

GSS19733-ONBASE
APPENDIX B - TECHNICAL STANDARDS AND SECURITY REQUIREMENTS

Appendix B is included with this RFP and provides bidders with an opportunity to review, acknowledge, and agree to all Technical Standards and Security Requirements.

Attachments include:

- Delaware Cloud Services Terms and Conditions (2 pages)
- Confidentiality and Integrity of Data Statement (1 page)
- Network Diagram Template (1 page)
- Software Inventory (1 page)
- Data Dictionary or Data Model (4 pages)
- Data Model Samples (16 pages)



STATE OF DELAWARE
 DEPARTMENT OF TECHNOLOGY AND INFORMATION
 801 Silver Lake Blvd., Dover, Delaware 19904

DELAWARE CLOUD SERVICES TERMS AND CONDITIONS AGREEMENT

PUBLIC AND NON-PUBLIC DATA OWNED BY THE STATE OF DELAWARE

XaaS Contract # _____, Appendix _____
 between State of Delaware and _____ dated _____

	Public Data	Non Public Data	Cloud Services (CS) Terms
			<p>PROVIDER must satisfy Clause CS1-A OR Clauses CS1-B and CS1-C, AND Clause CS4 for all engagements involving non-public data.</p> <p>Clause CS2 is mandatory for all engagements involving non-public data.</p> <p>Clause CS3 is only mandatory for SaaS or PaaS engagements involving non-public data.</p>
CS1-A		✓	<p>Security Standard Compliance Certifications: The PROVIDER shall meet, and provide proof of, one or more of the following Security Certifications.</p> <ul style="list-style-type: none"> • CSA STAR – Cloud Security Alliance – Security, Trust & Assurance Registry (Level Two or higher) • FedRAMP - Federal Risk and Authorization Management Program
CS1-B		✓	<p>Background Checks: The PROVIDER must warrant that they will only assign employees and subcontractors who have passed a state-approved criminal background checks. The background checks must demonstrate that staff, including subcontractors, utilized to fulfill the obligations of the contract, have no convictions, pending criminal charges, or civil suits related to any crime of dishonesty. This includes but is not limited to criminal fraud, or any conviction for any felony or misdemeanor offense for which incarceration for a minimum of 1 year is an authorized penalty. The PROVIDER shall promote and maintain an awareness of the importance of securing the State's information among the Service Provider's employees and agents. Failure to obtain and maintain all required criminal history may be deemed a material breach of the contract and grounds for immediate termination and denial of further work with the State of Delaware.</p>
CS1-C		✓	<p>Sub-contractor Flowdown: The PROVIDER shall be responsible for ensuring its subcontractors' compliance with the security requirements stated herein.</p>
CS2		✓	<p>Breach Notification and Recovery: The PROVIDER must notify the State of Delaware immediately of any incident resulting in the destruction, loss, unauthorized disclosure, or alteration of State of Delaware data. If data is not encrypted (see CS3, below), Delaware Code (6 Del. C. §12B-100 et seq.) requires public breach notification of any incident resulting in the loss or unauthorized disclosure of Delawareans' Personally Identifiable Information (PII, as defined in Delaware's <i>Terms and Conditions Governing Cloud Services</i> policy) by PROVIDER or its subcontractors. The PROVIDER will provide notification to persons whose information was breached without unreasonable delay but not later than 60 days after determination of the breach, except 1) when a shorter time is required under federal law; 2) when law enforcement requests a delay; 3) reasonable diligence did not identify certain residents, in which case notice will be delivered as soon as practicable. All such communication shall be coordinated with the State of Delaware. Should the PROVIDER or its contractors be liable for the breach, the PROVIDER shall bear all costs associated with investigation, response, and recovery from the breach. This includes, but is not limited to, credit monitoring services with a term of at least three (3) years, mailing costs, website, and toll-free telephone call center services. The State of Delaware shall not agree to any limitation on liability that relieves the PROVIDER or its subcontractors from its own negligence, or to the extent that it creates an obligation on the part of the State to hold a PROVIDER harmless.</p>



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			PROVIDER must satisfy Clause CS1-A OR Clauses CS1-B and CS1-C, AND Clause CS4 for all engagements involving non-public data. Clause CS2 is mandatory for all engagements involving non-public data. Clause CS3 is only mandatory for SaaS or PaaS engagements involving non-public data.
CS3		✓	Data Encryption: The PROVIDER shall encrypt all non-public data in transit, regardless of transit mechanism. For engagements where the PROVIDER stores Personally Identifiable Information (PII) or other sensitive, confidential information, it shall encrypt this non-public data at rest. The PROVIDER’s encryption shall meet validated cryptography standards as specified by the National Institute of Standards and Technology in FIPS140-2 and subsequent security requirements guidelines. The PROVIDER and State of Delaware will negotiate mutually acceptable key location and key management details. Should the PROVIDER not be able to provide encryption at rest, it must maintain cyber security liability insurance coverage for the duration of the contract. Coverage must meet the State of Delaware’s standard in accordance with the <i>Terms and Conditions Governing Cloud Services</i> policy.
CS4	✓	✓	Notification of Legal Requests: The PROVIDER shall contact the State of Delaware upon receipt of any electronic discovery, litigation holds, discovery searches, and expert testimonies related to, or which in any way might reasonably require access to the data of the State. With regard to State of Delaware data and processes, the PROVIDER shall not respond to subpoenas, service of process, and other legal requests without first notifying the State unless prohibited by law from providing such notice.

The terms of this Agreement shall be incorporated into the aforementioned contract. Any conflict between this Agreement and the aforementioned contract shall be resolved by giving priority to this Agreement. By signing this Agreement, the PROVIDER agrees to abide by the following applicable Terms and Conditions :

FOR OFFICIAL **CS4 (Public Data)**
 USE ONLY **CS1-A and CS4 (Non-Public Data) OR** **CS1-B and CS1-C and CS4 (Non-Public Data)**
 CS2 (Non-public Data) **CS3 (SaaS, PaaS – Non-public Data)**

PROVIDER Name/Address (print): _____

PROVIDER Authorizing Official Name (print): _____

PROVIDER Authorizing Official Signature: _____ Date: _____



DEPARTMENT OF TECHNOLOGY AND INFORMATION

William Penn Building
801 Silver Lake Boulevard
Dover, Delaware 19904-2407

CONFIDENTIALITY (NON-DISCLOSURE) AND INTEGRITY OF DATA AGREEMENT

The Department of Technology and Information is responsible for safeguarding the confidentiality and integrity of data in State computer files regardless of the source of those data or medium on which they are stored; e.g., electronic data, computer output microfilm (COM), tape, or disk. Computer programs developed to process State Agency data will not be modified without the knowledge and written authorization of the Department of Technology and Information. All data generated from the original source data, shall be the property of the State of Delaware. The control of the disclosure of those data shall be retained by the State of Delaware and the Department of Technology and Information.

I/we, as an employee(s) of _____ or officer of my firm, when performing work for the Department of Technology and Information, understand that I/we act as an extension of DTI and therefore I/we are responsible for safeguarding the States' data and computer files as indicated above. I/we will not use, disclose, or modify State data or State computer files without the written knowledge and written authorization of DTI. Furthermore, I/we understand that I/we are to take all necessary precautions to prevent unauthorized use, disclosure, or modification of State computer files, and I/we should alert my immediate supervisor of any situation which might result in, or create the appearance of, unauthorized use, disclosure or modification of State data.

