CIMF.

Step	Deliverable	Description
Step 1: Project plan	L1: Project work plan	Based on the RFP requirements and the vendors proposed work plan, the activity schedule and resource requirements will be discussed and agreed with counterparts. An updated work plan will be submitted as L1.
Step 2: Requirements gathering and analysis	L 2: Functional specifications document	This document describes in detail the needs of users and stakeholders in terms of data, reports, dashboards and functionalities. It in particular defines the necessary data sources and structures, key performance indicators, dashboard requirements, visualizations and multi-dimensional reporting interfaces.
Step 3: Solution design	L 3: Data model and ETL schema	The data model represents the relationships between the various data sources and the warehouse tables. The ETL schema defines how data will be extracted, transformed and loaded into the data warehouse, including the transformations to be applied.
Step 4: Component development	L 4: ETL scripts and implementation of data warehouse	Coded ETL scripts enable data extraction, transformation and loading. Based on the data model and ETLs, the data warehouse will be implemented, including subject-oriented data cubes.
Step 5: KPIs, dashboards and multi-dimensional reporting	L5: KPIs, dashboards and multi-dimensional interfaces	KPIs, dashboards and multi-dimensional interfaces defined in the functional specifications will be implemented to support dashboards.
Step 6: Implementation and integration	L 6: Establishing DSS environment	The Debt Management DSS environment is configured and operational, ready to receive data. Data is loaded into the warehouse and

Step	Deliverable	Description
		reports/dashboards/mult-dimensional interfaces are made available to users. Integration with other systems is also complete as defined in the functional requirements.
Step 7: Testing and validation	L 7: Test and validation reports	Test plans will be prepared to validate data accuracy, report/dashboard functionality and overall solution performance and completeness. Identified errors are logged, corrected and retested.
Step 8: User training	L 8: Training materials and sessions	Training materials include user guides, tutorials and manuals to help end-users learn how to interact with reports, dashboards and functionality. Training sessions are organized to ensure that users are comfortable with the solution.
Step 9: Deployment	L 9: Final project version deployed	The final version of the project is deployed in the production environment. All configurations and settings are verified to ensure optimal user experience and continued accessibility for end-users.
Step 10: Maintenance and support	L 10: Maintenance and support post deployment	A maintenance and support plan, as proposed by the vendor, ensures the continued availability of data and reports, and the rapid resolution of any problems. Monitoring reports document issues that are resolved.

The schedule for each deliverable is highlighted below, along with required updates.

6. Phase 2 schedule:

Here is the project timetable for the development of the Debt Management DSS with associated deliverables:

Deliverables Schedule

Month 1

- L1: Project plan from proposal updated.
- L2: Draft functional specifications prepared
- L3: Monthly project report

Month 2

- L4: Project plan updated based on final functional specifications
- L5: Final functional specifications prepared
- L6: Draft of data model and ETL schema
- L7: Initial ETL scripts and data warehouse structures

- L8: Initial KPIs (up to 50 per functional specifications)
- L9: Monthly project report

Month 3

- L10: Updated data model
- L11: Updated ETL scripts and data warehouse structures
- L12: Updated KPIs per functional requirements
- L13: Draft dashboards (up to 4 per functional specifications)
- L14: Monthly project report

Month 4

- L15: Updated data model
- L16: Updated ETL scripts and data warehouse structures
- L17: Updated KPIs
- L18: Updated dashboards
- L19: Draft multidimensional report data structures and interfaces
- L20: Monthly project report

Month 5

- L21: Updated data model
- L22: Updated ETL scripts and data warehouse structures
- L23: Updated KPIs
- L24: Updated dashboards
- L25: Updated multidimensional report data structures and interfaces
- L26: Monthly project report

Month 6

- L27: Final data model
- L28: Successful testing of KPIs and dashboards
- L29: Successful testing of multidimensional report interfaces
- L30: Updated source code for ETLs, data warehouse, KPIs and dashboards
- L31: Updated multidimensional report data structures and interfaces
- L32: Monthly project report

Month 7

- L33: Completed implementation and integration
- L34: Completed training materials
- L35: Delivered training sessions
- L36: Final source coded deployed and in full operation
- L37: Monthly report

Month 8

- L38: Maintenance and support
- L39: Updated sourced coded (if there are changes)

- L40: Monthly report

Month 9

- L41: Maintenance and support
- L42: Updated sourced coded (if there are changes)
- L43: Monthly report

Month 10

- L44: Maintenance and support
- L45: Updated sourced coded (if there are changes)
- L46: Monthly report

This implementation schedule is designed to meet the specified 6-month development period, while allowing margins for ongoing monitoring and maintenance activities after deployment. Good monitoring and effective communication with the project team are essential to ensure that the project stays on track and on schedule.

7. Team composition:

Team member	Role	Allocations	Required qualifications	Recommended experience
BI Project Manager (35%)	Responsible for the planning, coordination and overall management of the Debt Management Decision-Making Platform development project.	• Define project objectives and deliverables in consultation with stakeholders. • Develop the project plan, establish timelines and resource requirements. • Supervise the team and manage project risks. • Ensure compliance with requirements. • Communicating with stakeholders.	Diploma in project management, computer science, business management or related field.	Minimum 10 to 15 years' experience in project management, preferably in business intelligence or data analysis. Knowledge of project management methodologies Excellent communication and problem-solving skills.
BI Analyst (full time)	Understand business requirements and translate them into technical specifications for reports and dashboards.	• Collect and analyze business requirements. • Create detailed functional specifications for reports and visualizations. • Collaborate with the development team to ensure consistency. • Make sure visualizations are clear.	Degree in statistics, computer science, applied mathematics or related field.	Minimum 2 to 4 years' experience in data analysis or similar role. Proficiency in BI tools (Microsoft Power BI suite, SSIS , SSAS, Microsoft SSMS SQL SERVER Enterprise). Proficiency in data processing and SQL query language.
2 BI Developers (full time)	Design and develop ETL solutions, data warehouses and data visualizations.	• Design and develop ETL flows to extract, transform and load data. • Create and manage data structures and models. • Develop reports and interactive visualizations.	Programming skills, including SQL, C#, Python or Java. DAX language	Minimum 2 to 4 years' experience in developing BI, ETL or data engineering solutions. Knowledge of ETL concepts and experience with tools (mainly SSIS, SSAS and SSMS SQL SERVER Enterprise). Familiarity with Power BI and data warehouses.

Team member	Role	Allocations	Required qualifications	Recommended experience
		• Ensuring quality and performance.		
Database engineer (50% based on agreed schedule)	Design, manage and optimize databases hosting data for reports and dashboards.	• Design and create databases according to project requirements • Manage data security by implementing protection measures. • Optimize database performance. • Ensure data backup and recovery.	Knowledge of relational database design and modeling.	Minimum 3 to 5 years' experience in database management, administration or engineering. Experience with database management systems mainly (r SQL SERVER Enterprise). Understanding of data security and performance optimization best practices.
Data Security Analyst (part-time based on agreed schedule)	Ensure data security and compliance in the Debt Management Decision Platform solution.	• Assess data security risks and develop strategies to mitigate them. • Implement security measures, including encryption and access management. • Check compliance with data protection regulations. • Monitor and audit data security activities.	Knowledge of data security, cryptography and regulatory compliance.	Minimum 3 to 5 years' experience in data security. Experience in implementing data security measures in BI projects.

Each team member has specific responsibilities to ensure the success of the project as a whole, contributing to the design, development, security, user experience and overall project management of the Debt Management Decision-Making Platform.

These recommended qualifications and experience will serve as a guide for recruiting competent and qualified members for each role within the Debt Management DSS development team.

Implementation of a decision-making information system for Debt Management

TECHNICAL ARCHITECTURE DOCUMENT

Reference	ARCHITECTURE.docx		
Version	V02	**Number of pages**	19
Revision date		**Creation date**	16/08/2022

Validation					
Issuer / Editor		**Auditor**		**Approver**	
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A. Chaari	31/05/2022				

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Version	Date	Purpose of the version
0.1	31/05/2022	Initial version
2.0	16/08/2022	Updated version
2.1	28/11/2022	Updated version
2.2	00/00/2022	Updated version
3.0	00/00/2022	Updated version

Mailing list

Company	Name	Role

TABLE OF MATERIALS

1 INTRODUCTION

1.1 PURPOSE OF THE DOCUMENT

The purpose of this document is to define the technical architecture to be implemented at CIMF as part of the performance management project for debt and financial cooperation. It presents the functional architecture, the target architecture, describes the software components and provides a list of configuration requirements for each software component.

