

Information Technology Policy

Data Modeling Standards

Number

ITP-INF003

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Category

Information

Supersedes

All Prior Versions

Contact

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1. Purpose

This [Information Technology Policy \(ITP\)](#) establishes enterprise-wide standards for data modeling practices and supporting software, and promotes their effective usage for application development projects.

Establishing data modeling standards will ensure standardization and harmonization of business entities, establish common business definitions and provide guidance to agencies as they plan for new application development projects or make significant investments in existing applications.

2. Scope

This ITP applies to all offices, departments, boards, commissions, and councils under the Governor's jurisdiction (hereinafter referred to as "agencies"). Agencies not under the Governor's jurisdiction are strongly encouraged to follow this ITP.

Third-party vendors, licensors, contractors, or suppliers shall meet the policy requirements of this ITP that are applicable to the products and services provided to the Commonwealth.

3. Objective

This policy sets forth the standards that shall be followed by Commonwealth of Pennsylvania application development organizations in the preparation and maintenance of data models describing the data definitions, data structures, and data relationships supporting Commonwealth applications. Data modeling best practices and basic guidelines on data modeling are provided in the accompanying *BPD-INF003C, Data Modeling Best Practices* and *STD-INF003B, Data Modeling Basics* documents. *STD-INF003A, Data Modeling Products and Standards* document lists recommended software products that support the data modeling function.

The main objectives of this policy are to:

- Promote standardized and harmonized Commonwealth-wide definitions.
- Promote Commonwealth wide usage of common business and technical definitions including business rules and metadata.
- Promote and support the use of Data Administration and Data Modeling within the Commonwealth.
- Increase collaboration and data sharing opportunities across agencies, reduce data redundancy, and improve application interoperability.
- Promote agencies to adopt the principle of One – new models focused on digital initiatives for One (common) data model definition.
- Increase opportunities for consolidation of like data and business processes.
- Standardize and reduce proliferation of data modeling software tools that best meet current and future enterprise-wide data requirements, considering traditional, legacy, and web-based application development efforts.
- Leverage and reuse existing data models to the maximum extent possible.
- Build and start a foundation to avoid siloed definitions and rigid models and define a single enterprise business and technical model characterized with common definitions, common relationships, service oriented, flexible, and scalable model.

4. Policy

All new application development projects shall be required to use one of the current standard data modeling software products as defined in *STD-INF003A, Data Modeling Products and Standards*. Likewise, all new application development projects shall adhere to *BPD-INF003C, Data Modeling Best Practices*. Existing production applications are encouraged to adopt these standards as well. All IT projects related to application development or database design shall be subject to review for compliance with this standard.

4.1 Benefits of Data Modeling

The practice of data modeling helps with the identification of business requirements and the resolution of problems earlier in the development cycle, promotes effective communication of design ideas to the teams during the discovery and design phases of the process, and provides a strong foundation for future changes to the data.

Data models are foundations of defining the enterprise data definitions. The importance of the data models is increasing due to the Commonwealth moving towards standardized definitions and data driven transformations. Data models ensure consistent data definitions, standardized business structures, standardized technical structures, promote a high level of standardization, and phase out incorrect or redundant systems and system of systems. Further, they will be the key entities required for security definitions – system, data and cyber.

STD-INF003B, Data Modeling Basics presents a summary of the various levels of models that may be developed to define and support the business as well as the perspectives from which these models are used in the development process.

4.2 Model Types

There are three basic types of data models: conceptual, logical, and physical. A brief primer on the practice of data modeling and the function of each of the model types is presented in the supplemental document *STD-INF003B, Data Modeling Basics*. Please refer to this document for further details on each model type and explanations of steps

used in the process. Whenever new systems are developed or existing systems enhanced, these modeling steps shall be followed. Corresponding models shall also be created at the appropriate stages of discovery and design. Subsequently, models shall be managed effectively to promote reuse.

4.3 Data Modeling Best Practice Standards Supported:

A list of Data Modeling Best Practice Standards has been compiled by the Office of Data and Digital Technology (ODDT). These standards are presented in *the BPD-INF003C, Data Modeling Best Practice document*. The list has applicability across all current standard products and is required to be used for all application development efforts.