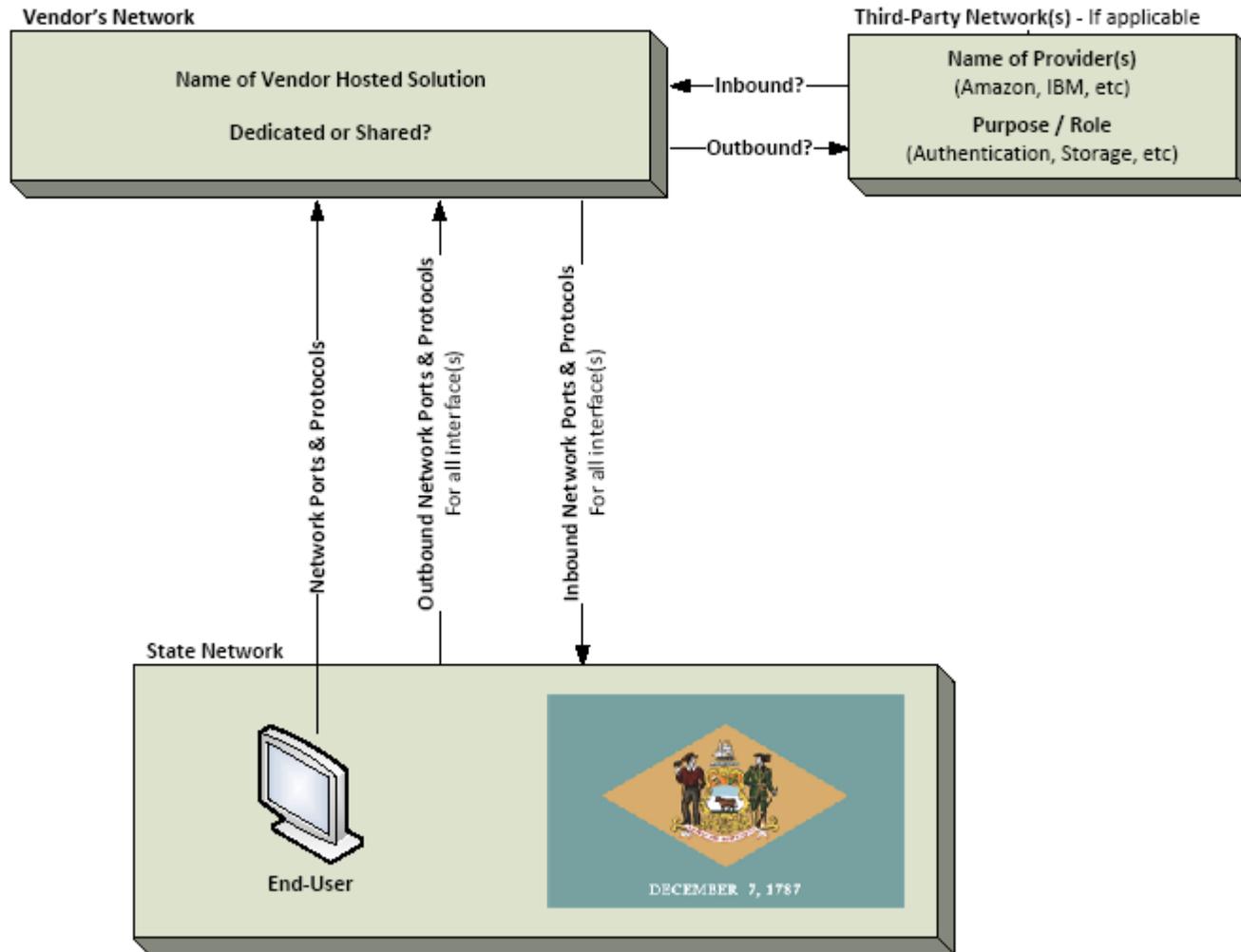
Penalty for unauthorized use, unauthorized modification of data files, or disclosure of any confidential information may mean the loss of my position and benefits, and prosecution under applicable State or Federal law.

This statement applies to the undersigned Contractor and to any others working under the Contractor's direction.

I, the Undersigned, hereby affirm that I have read DTI's Policy on Confidentiality (Non-Disclosure) and Integrity of Data and understood the terms of the above Confidentiality (Non-Disclosure) and Integrity of Data Agreement, and that I/we agree to abide by the terms above.

Contractor Signature _____
Title: _____
Date: _____
Contractor Name: _____

Network Diagram Template For Hosted / Outsourced Solutions



Requirements for Submission of a Data Dictionary or Data Model

This document is also available at the following URL:
<http://dti.delaware.gov/pdfs/pp/RFPRequirementsforSubmissionofaDataDictionaryorDataModel.pdf>

The State of Delaware Data Governance Council was established in January 2012 to put a greater focus on the management and governance of data within the state. The state recognizes that data is an enterprise asset that can be leveraged and managed to allow the state government to operate more efficiently and effectively. In order to achieve this, a clear understanding must be obtained of all of the data owned by the state. Therefore, a data dictionary or data model must be submitted for all applications developed, procured, or utilized by the state.

At a minimum, a data dictionary OR a conceptual data model for state-owned business data must be submitted for the project approval process. The data dictionary or conceptual data model does not have to be submitted with a vendor response to an RFP, but must be submitted once the design of the solution is complete or prior to implementation of the solution. The submitted data dictionary or conceptual data model must adhere to the below requirements.

The data dictionary or data model must include at least the following items:

- **Entity names and descriptions**
- **Entity relationships and descriptions**
- **Attribute names, descriptions, data type, and length**
- **Primary identifier for each entity**

The data dictionary must be submitted in Excel or in a .csv file. The directions for how to format the Excel workbook is explained in the first section of the [Data Model Samples document](#). If a data model is submitted, it must be in either Sybase PowerDesigner or CA ERwin format.

To protect the proprietary information of vendor solutions the information submitted only needs to contain the core objects that house state-owned business data. Examples of core state-owned business data are citizen, address, company, etc. The submitted data dictionary or conceptual data model does not need to include objects for the data that is not owned by the state. Examples of non-state data are the objects that exist to maintain the database or control the inner workings of the application. To further protect the proprietary information about the database, the data dictionary or conceptual data model is not expected to have the actual physical object names.

The data models/dictionaries are stored in a secure repository where only the agency who is the steward of the data, the DTI Data Management Team, and the Data Governance Council can access the information for purposes of data governance. The data models/dictionaries will only be shared with others if approved by the data steward.

Following is more information regarding the preparation of a data dictionary or a data model for submission.

Data Dictionary Overview

A data dictionary contains information about the components of a data repository. The components are the tables, attributes, and their relationships. The details of each include:

- Descriptions for tables (also known as entities), attributes (also known as columns), and relationships.
- The attributes that make up a table.

- The format and length of attributes.
- Indicates if the attribute is a key identifier to the table.
- The type of relationship between the tables.