1.2 AREA OF APPLICATION

This document is intended for :
- ▶ System technical managers
- ▶ Teams responsible for system development, integration and production launch
- ▶ Architecture / Networks team managers
- ▶ Production managers in charge of system operation.
- ▶ To accommodation managers

1.3 BACKGROUND AND OBJECTIVES

The Ministry of Finance, created in 1882, is a Tunisian ministry responsible for managing the country's finances. Its main mission is to develop and implement the State's financial, monetary and fiscal policy.

As part of a progressive approach aimed at improving performance, the Centre Informatique du Ministère des Finances (CIMF) is responsible for implementing the Ministry of Finance's IT strategy.

Through this project, the CIMF aims to set up a decision-making information system to manage performance in terms of debt and financial cooperation.

The aim of this project is to set up a business intelligence system that collects and processes data, transforms it into information and disseminates it in the form of dashboards to guarantee a global view of profitability.

Through this project, the CIMF wishes to :
- Ensure the security and availability of information systems,
- Modernize information systems and ensure their sustainability,
- Guarantee efficient support for information systems operations,

- Consolidate the skills of its human resources to keep abreast of technological developments and constantly strive to improve service quality.

2   ARCHITECTURAL OVERVIEW

2.1   FUNCTIONAL ARCHITECTURE
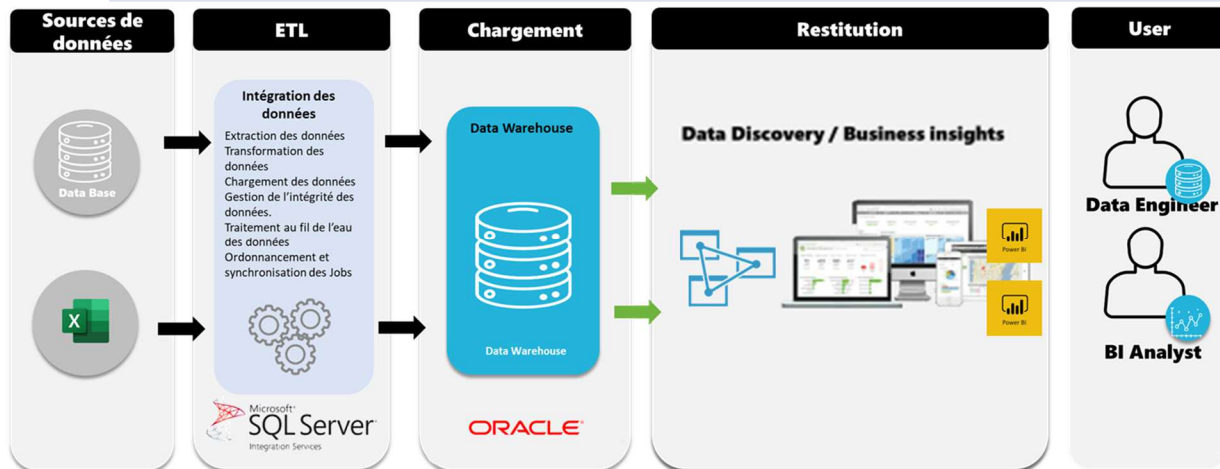
The functional architecture is divided into 4 layers:

1. **Data sources** :

 The main data sources made available and to which the ETL will connect are :
   - Excel files: via the "MS ACE OLE DB" connector
   - Databases :
     - SIAD (debt management) : Oracle
     - ADAB (budget management) : Oracle

The definitive list of IP addresses and ports from the business IS will be completed (updated) after the technical workshops and connection tests.

2. **ETL**

The Extract-Transform-Load layer describes file sharing and data extraction processes, as well as validation, integration and transformation processes to ensure that data is properly formatted for loading into the various SID storage areas (ODS, DWH, etc.).

3. **Loading**

This layer will store and manage data, ensuring scalability:
   - ODS: is the integration layer that integrates data to ensure the scalability of the Data Warehouse. It centralizes all the raw data acquisition and transformation processes required to feed the DWH. Files integrated into the ODS must be archived on a shared space once

they have been integrated. This space can be purged according to a configurable retention period.

■ The Data Warehouse: this is the organizational layer that centralizes information in a readable model and ensures consistency. Jobs will need to be developed to ensure the archiving, recovery and purging of data from the Data Warehouse.

4. **Restitution**

This layer enables information to be retrieved and made accessible, depending on user access rights, by enabling users to view and analyze the data in the Data Warehouse layer. This layer offers several functionalities, such as :

- Drill down
- Dynamic filters
- BI self-service
- Visualization in the form of graphs, tables, maps, etc.
- Contextual navigation
- Access via mobile devices
- Data storytelling
- ...

2.2 ARCHITECTURAL CONSTRAINTS & EXCELLENCE

In order to comply with the functional architecture of the project and to align with the technical requirements expressed by the CIMF both in the specifications and during the technical workshops, the list below has been drawn up to include all the technical requirements and constraints identified:

- Separate roles for applications, databases, presentation layer, proxy, etc.

- The solution must be installed on the latest OS versions

- Business users can tolerate xxx h downtime for the BI platform (to be defined)

The solution must comply with the following security requirements expressed in the CDC :
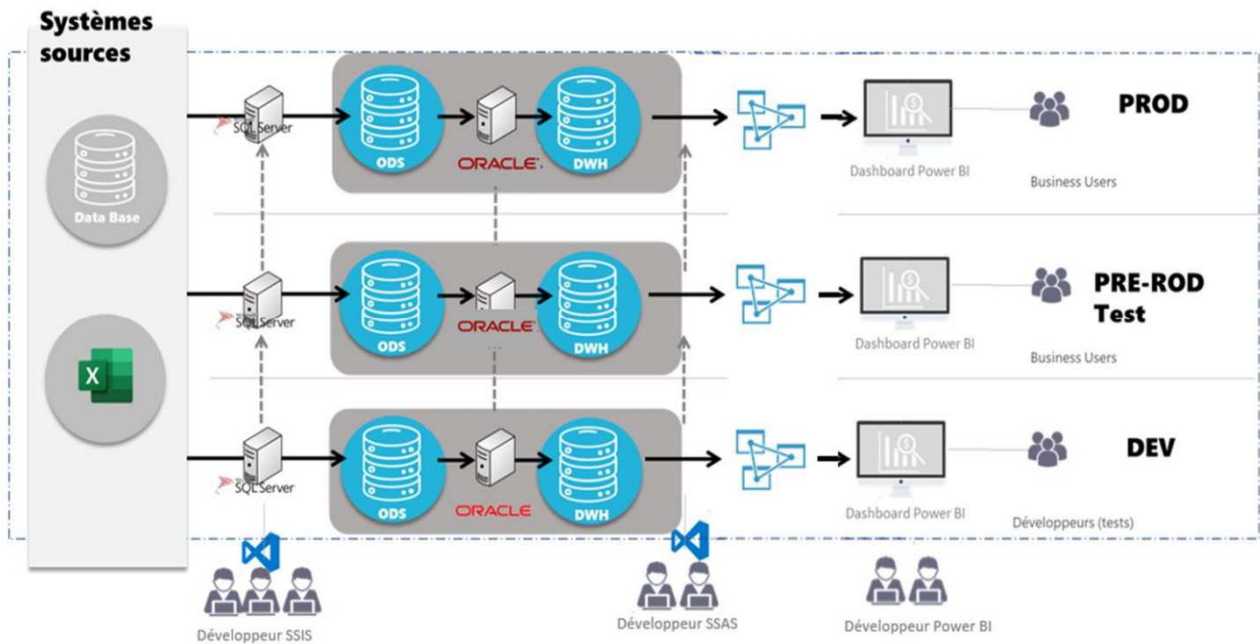
Themes	Safety requirements
Identification & Authentication	
Rights and access management	

Configuration management	
Confidentiality & Data integrity	
Business Control	
Alert scenarios	

In line with CIMF requirements in terms of environments, and to align with standards and best practices, 2 separate environments are planned:

1.   Development

2.   Production

The technologies selected for this project are :

ORACLE RDBMS: for data storage (STG, DWH).

**SQL SERVER ENTREPRISE EDITION (WITH SA)**: Microsoft Data Platform with

- **SSIS**: Microsoft's ETL tool

- **SQL Agent**: tool for planning and executing data loading and refreshing flows

- **SSAS Tabular**: tool for creating tabular cubes (In memory)

- **Power BI Report Server:** Dashboard creation tool

3   TECHNICAL ARCHITECTURE

3.1   SSIS TECHNICAL ARCHITECTURE OVERVIEW

The data integration platform (Microsoft SQL SERVER) will be deployed on both Development and Production environments.