The data dictionary can be submitted as an Excel workbook or in multiple .csv files. The .csv files will need to be individual files where the following directions indicate a worksheet within an Excel workbook. The .csv files need to be comma delimited with text in quotes.

For examples, please see the [Data Model Samples - Section A](#).

Data Modeling Overview

A database is a repository of information, a house of data. The data model is to the database what blue prints are to a house. The data architect performs similar functions as the building architect working with clients to define needs and usage. Data models are key for understanding the data a business uses, how it is organized, how it is governed, how the data can be shared, and how the data is housed.

A data model is more than just a diagram portraying tables and columns. The data model:

- Defines the tables in the database.
- How the tables will be connected (relationships).
- What data elements (columns) are in each table.
- The format and size of each attribute.
- The key attribute (usually the unique identifier) for each table. The columns are also known as attributes because they are describing something about the table.
- There are definitions for the model, tables, attributes, and relationships.

All of this information is pertinent to understanding the data and is required in the data model. Additional information that is helpful but not necessary is the data classification, the data steward name (this could be an individual or group), and rules that govern the sharing of the data.

Data models range from small simplistic views of a business to extensive in depth physical implementations. There are three types of data models each building from the other. The first is the conceptual model which organizes the way a business uses its data. Next is the logical model which expands on the conceptual to begin modifying the structure to the requirements of an application. Both the conceptual and logical models are technology independent. The third model is the physical model which is the actual implementation of the data objects designed for performance and based upon a specific technology.

Below are further explanations for each type of data model and some of the types of changes that occur between the models. Though it is typical to start with the conceptual and work through to the physical, you can start with any of the model types and then create the other types of models.

Conceptual Data Model

The Conceptual Data Model describes data requirements from a business point of view without the burden of technical details. Models at this level are about understanding the data requirements of the business.

The conceptual model is started by documenting the main entities or subject areas. Then identify how they relate based upon business rules and processes. You add the attributes which sometimes causes changes in the relationships or the defining of more entities. Lastly you indicate the identifying attribute(s) which creates the uniqueness of a record within an entity. As you create the model you should be documenting the definitions of the tables, relationships, and attributes. This is the early stages so you may not know all of what is to be captured. This is a starting point to know what base attributes are needed.

Conceptual models are independent of technology. They can be used where understanding the data used by a business is needed. They do not need to be drawn just for relational databases. They can be built for non-relational systems like ADABAS and Lotus Notes to better understand what data the business uses and how it uses it.

Documenting the subject areas, their relationships, the data elements, and key identifiers are beneficial even at the RFP stage. The conceptual data model can be used to evaluate if a vendor's product can meet your business needs for data or help determine if you need to change how you use your data.

For a sample conceptual model, please see the [Data Model Samples - Section B.](#)

Logical Data Model

The Logical Data Model refines the conceptual model by modifying the entities, their attributes and their relationships in consideration of an application design. These models are technology independent.

The logical model builds on the conceptual model. Primary and foreign keys are generated for each table. The primary key guarantees the uniqueness of a record. The foreign key creates the relationship between two tables. The conceptual tables are normalized to:

- Eliminate redundancies in the database so that data is captured only once.
- A single compound attribute (such as name) will be expanded to individual columns (such as first name, middle name, last name).
- Verify that every attribute in a record has a direct relation to the primary key for that table and not to another table.

For a sample logical model, please see the [Data Model Samples - Section C.](#)

Physical Data Model

The Physical Data Model represents the detailed specification of what is physically implemented using specific technology. Physical design considerations include performance, size and growth, availability, recovery from failure, and use of specific technology features.

The physical data model is tied to technology. When it is generated you select the type of database. The code generated is specific to the database type.

The physical data model includes objects to manage the data or improve database performance. This may include user views, alternate table indexes, table partitioning, business rules applied to attributes, triggers, stored procedures, and security.

For a sample logical model, please see the [Data Model Samples - Section D](#).



Data Model Samples

The document is separated into two sections – Data Dictionary and Data Models. When submitting a data model, you only need to submit one of the types of models, not all three. Please review the part of this document for the type of submission you will be making for project approval. The samples used are based upon a data repository for human resources.

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Section A - Sample Data Dictionary

Each worksheet within the workbook pertains to an object in the data repository. There are three worksheets required. The names of the worksheets and the column headings in each worksheet must match the examples.

1. Entity – This is a list of the tables in the data repository. Each table will be a separate row in the worksheet. The required information in the worksheet is the:
 - a. Name – The name of the table.
 - b. Comment – The description of the purpose of the table.
2. Attribute – This is a list of the columns that are contained within each table. Each column will be a separate row in the worksheet. All columns for all tables will be in one worksheet. The required information in the worksheet is the:
 - a. Name – The name of the attribute.
 - b. Entity – The name of the table containing the attribute.
 - c. Comment – The description of the purpose of the table.
 - d. Data Type – The format of the data (i.e. – numeric, integer, date, etc.)
 - e. Length – The size of the attribute.
 - f. Mandatory – If the attribute is a required element to the table then enter “TRUE”. Otherwise, leave this value blank.
 - g. Primary Identifier – If the attribute is key to the identification of the information in the table then enter “TRUE”. Otherwise, leave this value blank.
3. Relationship – This is a list of the links between the tables. Each relationship will be a separate row in the worksheet. All relationships between all tables will be in one worksheet. The required information in the worksheet is the:
 - a. Name – The name of the relationship.
 - b. Comment – The description of the relationship between the two tables.
 - c. First Entity – The name one of the tables linked in the relationship. This is typically the parent or dominant table in the relationship.
 - d. Second Entity – The name one of the tables linked in the relationship. This is typically the name of the child table in the relationship.
 - e. Entity 1 -> Entity 2 Role Mandatory – If the “First Entity” is required in the relationship then enter “TRUE”. Otherwise, leave this value blank.
 - f. Entity 2 -> Entity 1 Role Mandatory – If the “Second Entity” is required in the relationship then enter “TRUE”. Otherwise, leave this value blank.
 - g. Relationship Type – Identifies the cardinality between the two tables. The acceptable values are:
 - i. One – One
 - ii. Many – One
 - iii. One – Many
 - iv. Many - Many

All of this information is pertinent to understanding the data. Additional information that is helpful but not necessary is the data classification, the data steward name (this could be an individual or group), and rules that govern the sharing of the data.

Below are examples of the worksheets that will make up the data dictionary for a data repository containing information on human resources. The three worksheets are combined into one workbook.

This is a sample for the worksheet “Entity”.

Name	Comment
Staff	This table consists of the information on current and previous staff members.



Position	These are all of the positions within the agency as defined in the budget.
Assignments	These are the assignments or projects that staff are currently or have worked on in the past.
Department	These are the departments within the state agency.
Projects	This table contains a list of the projects or work activities.
Purchase Order	These are the purchase orders issued to buy products or services from vendors.
Vendor	These are the approved vendors from which goods or services can be purchased.
Contract	These are the contracts that are used to purchase products and servers from vendors.
Product	These are the products or services that vendors can sell to the state. In order to identify a product we need to know the vendor.
Budget	This entity contains the final approved budget plan for the agency. A budget record is defined by the department id, the appropriation code, the fiscal year, and the funding source.

This is an example of the worksheet for "Attribute"

Name	Entity	Comment	Data Type	Length	Mandatory	Primary Identifier
StaffID	Staff	The unique indicator issued to the staff member from the payroll system	Integer		TRUE	TRUE
StaffNameFirst	Staff	The first name of the staff member.	Variable characters (25)	25	TRUE	
StaffNameLast	Staff	The staff member's last name.	Variable characters (25)	25	TRUE	
StaffNameMI	Staff	The staff member's middle initial. If they do not have one this will be blank.	Variable characters (1)	1		
StaffAddr1	Staff	The staff member's work address, street number and name.	Variable characters (30)	30	TRUE	
StaffAddr2	Staff	The staff member's work address, additional information such as apartment number.	Variable characters (30)	30		
StaffAddrCity	Staff	The staff member's city in their work address.	Variable characters (25)	25	TRUE	
StaffAddrST	Staff	The staff member's state in their work address. Only postal abbreviations acceptable.	Variable characters (2)	2	TRUE	
StaffAddrZip	Staff	The staff member's zip code for their work address.	Variable characters (9)	9	TRUE	
StaffUpdUsr	Staff	The user who last updated the record.	Variable characters (8)	8		
StaffUpdDT	Staff	The date the record was last updated.	Date & Time			
PositionNum	Position	The unique number assigned to the position.	Integer		TRUE	TRUE
PositionTitle	Position	The title of the position.	Variable characters (25)	25	TRUE	
PositionPayGrade	Position	The pay grade for the position.	Variable characters (2)	2		
PositionUpdUsr	Position	The user who last updated the record.	Variable characters (8)	8		
PositionUpdDT	Position	The date the record was last updated.	Date & Time			
AssignID	Assignments	This is the unique id system generated to identify a person's assignment to a project or work activity.	Integer		TRUE	TRUE
AssignBeginDate	Assignments	The date the assignment initiated.	Date		TRUE	
AssignEndDate	Assignments	The date that the assignment completed.	Date			

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Data Model Samples

Name	Entity	Comment	Data Type	Length	Mandatory	Primary Identifier
AssignStatus	Assignments	A code indicating if person's assignment is active, completed, on hold, or pending.	Variable characters (1)	1		
AssignUpdUsr	Assignments	The user that last updated the record.	Variable characters (8)	8		
AssignUpdDT	Assignments	The date the record was last updated.	Date & Time			
DeptID	Department	The DDSS issued to the business unit. Example - Application Delivery Team Enterprise = 1104044000	Variable characters (10)	10	TRUE	TRUE
DeptName	Department	The name of the department - example Dept of Tech & Info/CTO/Applications Delivery.	Variable characters (25)	25	TRUE	
DeptBusUnit	Department	The name of the business unit. Example - Data Management Group.	Variable characters (25)	25		
DeptUpdUsr	Department	The user that last updated the record.	Variable characters (8)	8		
DeptUpdDT	Department	The date the record was last updated.	Date & Time			
ProjID	Projects	A unique number to identify a project.	Integer		TRUE	TRUE
ProjName	Projects	The name of the project or work activity.	Variable characters (50)	50		
ProjStatus	Projects	A code indicating the status of the project - active, completed, on hold, or pending.	Variable characters (1)	1		
ProjDesc	Projects	A brief description of the project.	Variable characters (250)	250		
ProjUpdUsr	Projects	The user who last updated the record.	Variable characters (8)	8		
ProjUpdDT	Projects	The date the record was last updated.	Date & Time			
PONum	Purchase Order	The purchase order number.	Variable characters (11)	11	TRUE	TRUE
PODT	Purchase Order	The date the purchase order was requested.	Date			
POQty	Purchase Order	The number of units being purchased.	Number (9)	9		
POCost	Purchase Order	The cost per unit of the item.	Number (9,2)	9		
POAmt	Purchase Order	The total amount of the purchase order. This is equal to the cost x quantity.	Number (12,2)	12		
POStatus	Purchase Order	A code indicating if the purchase order was approved (A), denied (D), on hold (H), or being reviewed (R).	Variable characters (1)	1		
PODesc	Purchase Order	A description of the items being purchased.	Variable characters (4000)	4,000		
POUpdUsr	Purchase Order	The user id of the person who last updated the record.	Variable characters (8)	8		
POUpdDT	Purchase Order	The date the record was last updated.	Date & Time			
VendorAddr2	Vendor	The secondary street address for the mailing location of the vendor.	Variable characters (30)	30		
VendorAddrCity	Vendor	The city name for the mailing location of the vendor.	Variable characters (25)	25		
VendorAddrST	Vendor	The state abbreviation for the mailing location of the vendor.	Variable characters (2)	2		
VendorAddrZip	Vendor	The zip code for the mailing location of the vendor.	Variable characters (9)	9		
VendorContactNameF	Vendor	The first name of the main contact for the vendor.	Variable characters (25)	25		

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Data Model Samples

Name	Entity	Comment	Data Type	Length	Mandatory	Primary Identifier
VendorContactNameL	Vendor	The last name of the main contact for the vendor.	Variable characters (25)	25		
VendorContactPhone	Vendor	The telephone number for the main contact for the vendor.	Variable characters (10)	10		
VendorStatus	Vendor	A code indicating if the vendor is active (A) or terminated (T).	Variable characters (1)	1		
VendorUpdUsr	Vendor	The user id of the person who last updated the record.	Variable characters (8)	8		
VendorUpdDT	Vendor	The date the record was last updated.	Date & Time			
VendorNum	Vendor	A number issued to uniquely identify the vendor.	Number (9)	9	TRUE	TRUE
VendorName	Vendor	The vendor's company name as it appears on their Delaware business license.	Variable characters (75)	75		
VendorLicNum	Vendor	The vendor's Delaware business license number.	Variable characters (15)	15		
VendorAddr1	Vendor	The street address for the mailing location of the vendor.	Variable characters (30)	30		
ContractNum	Contract	This is the contract number issued by the state to uniquely identify a contract.	Variable characters (11)	11	TRUE	TRUE
ContractStartDT	Contract	This is the date the contract begins.	Date			
ContractEndDT	Contract	This is the date the contract ends.	Date			
ContractTerms	Contract	These are the terms of the contract. They must comply with the state's requirements.	Variable characters (4000)	4,000		
ContractConditions	Contract	These are the conditions of the contract. They must comply with the state's requirements.	Variable characters (4000)	4,000		
ContractType	Contract	This is the type of contract. Acceptable values are: Professional Services Material Goods Technical Support Software Furniture	Variable characters (25)	25		
ContractUpdUsr	Contract	The id of the user who last updated the record.	Variable characters (8)	8		
ContractUpdDT	Contract	The date the record was last updated.	Date & Time			
ProdNum	Product	A number issued by the vendor to identify the product.	Variable characters (25)	25	TRUE	TRUE
ProdName	Product	The name of the product.	Variable characters (75)	75		
ProdDesc	Product	A description of the product.	Variable characters (4000)	4,000		
ProdType	Product	The product type.	Variable characters (25)	25		
ProdCost	Product	The cost per unit of the product.	Number (12,2)	12		
ProdUpdUsr	Product	The user who last updated the record.	Variable characters (8)	8		
ProdUpdDT	Product	The date the record was last updated.	Date & Time			
BudgetAppCode	Budget	The appropriation code as listed in the budget.	Number (4)	4	TRUE	TRUE
BudgetFiscal	Budget	The budget fiscal year.	Number (4)	4	TRUE	TRUE
BudgetFunding	Budget	A code indicating if it is general funds (GF), appropriated special funds (ASF), or non-appropriated special funds (NSF).	Variable characters (3)	3	TRUE	TRUE
BudgetAmount	Budget	The amount of money allocated in the budget.	Number (12,2)	12		