The diagram below details the components to be deployed on the data integration platform in each environment.
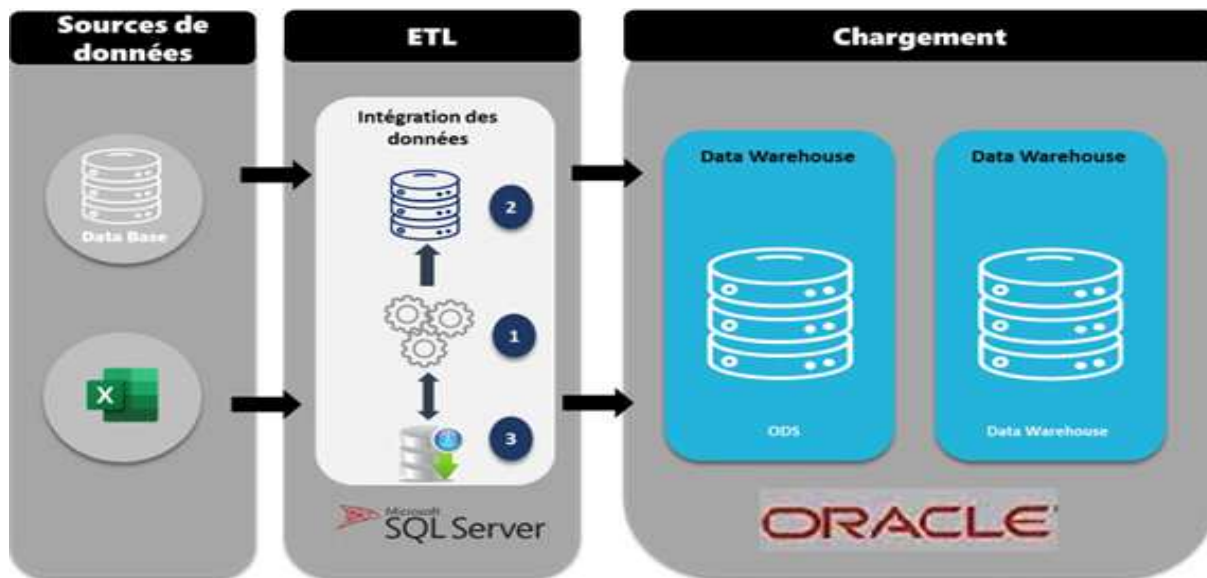
1. The **SSIS** service: This is the service or ETL engine that interprets the contents of the packages and launches the appropriate processing, from the data sources, through the transformations and on to the targets.

2. **SQL Server** service **(RDBMS)**: the SQL Server database engine will be used to :

    - Managing the Audit database: dedicated to data control and rejections

    - Manage the Admin database: dedicated to package settings and processing logs

- Catalog database management: system database used by SSIS for package deployment and management

3. SQL Agent service: this is the service that will be responsible for scheduling and launching SSIS packages.
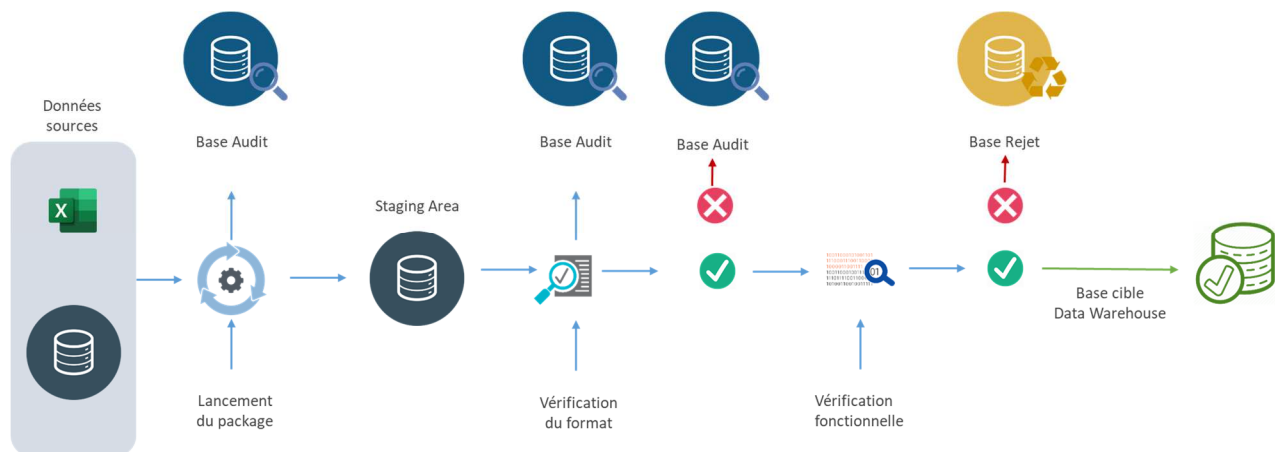
3.2 THE DATA WAREHOUSE

The data warehouse will be composed mainly of two layers:

- **Staging Area (ODS)**:

Temporary and volatile storage area. It is essentially used to store source data in database format. This layer is essentially used to format and type the data so that it can be manipulated later (join, filter, etc.) and minimize the impact of processing on the source systems. Data is checked at the STG level before being loaded into the target. This zone is generally reset to zero for each new process.

- **Data Warehouse (DWH)**:

A definitive, non-volatile storage area, covering several years' worth of history and covering all areas of the company (HR, finance, operations, etc.). Data at DWH level is reliable and traceable.

The Data Warehouse: Central database vs. multiple databases

By definition, the Data Warehouse is a database dedicated to storing all the data used for decision-making and decision analysis. It brings together all the company's data, in all fields.

According to best practice in the implementation of BI systems, all data must be integrated into a single database, the Data Warehouse. All data must go through a common process of control, cleansing, etc. before being fed into the DWH.

In general, the DWH is not accessible by end-users (or business users). Data is accessed via the BI solution (POWER BI). It is at the level of the restitution layer that security rules will be implemented, guaranteeing that data is watertight.

As part of this project, we strongly recommend implementing a centralized data warehouse. This approach will enable :

- Standardize the data integration process

- Standardize and share repositories and analysis tools between different entities.

- Facilitate the cross-referencing of data from several entities

- Facilitate cross-fertilization of data between different domains

- Facilitate data consolidation

- Etc.

3.3 OVERVIEW OF THE TECHNICAL ARCHITECTURE OF POWER BI REPORT SERVER

Power BI Report Server is a local report server with a web portal where you view and manage reports and KPIs. It comes with the tools you need to create Power BI reports, paginated reports, mobile reports and KPIs. Your users can access these reports in a variety of ways: view them in a web browser or on a mobile device, or as an e-mail in their inbox.

Power BI Report Server is similar to the Power BI service. It is an on-premise server platform. With Power BI Report Server, organizations can secure their data.
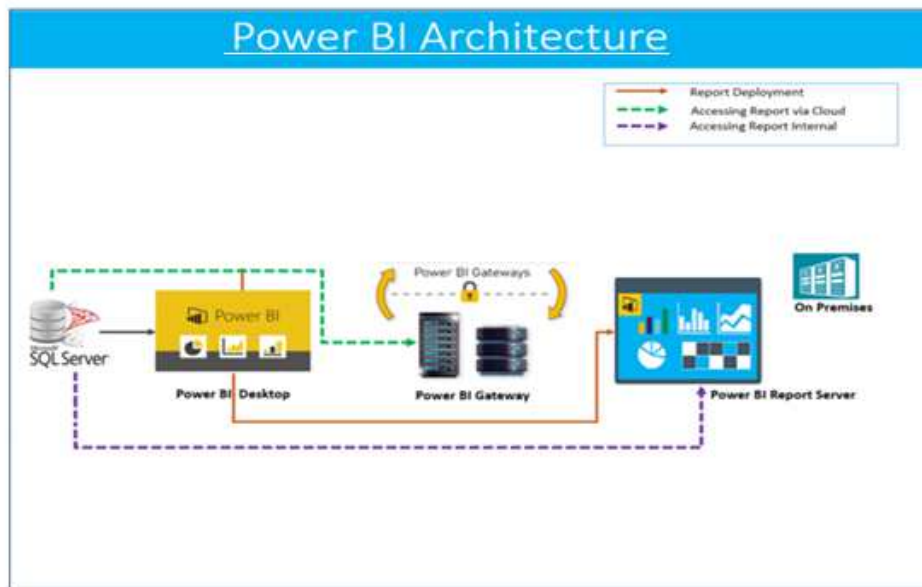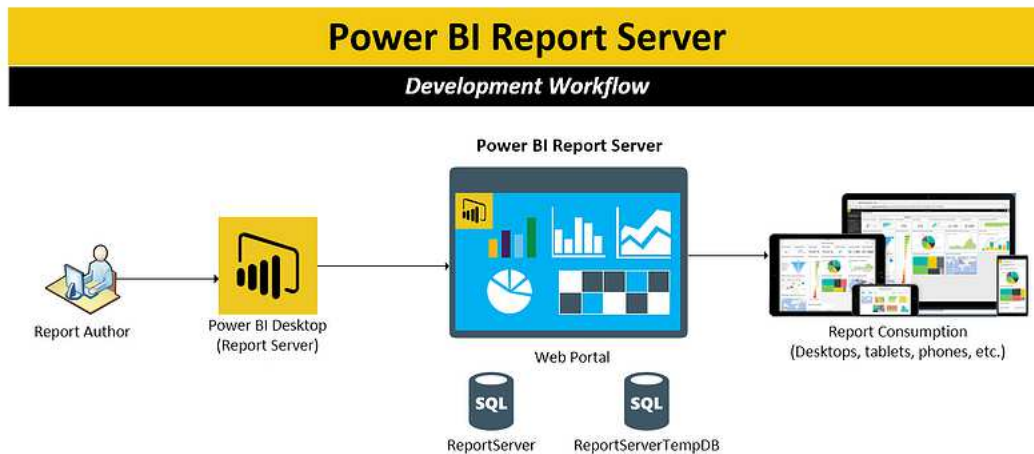

With this solution we can :

- Creating reports with **Power BI Desktop**
- Publishing interactive reports on **Power BI Server**
- View and analyze reports in a web browser, on mobile devices, or on tablets

The architecture can be divided into 2 parts: Power BI Desktop and Power BI Server

- **Power BI Desktop**

This is the Windows application where the user performs operations on data and creates applications with the required visualizations.

- **Power BI Server**

This is where business users connect to the solution and consult dashboards for analysis.

There are many advantages to using Power BI Report Server. It is compatible with the Power BI service, and you can easily integrate it with your existing reports. What's more, the on-premises Report Server is preferred by many organizations from a security point of view. Organizations find it safer to host important reports on a secure on-premise solution rather than in the cloud.

To provide web access to solution users, PBIRS has its own web server, which regularly calls on its Proxy service for authentication and session management.

4 POWER BI REPORT SERVER

4.1 POWER BI REPORT SERVER COMPONENTS

Several important components are associated with a report server. Find out more about them in the sections below:

- **Internet portal**

The Web portal is designed to display reports hosted on the Power BI report server. You can access the Web portal from any modern browser. In the Web portal, all reports and KPIs are uploaded to the report server.

Using the web portal, you can perform several actions such as accessing reports on demand, subscribing to published reports, applying custom branding to the web portal and scheduling report processing. The web portal provides a variety of content such as Power BI reports, mobile reports, paginated reports, KPIs and Excel workbooks. These different types of reports are organized in the same order in the traditional folder hierarchy. Reports are grouped by report type, as previously mentioned.

- **Power BI reports**

The most important part of the whole concept is the Power BI reports. Power BI reports are multi-page information files that represent a data model via visualizations. Power BI Desktop offers many types of visualization that you can use to create a report. A report can have several pages with any number of visualizations you wish to use.

You can create reports (.pbix) on Power BI Desktop (optimized for Report Server). Later, you can publish these Power BI reports on the Web portal for others to view and use. Business and other users can obtain important information and insights from these reports.

In addition, it has the unique ability to deploy and use mobile reports (.rsmobile) , paginated reports (.rdl) and KPIs.

- **Paginated reports**

A paginated report is an organized report of a paginated document. The extension used for the pagination file is .rdl. Paginated reports are saved as paginated documents in which you can expand the document vertically and horizontally to see the complete data. These reports are ideal for fixed layout pixels. This may be the best option if you wish to print a report from a PDF or Word file.

- **Mobile reports**

The second type of report that the server hosts and publishes on its web portal are mobile reports. They are similar to Power BI reports, but can be adapted to the screen of the mobile device on which they are viewed.

5 ENVIRONMENTS & SIZING

5.1 SOFTWARE REQUIREMENTS

The software requirements mentioned in the following paragraphs apply to all environments (DEV & PROD).

5.1.1 SSIS AND SSAS SERVER REQUIREMENTS

The latest versions of SSIS and SSAS will be installed, i.e. SSIS/ SSAS with Visual Studio 2019, with the SSDT extension.

Software	Description
OS	Windows Server 2019 Standard
.net FrameWork	NET edition 4.8.2 (included in OS)

List of services to be installed :

- SQL SERVER Agent
- SQL SERVER Data Base Engine
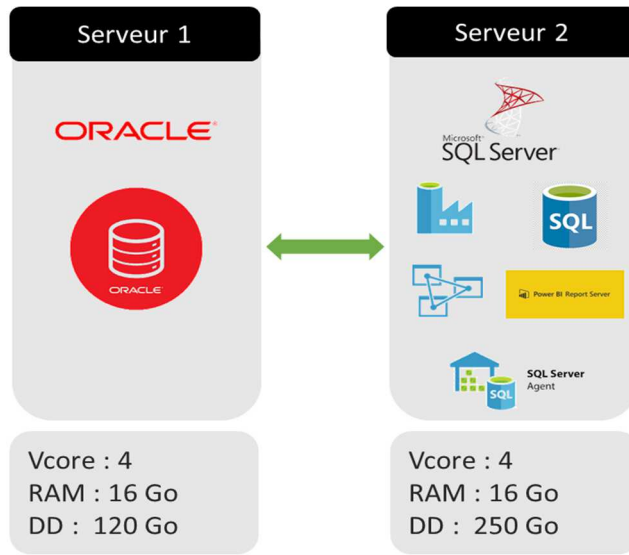- SQL SERVER Integration Services
- SQL SERVER Analysis Services Tabular

A detailed installation document will be supplied with the various steps and components to be installed.

Port 135 tcp is used by SSIS and must be open.

5.2 HARDWARE REQUIREMENTS

5.2.1 DEVELOPMENT ENVIRONMENT

SERVER	OS	RAM	CPU	STORAGE	Services
Server 1	Linux 7	16 GB	4 Vcores	120 GB	Oracle RDBMS: STG/DWH
Server 2	Windows 2019	16 GB	4 Vcores	250 GB	SQL SERVER RDBMS: SSIS and RS catalog SSIS: ETL SSAS Tabular: Tabular cube Power BI Report Server: Data Visualisation SQL Agent : Scheduler

5.2.2   PRODUCTION ENVIRONMENT
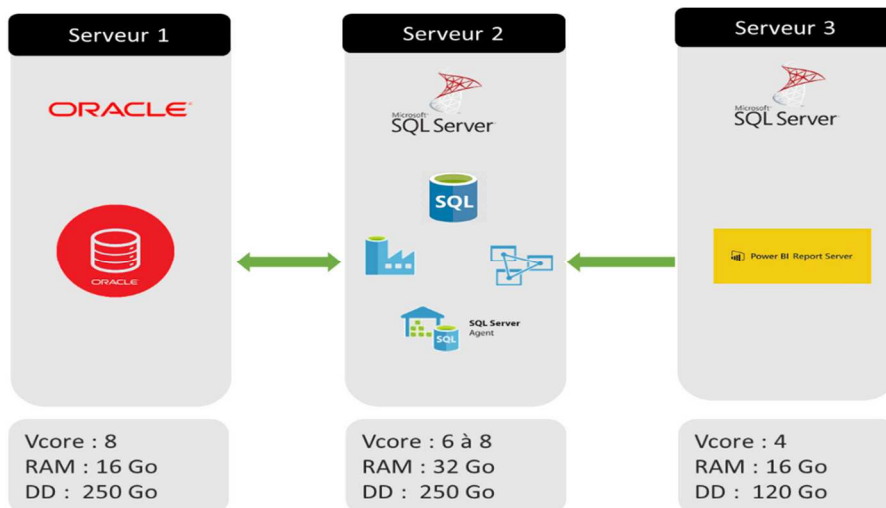
SERVER	OS	RAM	CPU	STORAGE	Services
Server 1	Linux 7	16 GB	8 Vcores	250	Oracle RDBMS: STG/DWH
Server 2	Windows 2019	32 GB	6 to 8 Vcores	250 GB	SQL SERVER RDBMS: SSIS and RS catalog SSIS: ETL SSAS Tabular: Tabular cube SQL Agent : Scheduler
Server 3	Windows 2019	16 GB	4 Vcores	250	Power BI Report Server: Data Visualisation

## 6   SECURITY & AUTHENTICATION

6.1   ETL AND CUBE

Access to the ETL server, SSIS and Cube packages is restricted to platform administrators and developers.

6.2   ODS AND DWH

As mentioned in section "3.2 TECHNICAL ARCHITECTURE OVERVIEW", we recommend starting with a centralized DWH. In this case, access will only be granted to administrator and developer profiles.