Data Model Samples

Name	Entity	Comment	Data Type	Length	Mandatory	Primary Identifier
BudgetUpdUsr	Budget	The user id that last updated the record.	Variable characters (8)	8		
BudgetUpdDT	Budget	The date the record was last updated.	Date & Time			

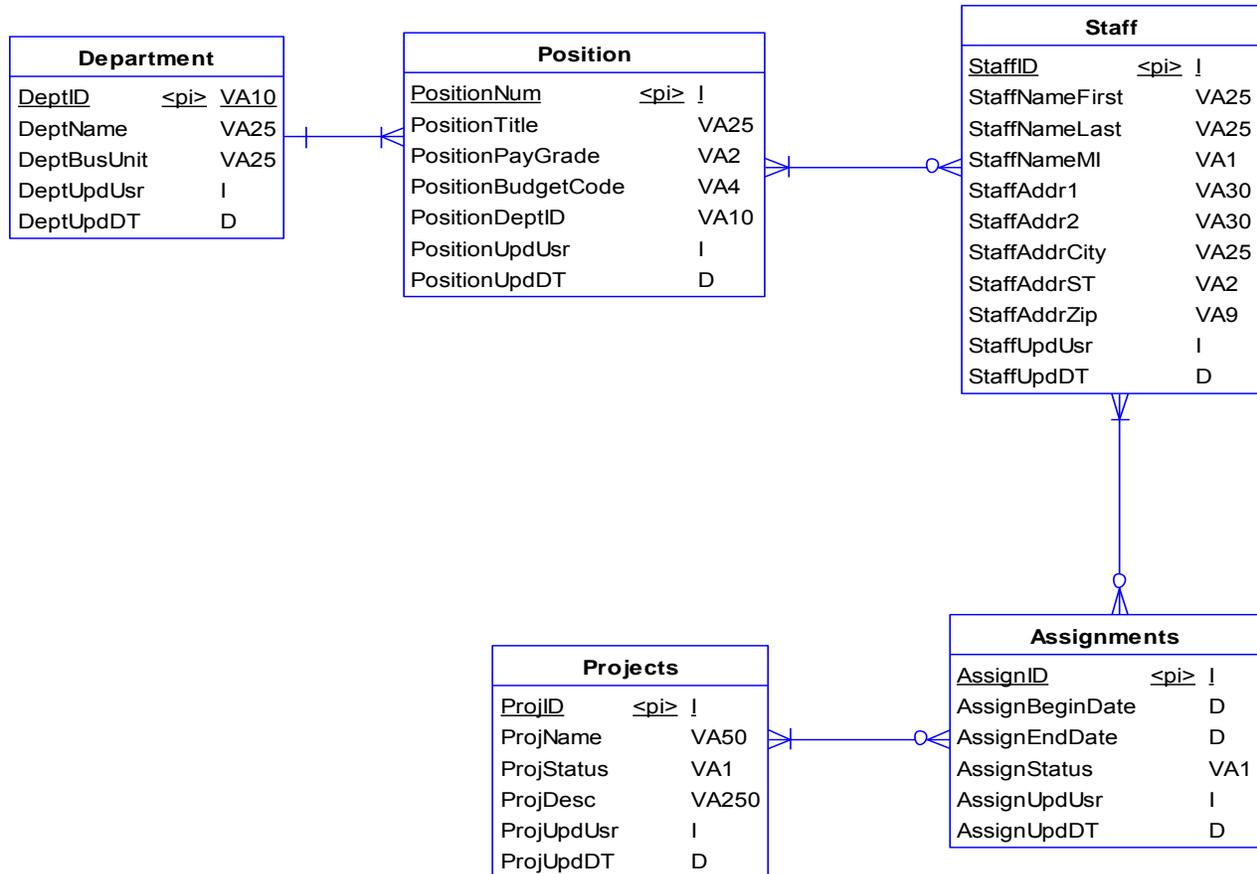
This is an example of the worksheet for "Relationship"

Name	Comment	First Entity	Second Entity	Entity 1 -> Entity 2 Role Mandatory	Entity 2 -> Entity 1 Role Mandatory	Relationship Type
Staff_Assign	A staff member can have one or more assignments. An assignment can belong to one or more staff members	Staff	Assignments		TRUE	Many - Many
Dept_Position	A department as one or more positions. A position belongs to only one department.	Department	Position	TRUE	TRUE	One - Many
Project_Assign	A project has one or more assignments. An assignment can belong to one or more projects.	Projects	Assignments		TRUE	Many - Many
Position_Staff	A position can have one or more staff members. A staff member can belong to one or more positions.	Position	Staff		TRUE	Many - Many
Project_PO	A project can have one or more purchase orders. A purchase order belongs to one project.	Projects	Purchase Order			One - Many
Contract_PO	A contract can have one or more purchase orders. A purchase order belongs to one contract.	Contract	Purchase Order		TRUE	One - Many
Contract_Product	A contract can have one or more products. A product belongs to one contract.	Contract	Product		TRUE	One - Many
Product_PO	A product can be on one or more purchase orders. A purchase order can have one or more products.	Product	Purchase Order		TRUE	Many - Many
Dept_Budget	A department has one or more budgets. A budget belongs to one department.	Department	Budget	TRUE	TRUE	One - Many
Budget_PO	A budget has one or more purchase orders. A purchase order belongs to one budget.	Budget	Purchase Order		TRUE	One - Many
Budget_Position	A budget contains one or more positions. A position belongs to one budget.	Budget	Position	TRUE	TRUE	One - Many
Vendor_Product	A vendor sells one or more products. A product belongs to one vendor.	Vendor	Product	TRUE	TRUE	One - Many
Vendor_Contract	A vendor has one contract. A contract belongs to one vendor.	Vendor	Contract	TRUE	TRUE	One - One



Section B - Sample Conceptual Data Model

This sample of a conceptual data model is what you might use to document the data an organization uses for managing human resources. Here we depict just a few of the main subject areas of data that can be captured in reference to the staff of an organization. We group the data into main subject areas (entities) based upon the type of information. We draw the links (relationships) between the subject areas. We also indicate the primary identifier(s) of each entity. The primary identifier indicates the uniqueness of a record. The primary identifier is useful for determining if additional entities are needed. For example, initially "Position" maybe included in "Staff". But since a person may have multiple positions over time, "Position" information becomes a separate subject area.





Data Classification	Public
Data Steward	Jane Smith – Human Resources
Sharing Rules	Information can be shared openly.