The first thing to do before starting to develop SSIS packages is to configure the connections to the various data sources we're going to use. This is done in the connection manager tab.
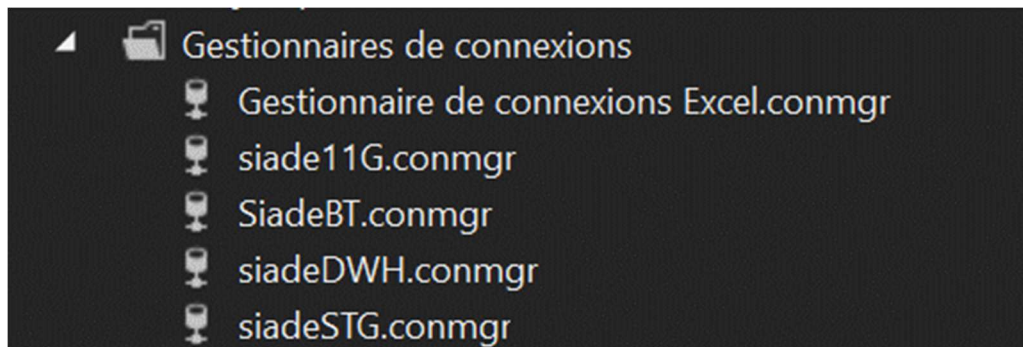
Parameters were used to facilitate deployment of the project and SSIS packages (transition from a development environment to a production environment).

For this project, 4 connections had to be created:

- A connection to the SIADE database
- A connection to the SBT base
- An ODS connection

- A connection for DWH

Once the connections have been established, we can start developing the SSIS flows. Using ETL, we first integrated the data into the ODS (Operational Data Store) and then into our DWH.
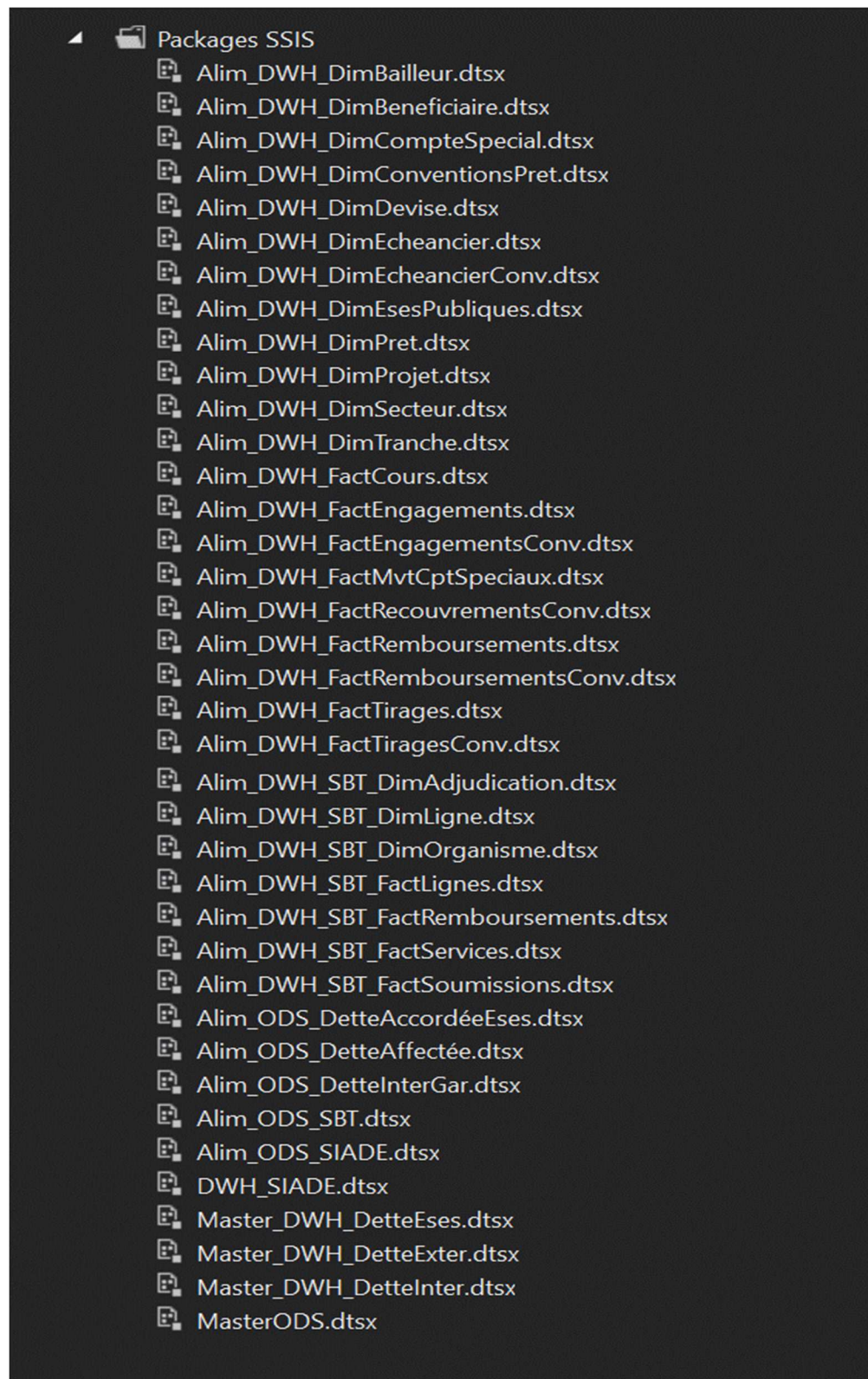
In what follows, we'll look at a few examples of source tables and their correspondence after transformation in the DWH (source data comes mainly from the SIADE database).

Source table	Table name	
	ODS	**DWH**
NPRET	**SiadeODS_Pret**	**SiadeDWH_DimPret**
NACCORD	**SiadeODS_Accord**	**SiadeDWH_DimPret**
NDEBOURS	**SiadeODS_Tirage**	**SiadeDWH_FactTirage**
NECHEANCIER	**SiadeODS_Schedule**	**SiadeDWH_FactEcheanciers**
NREMBOURS	**SiadeODS_Echeance**	**SiadeDWH_FactRemboursement**
DE_PAYS	**SiadeODS_Pays**	**SiadeDWH_DimBeneficiares**
DE_DEVISE	**SiadeODS_Devise**	**SiadeDWH_DimDevises**
DE_SECTOR	**SiadeODS_Sector**	**SiadeDWH_DimSecteur**
DE_PRETEUR	**SiadeODS_Prector**	**SiadeDWH_DimBeneficiaries**

A mapping file will be supplied with this document, containing the complete list of tables and mapping details for the ODS and DWH tables. In the ETL, flows are implemented to load data from the SIADE and SBT databases to the DWH.

The following figure illustrates the SSIS packages developed for loading ODS and DWH tables.

```
▲   📁 Packages SSIS
        📄 Alim_DWH_DimBailleur.dtsx
        📄 Alim_DWH_DimBeneficiaire.dtsx
        📄 Alim_DWH_DimCompteSpecial.dtsx
        📄 Alim_DWH_DimConventionsPret.dtsx
        📄 Alim_DWH_DimDevise.dtsx
        📄 Alim_DWH_DimEcheancier.dtsx
        📄 Alim_DWH_DimEcheancierConv.dtsx
        📄 Alim_DWH_DimEsesPubliques.dtsx
        📄 Alim_DWH_DimPret.dtsx
        📄 Alim_DWH_DimProjet.dtsx
        📄 Alim_DWH_DimSecteur.dtsx
        📄 Alim_DWH_DimTranche.dtsx
        📄 Alim_DWH_FactCours.dtsx
        📄 Alim_DWH_FactEngagements.dtsx
        📄 Alim_DWH_FactEngagementsConv.dtsx
        📄 Alim_DWH_FactMvtCptSpeciaux.dtsx
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        📄 Alim_DWH_FactRemboursements.dtsx
        📄 Alim_DWH_FactRemboursementsConv.dtsx
        📄 Alim_DWH_FactTirages.dtsx
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        📄 Alim_DWH_SBT_DimOrganisme.dtsx
        📄 Alim_DWH_SBT_FactLignes.dtsx
        📄 Alim_DWH_SBT_FactRemboursements.dtsx
        📄 Alim_DWH_SBT_FactServices.dtsx
        📄 Alim_DWH_SBT_FactSoumissions.dtsx
        📄 Alim_ODS_DetteAccordéeEses.dtsx
        📄 Alim_ODS_DetteAffectée.dtsx
        📄 Alim_ODS_DetteInterGar.dtsx
        📄 Alim_ODS_SBT.dtsx
        📄 Alim_ODS_SIADE.dtsx
        📄 DWH_SIADE.dtsx
        📄 Master_DWH_DetteEses.dtsx
        📄 Master_DWH_DetteExter.dtsx
        📄 Master_DWH_DetteInter.dtsx
        📄 MasterODS.dtsx
```