List of Entities

Name	Comment
Assignments	These are the assignments or projects that staff are currently or have worked on in the past.
Department	These are the departments within the state agency.
Position	These are all of the positions within the agency as defined in the budget.
Projects	This table contains a list of the projects or work activities.
Staff	This table consists of the information on current and previous staff members.

Entity – Assignments These are the assignments or projects that staff are currently or have worked on in the past.

List of Attributes of the Entity - Assignments

Name	Comment
AssignID	This is the unique id system generated to identify a person's assignment to a project or work activity.
AssignBeginDate	The date the assignment initiated.
AssignEndDate	The date that the assignment completed.
AssignStatus	A code indicating if person's assignment is active, completed, on hold, or pending.
AssignUpdUsr	The user that last updated the record.
AssignUpdDT	The date the record was last updated.

Entity – Department These are the departments within the state agency.

List of attributes of the entity Department

Name	Comment
DeptID	The DDSS issued to the business unit. Example - Application Delivery Team Enterprise = 1104044000
DeptName	The name of the department - example Dept of Tech & Info/CTO/Applications Delivery.
DeptBusUnit	The name of the business unit. Example - Data Management Group.
DeptUpdUsr	The user that last updated the record.
DeptUpdDT	The date the record was last updated.

Entity – Position These are all of the positions within the agency as defined in the budget.

List of attributes of the entity Position

Name	Comment
PositionNum	The unique number assigned to the position.
PositionTitle	The title of the position.
PositionPayGrade	The pay grade for the position.
PositionBudgetCode	The budget code assigned to the position. This links to the budget system.
PositionDeptID	The id of the department to which the position is assigned.
PositionUpdUsr	The user who last updated the record.
PositionUpdDT	The date the record was last updated.



Entity – Projects This table contains a list of the projects or work activities.

List of attributes of the entity Projects

Name	Comment
ProjID	A unique number to identify a project.
ProjName	The name of the project or work activity.
ProjStatus	A code indicating the status of the project - active, completed, on hold, or pending.
ProjDesc	A brief description of the project.
ProjUpdUsr	The user who last updated the record.
ProjUpdDT	The date the record was last updated.

Entity – Staff This table consists of the information on current and previous staff members.

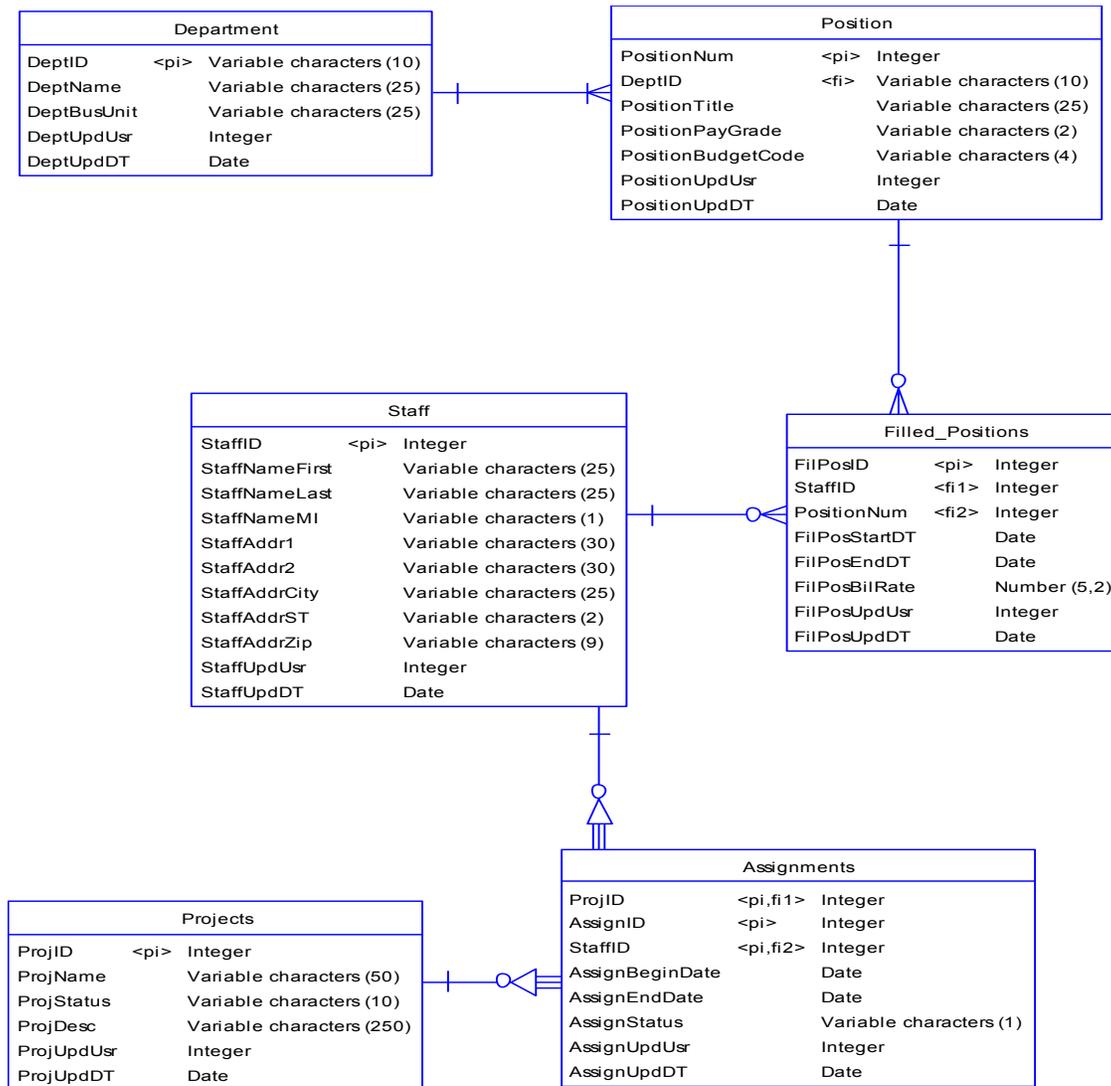
List of attributes of the entity Staff

Name	Comment
StaffID	The unique indicator issued to the staff member from the payroll system
StaffNameFirst	The first name of the staff member.
StaffNameLast	The staff member's last name.
StaffNameMI	The staff member's middle initial. If they do not have one this will be blank.
StaffAddr1	The staff member's work address, street number and name.
StaffAddr2	The staff member's work address, additional information such as apartment number.
StaffAddrCity	The staff member's city in their work address.
StaffAddrST	The staff member's state in their work address. Only postal abbreviations acceptable.
StaffAddrZip	The staff member's zip code for their work address.
StaffUpdUsr	The user who last updated the record.
StaffUpdDT	The date the record was last updated.



Section C- Sample Logical Model

The logical data model builds upon the conceptual data model by adding the primary and foreign keys. These create the links between the tables for the relationship rules that will be enforced by the database. Since databases cannot process rules of a many-to-many relationship, join tables are created between the entities. The relationship can also be defined as being dependent upon the primary identifier from the parent table.





Data Classification	Public
Data Steward	Jane Smith – Human Resources
Sharing Rules	Information can be shared openly.

List of Entities

Name	Comment
Assignments	These are the assignments or projects that staff are currently or have worked on in the past.
Department	These are the departments within the state agency.
Filled_Positions	This is a join table linking the staff to the positions they currently or have held.
Position	These are all of the positions within the agency as defined in the budget.
Projects	This table contains a list of the projects or work activities.
Staff	This table consists of the information on current and previous staff members.

Entity – Assignments These are the assignments or projects that staff are currently or have worked on in the past.

List of attributes of the entity Assignments

Name	Comment
ProjID	A unique number to identify a project.
AssignID	This is the unique id system generated to identify a person's assignment to a project or work activity.
StaffID	The unique indicator issued to the staff member from the payroll system
AssignBeginDate	The date the assignment initiated.
AssignEndDate	The date that the assignment completed.
AssignStatus	A code indicating if person's assignment is active, completed, on hold, or pending.
AssignUpdUsr	The user that last updated the record.
AssignUpdDT	The date the record was last updated.

Entity – Department These are the departments within the state agency.

List of attributes of the entity Department

Name	Comment
DeptID	The DDSS issued to the business unit. Example - Application Delivery Team Enterprise = 1104044000
DeptName	The name of the department - example Dept of Tech & Info/CTO/Applications Delivery.
DeptBusUnit	The name of the business unit. Example - Data Management Group.
DeptUpdUsr	The user that last updated the record.
DeptUpdDT	The date the record was last updated.

Entity - Filled_Positions This is a join table linking the staff to the positions they currently or have held.

List of attributes of the entity Filled_Positions

Name	Comment
FilPosID	A system generated number to uniquely identify the record.
StaffID	The unique indicator issued to the staff member from the payroll system
PositionNum	The unique number assigned to the position.
FilPosStartDT	The date the person started in the position.
FilPosEndDT	The date the person was no longer in the position.
FilPosBilRate	The hourly rate that a customer is billed.
FilPosUpdUsr	The user id of the person who last updated the record.
FilPosUpdDT	The date the record was last updated.



Entity – Position These are all of the positions within the agency as defined in the budget.

List of attributes of the entity Position

Name	Comment
PositionNum	The unique number assigned to the position.
DeptID	The DDSS issued to the business unit. Example - Application Delivery Team Enterprise = 1104044000
PositionTitle	The title of the position.
PositionPayGrade	The pay grade for the position.
PositionBudgetCode	The budget code assigned to the position. This links to the budget system.
PositionUpdUsr	The user who last updated the record.
PositionUpdDT	The date the record was last updated.

Entity – Projects This table contains a list of the projects or work activities.

List of attributes of the entity Projects

Name	Comment
ProjID	A unique number to identify a project.
ProjName	The name of the project or work activity.
ProjStatus	A code indicating the status of the project - active, completed, on hold, or pending.
ProjDesc	A brief description of the project.
ProjUpdUsr	The user who last updated the record.
ProjUpdDT	The date the record was last updated.

Entity – Staff This table consists of the information on current and previous staff members.

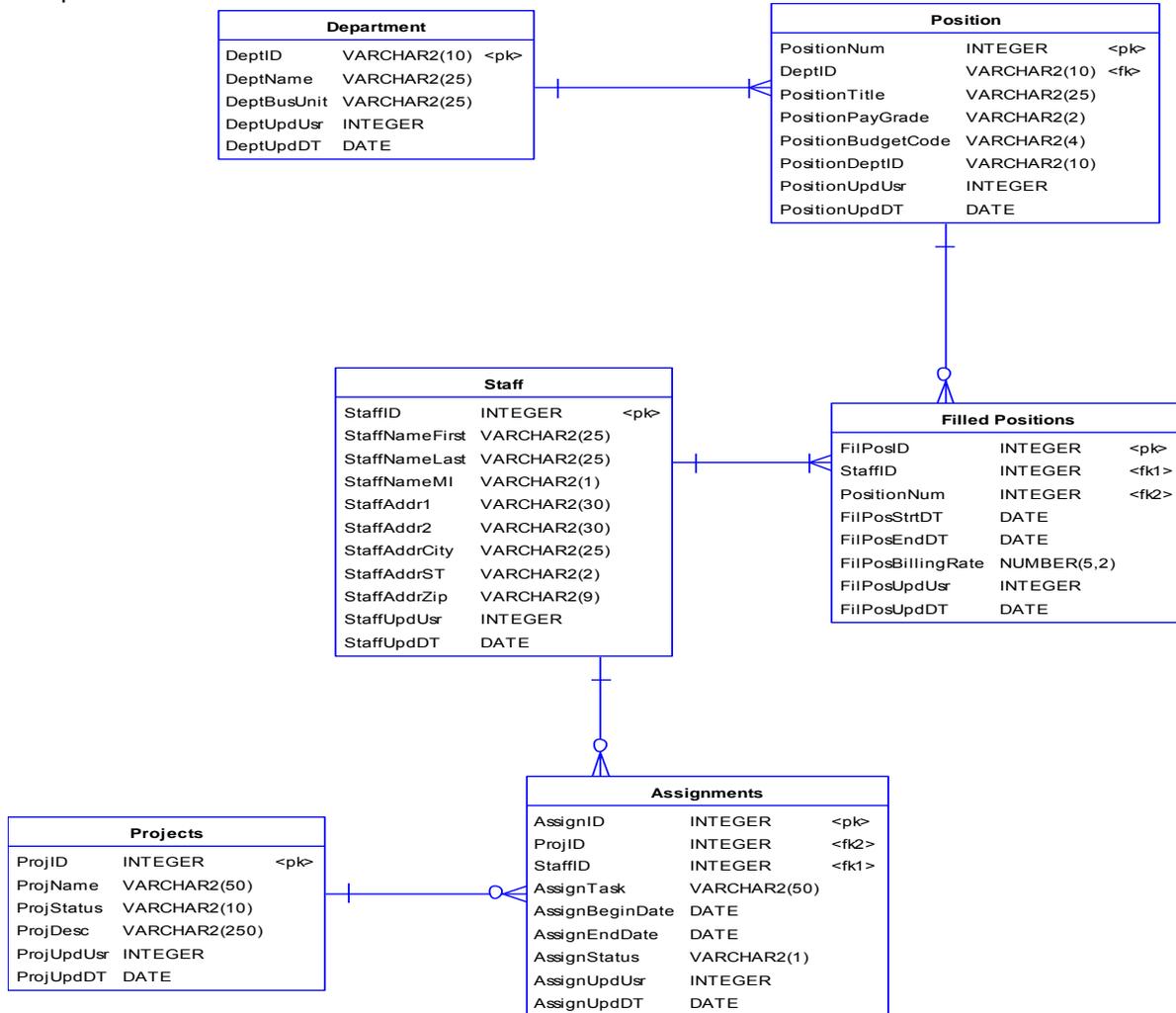
List of attributes of the entity Staff

Name	Comment
StaffID	The unique indicator issued to the staff member from the payroll system
StaffNameFirst	The first name of the staff member.
StaffNameLast	The staff member's last name.
StaffNameMI	The staff member's middle initial. If they do not have one this will be blank.
StaffAddr1	The staff member's work address, street number and name.
StaffAddr2	The staff member's work address, additional information such as apartment number.
StaffAddrCity	The staff member's city in their work address.
StaffAddrST	The staff member's state in their work address. Only postal abbreviations acceptable
StaffAddrZip	The staff member's zip code for their work address.
StaffUpdUsr	The user who last updated the record.
StaffUpdDT	The date the record was last updated.