6.2.1   PIPELINE MASTER ODS

The Master pipeline contains all loading flows from the source database to the ODS.
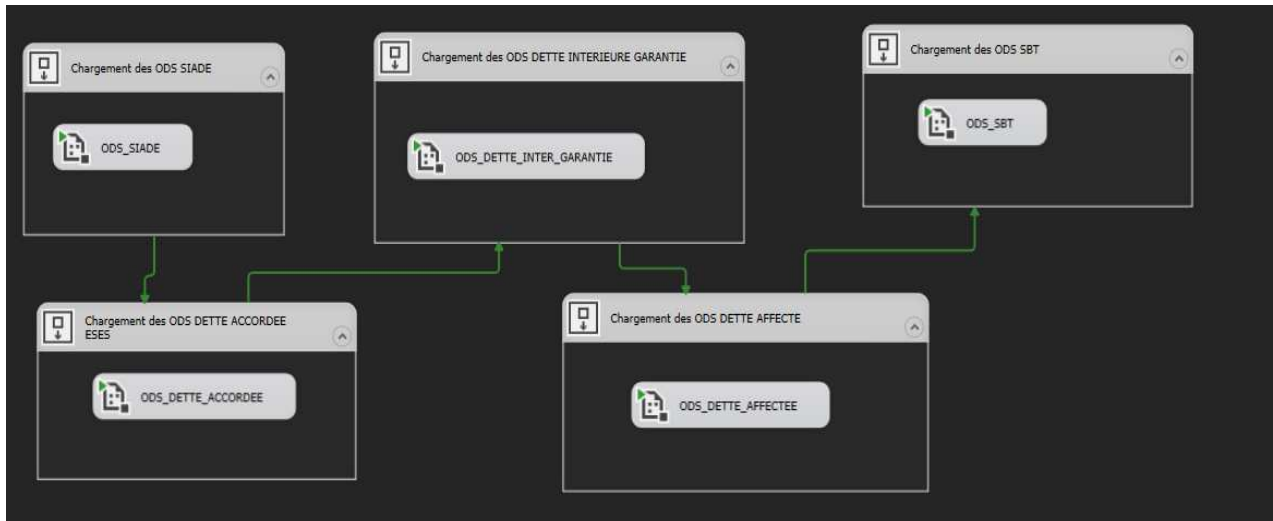
The Master DWH pipeline contains the data loading flows from the ODS to the DWH after the various transformation stages.
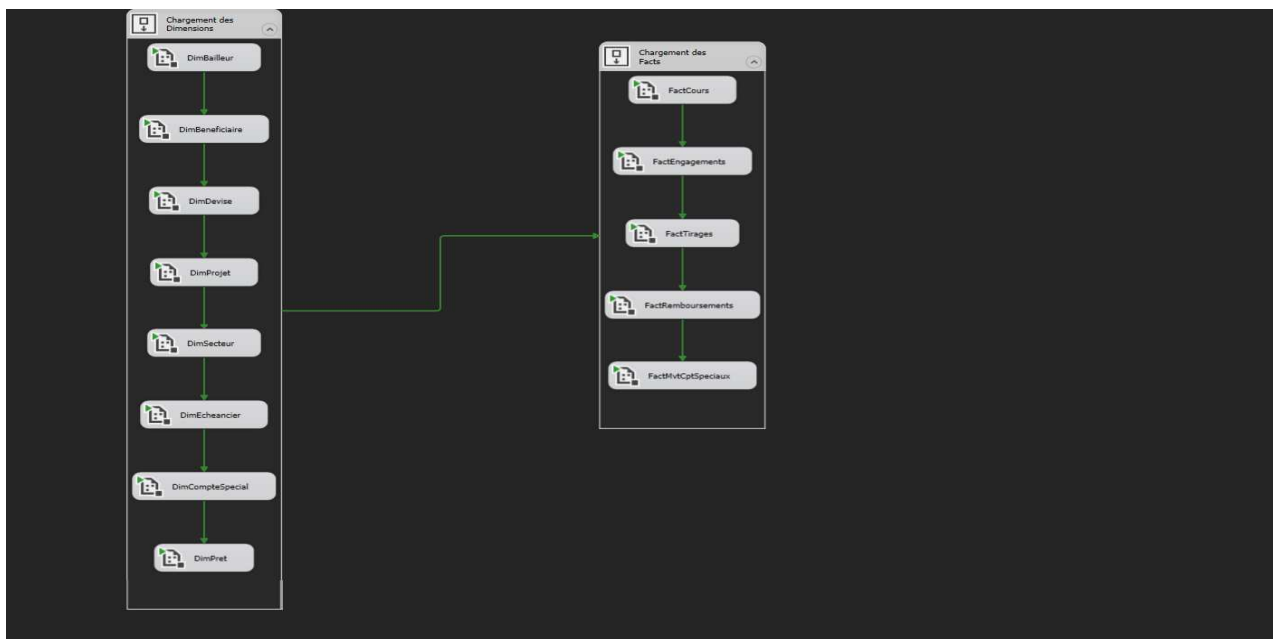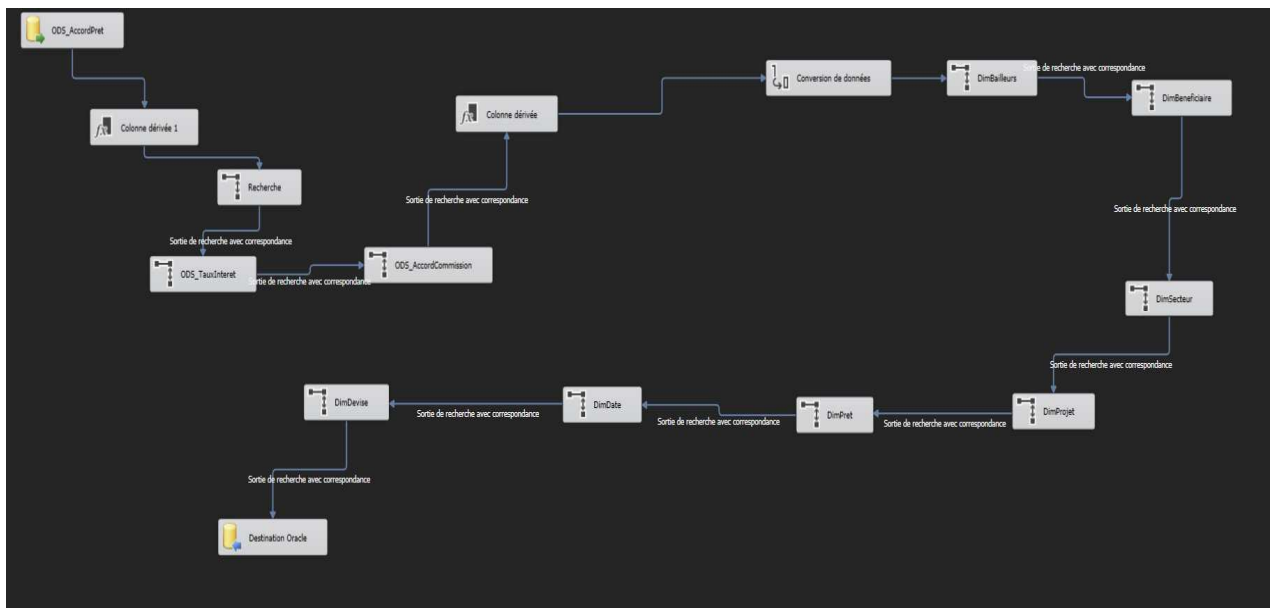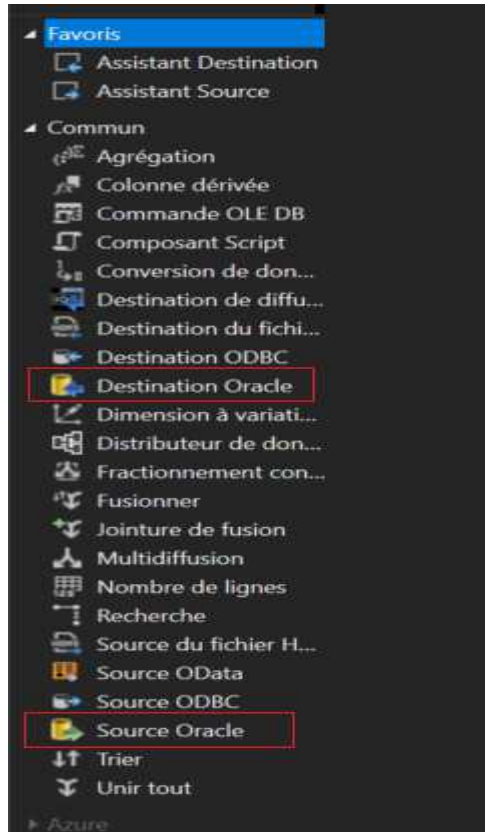

Below is an ETL printout of the Alim_DWH_FactEngagement.dtsx package, illustrating the loading of Fact_Engagement. The various transformation components are used in the data flow section.