Section D - Sample Physical Model

The physical data model builds upon the logical data model by adding constraints and indexes based upon the primary and foreign keys. The constraints further define the rules for the relationships between the tables that will be enforced by the databases. The indexes aide in the performance of the database when searching on the key columns. The physical data model is technology dependent. A type of database (i.e. Oracle, SQL Server, Informix, etc.) is selected which codes the data types specific to the technology. You can also add business rules to improve data quality (such as the list of accepted values in a column). You can add data mapping to show relationships between databases.





Data Classification	Public
Data Steward	Jane Smith – Human Resources
Sharing Rules	Information can be shared openly.

List of Tables

Name	Comment
Assignments	These are the assignments or projects that staff are currently or have worked on in the past.
Department	These are the departments within the state agency.
Filled Positions	These records relate staff members to positions, current and previous.
Position	These are all of the positions within the agency as defined in the budget.
Projects	This table contains a list of the projects or work activities.
Staff	This table consists of the information on current and previous staff members.

Table – Assignments These are the assignments or projects that staff are currently or have worked on in the past.

List of columns of the table Assignments

Name	Comment
AssignID	This is the unique id system generated to identify a person's assignment to a project or work activity. A new number is generated via a database trigger for each new combination of person, project, and task.
ProjID	A unique number to identify a project.
StaffID	The unique indicator issued to the staff member from the payroll system
AssignTask	The task name for the project.
AssignBeginDate	The date the assignment initiated.
AssignEndDate	The date that the assignment completed.
AssignStatus	A code indicating if person's assignment is active, completed, on hold, or pending.
AssignUpdUsr	The user that last updated the record.
AssignUpdDT	The date the record was last updated.

List of indexes of the table Assignments

Name	Unique	Cluster	Primary	Foreign Key	Alternate Key	Table
ASSIGNMENTS_PK	X		X			Assignments
RELATIONSHIP_2_FK				X		Assignments
RELATIONSHIP_7_FK				X		Assignments

Data Matrix for the table Assignments

Source Table	Source Column	Source Format	Table	Column	Format	Comment
ProjectPortfolio.ProjectTask	ProjectTaskStartDate	Date	Assignments	ASSIGNBE GINDATE	Date	Convert the date format. The source is formatted yyyy-mm-dd. The target needs to be dd/mm/yyyy.
ProjectPortfolio.ProjectTask	ProjectTaskFinishDate	Date	Assignments	ASSIGNEN DDATE	Date	Convert the date format. The source is formatted yyyy-mm-dd. The target needs to be dd/mm/yyyy.
			Assignments	ASSIGNID		
			Assignments	ASSIGNST ATUS		
ProjectPortfolio.ProjectTask	ProjectTaskName	Vchar50	Assignments	ASSIGNTA SK	Vchar50	
			Assignments	ASSIGNUP DDT		



			Assignments	ASSIGNUP DUSR		
ProjectPortfolio.ProjectTask	ProjectTask ProjID	Int	Assignments	PROJID	Int	
			Assignments	STAFFID		

Table – Department These are the departments within the state agency.

List of columns of the table Department

Name	Comment
DeptID	The DDSS issued to the business unit by the application that generates the number for all state organizations. Example - Application Delivery Team Enterprise = 1104044000
DeptName	The name of the department - example Dept of Tech & Info/CTO/Applications Delivery.
DeptBusUnit	The name of the business unit. Example - Data Management Group.
DeptUpdUsr	The user that last updated the record.
DeptUpdDT	The date the record was last updated.

List of indexes of the table Department

Name	Unique	Cluster	Primary	Foreign Key	Alternate Key	Table
DEPARTMENT_PK	X		X			Department

Table - Filled Positions These records relate staff members to positions, current and previous.

List of columns of the table Filled Positions

Name	Comment
FilPosID	The system generated number via a database trigger to uniquely identify the record.
StaffID	The unique indicator issued to the staff member from the payroll system
PositionNum	The unique number assigned to th position.
FilPosStrtDT	The date the staff member started in the position.
FilPosEndDT	The date the staff member left the position.
FilPosBillingRate	The rate that customers are billed for the staff member's services.
FilPosUpdUsr	The user who last updated the record.
FilPosUpdDT	The date the record was last updated.

List of indexes of the table Filled Positions

Name	Unique	Cluster	Primary	Foreign Key	Alternate Key	Table
FILLED_POSITIONS_PK	X		X			Filled Positions
RELATIONSHIP_4_FK				X		Filled Positions
RELATIONSHIP_5_FK				X		Filled Positions

Table – Position These are all of the positions within the agency as defined in the budget.

List of columns of the table Position

Name	Comment
PositionNum	The unique number assigned to the position generated from the application that tracks all positions in all state organizations.
DeptID	The DDSS issued to the business unit. Example - Application Delivery Team Enterprise = 1104044000
PositionTitle	The title of the position.
PositionPayGrade	The pay grade for the position.
PositionBudgetCode	The budget code assigned to the position. This links to the budget system.
PositionDeptID	The id of the department to which the position os assigned.



PositionUpdUsr	The user who last updated the record.
PositionUpdDT	The date the record was last updated.

List of indexes of the table Position

Name	Unique	Cluster	Primary	Foreign Key	Alternate Key	Table
POSITION_PK	X		X			Position
RELATIONSHIP_6_FK				X		Position

Table – Projects This table contains a list of the projects or work activities.

List of columns of the table Projects

Name	Comment
ProjID	A unique number to identify a project as generated in the project management application.
ProjName	The name of the project or work activity.
ProjStatus	The status of the project: active completed on hold pending
ProjDesc	A brief description of the project.
ProjUpdUsr	The user who last updated the record.
ProjUpdDT	The date the record was last updated.

List of indexes of the table Projects

Name	Unique	Cluster	Primary	Foreign Key	Alternate Key	Table
PROJECTS_PK	X		X			Projects

Table – Staff This table consists of the information on current and previous staff members.

List of columns of the table Staff

Name	Comment
StaffID	The unique indicator issued to the staff member from the payroll system
StaffNameFirst	The first name of the staff member.
StaffNameLast	The staff member's last name.
StaffNameMI	The staff member's middle initial. If they do not have one this will be blank.
StaffAddr1	The staff member's work address, street number and name.
StaffAddr2	The staff member's work address, additional information such as apartment number.
StaffAddrCity	The staff member's city in their work address.
StaffAddrST	The staff member's state in their work address. Only postal abbreviations acceptable
StaffAddrZip	The staff member's zip code for their work address.
StaffUpdUsr	The user who last updated the record.
StaffUpdDT	The date the record was last updated.

List of indexes of the table Staff

Name	Unique	Cluster	Primary	Foreign Key	Alternate Key	Table
STAFF_PK	X		X			Staff