The following components are used in this example:

- Source Oracle
- Derived column

- Search

- Data conversion

- Destination Oracle

Derived Columns components are used to perform transformations at the level of column names, or transformations according to business rules for KPI calculation. (If else , > , < , =!, etc ...)

Search components (LOOKUP) are used to search for rows with dimension primary keys and then insert foreign keys in the fact table.

Data conversion components are used to convert column data types (e.g. integer type converted to date type).

Thus, the data model of the external debt domain translates as follows:
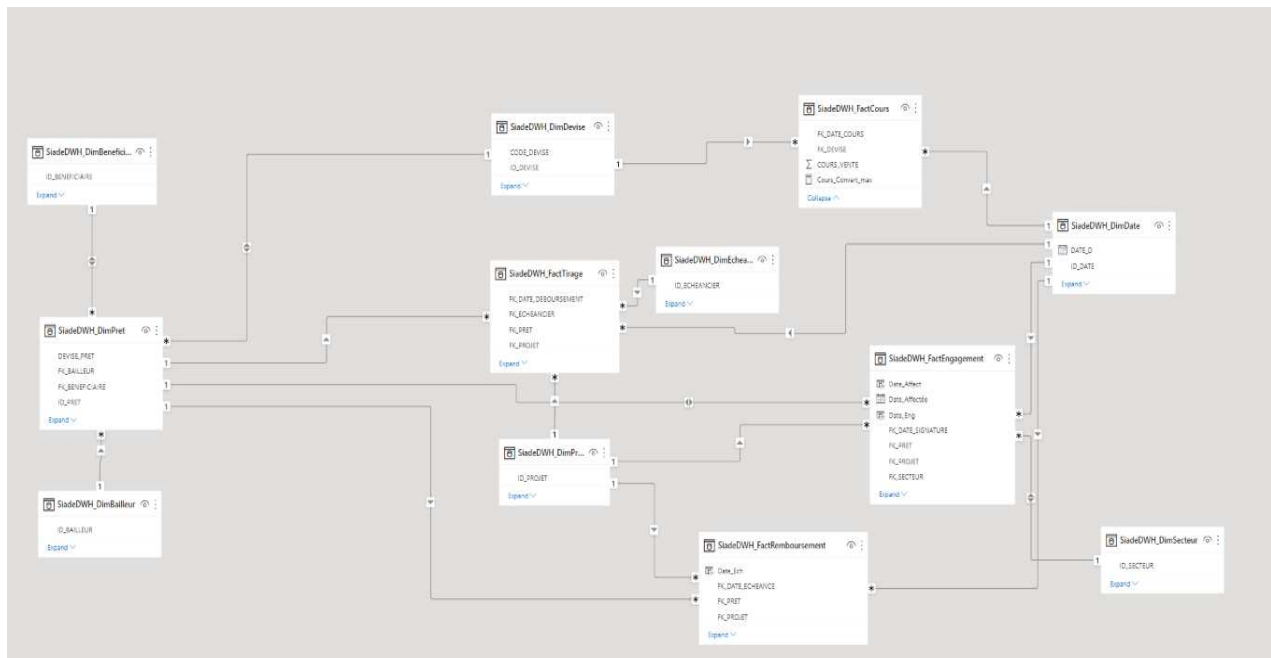
Table of facts :
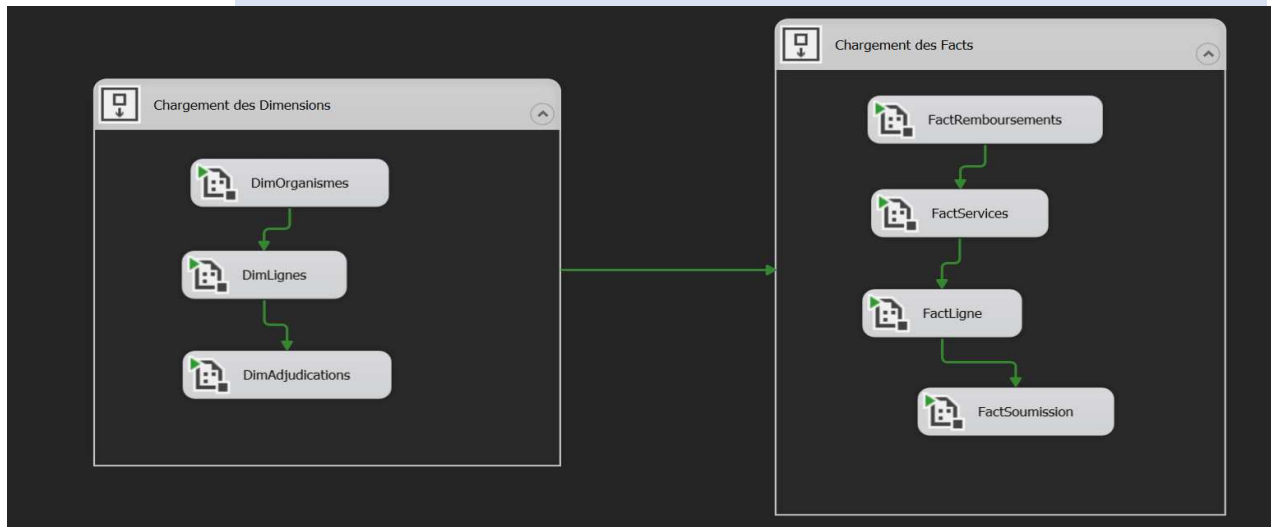
- Fact Engagement
- Fact Tirage
- Invoice Refund
- Fact Cours

Dimension table :

- Dim loan
- Dim currency
- Dim date
- Dim lessor

- Dim beneficiary

- Dim sector

- Dim project

- Dim Schedule

6.2.3   DWH MASTER PIPELINE OF DOMESTIC DEBT

For greater clarity, we have chosen to create a specific package for domestic debt.

The Master_DWH_DetteInter.dtsx package contains the loading of dimensions and fact tables for the domestic debt domain.

7   POWER BI - AUTHENTICATION

Power BI reports are published on the Report Server, which is accessible from the CIMF internal network.
To access them, Users have been created with their corresponding passwords.
Reports are published in the same Workspace, but access is managed at report level.
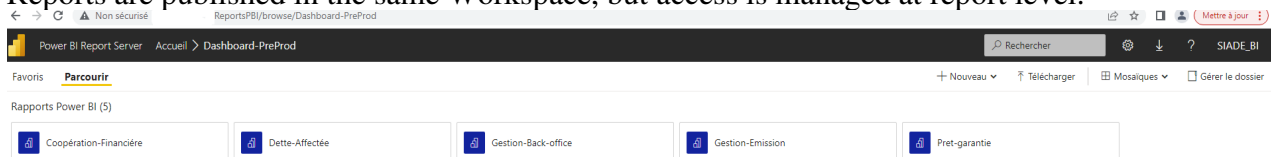
8   BACKUP/RESTORE PROCEDURE

8.1 DATA BACKUP SERVER

Backup and Restore strategy to be defined at a later date.

10.2   Attachment B: Proposal Cover Letter

[On Firm's Letterhead]

<Insert date>

TO: Click here to enter text.

Development Alternatives, Inc.

We, the undersigned, provide the attached proposal in accordance with **RFP-**Click here to enter text.**-**Click here to enter text. issued on Click here to enter text.. Our attached proposal is for the total price of <Sum in Words ($0.00 Sum in Figures) >.

I certify a validity period of Click here to enter text. days for the prices provided in the attached Price Schedule/Bill of Quantities. Our proposal shall be binding upon us subject to the modifications resulting from any discussions.

Offeror shall verify here the items specified in this RFP document.

We understand that DAI is not bound to accept any proposal it receives.

Yours sincerely,

Authorized Signature:

Name and Title of Signatory: Click here to enter text.

Name of Firm: Click here to enter text.

Address: Click here to enter text.

Telephone: Click here to enter text.

Email: Click here to enter text.

Company Seal/Stamp:

10.3   Attachment C: Price Schedule

Item Number	Item Name	Description/Specifications	Quantity	Unit Price	Total Price
A1	Month 1 Deliverables • L1: Project plan from proposal updated. • L2: Draft functional specifications prepared • L3: Monthly project report			10% of total	
A2	Month 2 Deliverables • L4: Project plan updated based on final functional specifications • L5: Final functional specifications prepared • L6: Draft of data model and ETL schema • L7: Initial ETL scripts and data warehouse structures • L8: Initial KPIs (up to 50 per functional specifications) • L9: Monthly project report			10% of total	
A3	Month 3 Deliverables • L10: Updated data model • L11: Updated ETL scripts and data warehouse structures • L12: Updated KPIs per functional requirements • L13: Draft dashboards (up to 4			10% of total	

	per functional specifications) • L14: Monthly project report				
A4	Month 4 Deliverables • L15: Updated data model • L16: Updated ETL scripts and data warehouse structures • L17: Updated KPIs • L18: Updated dashboards • L19: Draft multidimensional report data structures and interfaces • L20: Monthly project report			10% of total	
A5	Month 5 Deliverables • L21: Updated data model • L22: Updated ETL scripts and data warehouse structures • L23: Updated KPIs • L24: Updated dashboards • L25: Updated multidimensional report data structures and interfaces • L26: Monthly project report			10% of total	
A6	Month 6 – Deliverables for Deployment • L27: Final data model			30% of total	

	• L28: Successful testing of KPIs and dashboards • L29: Successful testing of multidimensional report interfaces • L30: Updated source code for ETLs, data warehouse, KPIs and dashboards • L31: Updated multidimensional report data structures and interfaces • L32: Monthly project report (Acceptance of deliverables requires satisfactory user acceptance testing and stable software.)				
A7	Month 7 Deliverables • L33: Completed implementation and integration • L34: Completed training materials • L35: Delivered training sessions • L36: Final source coded deployed and in full operation • L37: Monthly report			5% of total	
A8	Month 8 Deliverables • L38: Maintenance and support • L39: Updated sourced coded (if there are changes) L40: Monthly report			5% of total	
A9	Month 9 Deliverables • L41: Maintenance and support			5% of total	

	• L42: Updated sourced coded (if there are changes) L43: Monthly report				
A10	Month 10 Deliverables • L44: Maintenance and support • L45: Updated sourced coded (if there are changes) • L46: Monthly report			5% of total	
GRAND TOTAL IN Click here to enter text.					
GRAND TOTAL IN UNITED STATES DOLLARS					$

Delivery Period: Click here to enter text.

10.6   Attachment F: Past Performance Form

Include projects that best illustrate your work experience relevant to this RFP, sorted by decreasing order of completion date.

Projects should have been undertaken in the past three years. Projects undertaken in the past six years may be taken into consideration at the discretion of the evaluation committee.

#	Project Title	Description of Activities	Location Province/ District	Client Name/Tel No	Cost in US$	Start-End Dates	Completed on schedule (Yes/No)	Completion Letter Received? (Yes/No)	Type of Agreement, Subcontract, Grant, PO (fixed price, cost reimbursable)
1									
2									
3									
4									
5									

10.7 Attachment G: Representations and Certifications of Compliance

1. Federal Excluded Parties List - The Bidder Select is not presently debarred, suspended, or determined ineligible for an award of a contract by any Federal agency.

2. Executive Compensation Certification- FAR 52.204-10 requires DAI, as prime contractor of U.S. federal government contracts, to report compensation levels of the five most highly compensated subcontractor executives to the Federal Funding Accountability and Transparency Act Sub-Award Report System (FSRS)

3. Executive Order on Terrorism Financing- The Contractor is reminded that U.S. Executive Orders and U.S. law prohibits transactions with, and the provision of resources and support to, individuals and organizations associated with terrorism. It is the legal responsibility of the Contractor/Recipient to ensure compliance with these Executive Orders and laws. Recipients may not engage with, or provide resources or support to, individuals and organizations associated with terrorism. No support or resources may be provided to individuals or entities that appear on the Specially Designated Nationals and Blocked persons List maintained by the US Treasury (online at www.SAM.gov) or the United Nations Security Designation List (online at: http://www.un.org/sc/committees/1267/aq_sanctions_list.shtml). This provision must be included in all subcontracts/sub awards issued under this Contract.

4. Trafficking of Persons – The Contractor may not traffic in persons (as defined in the Protocol to Prevent, Suppress, and Punish Trafficking of persons, especially Women and Children, supplementing the UN Convention against Transnational Organized Crime), procure commercial sex, and use forced labor during the period of this award.

5. Certification and Disclosure Regarding Payment to Influence Certain Federal Transactions – The Bidder certifies that it currently is and will remain in compliance with FAR 52.203-11, Certification and Disclosure Regarding Payment to Influence Certain Federal Transactions.

6. Organizational Conflict of Interest – The Bidder certifies that will comply FAR Part 9.5, Organizational Conflict of Interest. The Bidder certifies that is not aware of any information bearing on the existence of any potential organizational conflict of interest. The Bidder further certifies that if the Bidder becomes aware of information bearing on whether a potential conflict may exist, that Bidder shall immediately provide DAII with a disclosure statement describing this information.

7. Prohibition of Segregated Facilities - The Bidder certifies that it is compliant with FAR 52.222-21, Prohibition of Segregated Facilities.

8. Equal Opportunity – The Bidder certifies that it does not discriminate against any employee or applicant for employment because of age, sex, religion, handicap, race, creed, color or national origin.

9. Labor Laws – The Bidder certifies that it is in compliance with all labor laws.

10. Federal Acquisition Regulation (FAR) – The Bidder certifies that it is familiar with the Federal Acquisition Regulation (FAR) and is in not in violation of any certifications required in the applicable clauses of the FAR, including but not limited to certifications regarding lobbying, kickbacks, equal employment opportunity, affirmation action, and payments to influence Federal transactions.

11. Employee Compliance – The Bidder warrants that it will require all employees, entities and individuals providing services in connection with the performance of an DAI Purchase Order to comply with the provisions of the resulting Purchase Order and with all Federal, State, and local laws and regulations in connection with the work associated therein.

By submitting a proposal, offerors agree to fully comply with the terms and conditions above and all applicable U.S. federal government clauses included herein, and will be asked to sign these Representations and Certifications upon award.

10.8 Attachment H: Branding and Marking Plan

Note: This is not required as part of the proposal. It is included as information for the Offeror. Upon subcontract award, this will be the first deliverable due.

Appendix N: Marking Plan

Sub Project Number and Name:_____

Name of Implementing Partner:_____

Name and Title of Partner's Agent:_____

Name and Title of DAI Project Manager:_____

Instructions: This form has been created to provide implementing partners (subcontractors and grantees) and DAI Project Managers with a summary of marking requirements found in the Project's Branding Implementation Plan (BIP). This form must be completed by the DAI Project Manager in conjunction with the agent of the implementing partner. Once completed, the Project Manager must upload the form to TAMIS.

Subproject Activities

> Provide a short summary of the activities to be completed including the project location. For example, what materials or equipment will be purchased? What events will take place?

Include 2-3 sentence summary here:

> Please place an "X" below for each activity that will take place as part of this Sub project. The implementing partner will be responsible for ensuring the Marking noted in the table below is implemented according to standards and templates provided.

Mark "X"	Activity/Documents	Required Marking
Activities		

Mark "X"	Activity/Documents	Required Marking
Documents		
	Reports	
	Certificates (training or other)	
	Invitations	
	Other (please describe)	

Co- Branding and Co-Marking:

DAI logo must not appear on any USAID funded programmatic material.

Requests for Exceptions or Waivers of Marking Requirements – If you do not feel it is possible to mark one or more of the items or events listed above, please describe below (1) what marking you want to be exempt from (2) how the activity or item meets the requirement for an exception or waiver.

Include full detailed justification here:

10.9 Attachment I: Full Terms of Contract

10.10 Attachment J: Proposal Checklist

Offeror: _____

Have you?

☐ Submitted your proposal to DAI in a sealed envelope to the address (electronic or mailing) as specified in General Instructions above?

Does your proposal include the following?

☐ Signed Cover Letter *(use template in Attachment B)*

☐ Separate Technical and Cost proposals individually sealed and labeled as Volume I and Volume II respectfully.

☐ Proposal of the Product or Service that meets the technical requirements as per Attachment A

☐ Response to each of the evaluation criteria

☐ Documents use to determine Responsibility

☐ Evidence of an Unique Entity ID (SAM)OR Self Certification for Exemption from Unique Entity ID (SAM)Requirement

☐ Past Performance *(use template in Attachment F)*

☐

☐