A data modeling methodology is currently being developed to provide additional guidance to agencies and will become part of the System Development Methodology. A [citizen](#) data model is also being developed and can be found in *BPD-INF003D Core Citizen Data Model and Data Elements*.

Defining a Core Citizen Data Model and Data Elements will:

- Assist in delivery of consistent and user-friendly experiences across all digital Services.
- Assist online destinations to have a consistent look and feel to ensure a single identity for Enterprise Services.
- Ensure all citizen information is concise, in plain language, and current.
- Facilitate and govern the ongoing transition of traditional non-digital services to a digital service platform.
- Establish a Citizen-First framework that promotes the innovative spirit and skills of the Enterprise through its personnel and technologies.
- Identify and Improve programs managing data, privacy, risk, and accessibility associated with Citizen Data.

5. Responsibilities

5.1 Agencies shall:

- Utilize one of the current standard Data Modeling Software products as defined in STD-INF003A Data Modeling Products and Standards for all new application development projects.
- Adhere to the best practices listed in BPD-INF003C Data Modeling Best Practices for all new application development projects.

5.2 Office of Administration, Office for Information Technology shall:

Comply with the requirements as outlined in this ITP.

5.3 Third-party vendors, licensors, contractors, or suppliers:

Third-party vendors, licensors, contractors, or suppliers creating custom applications on behalf of Commonwealth entities shall comply with the requirements as outlined in this ITP. If the third-party vendor, licensor, contractor, or supplier is not creating custom applications on behalf of Commonwealth entities, compliance is implied. If the third-party vendor, licensor, contractor, or supplier subsequently begins creating custom applications on behalf of Commonwealth entities in the future, compliance with the policy is required.

6. Related ITPs/Other References

- Definitions of associated terms of this policy are published on the Office of Administration's public portal: <http://www.oa.pa.gov/Policies/Pages/Glossary.aspx>
- Commonwealth policies, including Executive Orders, Management Directives, and IT Policies are published on the Office of Administration's public portal: <http://www.oa.pa.gov/Policies/Pages/default.aspx>
- [*Management Directive 205.34 Amended, Commonwealth of Pennsylvania Information Technology Acceptable Use Policy*](#)
- [*Executive Order 2019-04, Establishing a "Citizen-First" Government and Promoting Customer Service Transformation*](#)
- [*ITP-ACC001, Digital Accessibility Policy*](#)
- *STD-INF003A, Data Modeling Products and Standards*
- *STD-INF003B, Data Modeling Basics*
- *BPD-INF003C, Data Modeling Best Practices*
- *BPD-INF003D, Core Citizen Data Model and Data Elements*

7. Authority

[*Executive Order 2016-06, Enterprise Information Technology Governance*](#)

8. Publication Version Control

It is the [Authorized User](#)'s responsibility to ensure they have the latest version of this publication, which appears on <https://itcentral.pa.gov> for Commonwealth personnel and on the Office of Administration public portal: <http://www.oa.pa.gov/Policies/Pages/default.aspx>. Questions regarding this publication shall be directed to RA-ITCentral@pa.gov.

9. Exemption from this Policy

In the event an agency chooses to seek an exemption from the guidance within this ITP, a request for a policy waiver shall be submitted via the enterprise IT policy waiver process. Refer to [*ITP-BUS004, IT Policy Waiver Review Process*](#) for guidance.

This chart contains a history of this publication's revisions. Redline documents detail the revisions and are available to CWOPA users only.

Version	Date	Purpose of Revision	Redline Link
Original	08/2/2005	Base Document	N/A
Revision	11/18/2010	ITP Refresh	N/A
Revision	05/13/2021	ITP Refresh New ITP Templates and updated language Updated Exemption Section Updated Scope	N/A
Revision	09/09/2022	ITP Refresh Replaced definitions with links where applicable Added additional details to responsibilities section Duplicate information between the ITP and supplemental documents was replaced in the ITP with references to the corresponding supplemental document.	Revised IT Policy Redline <09/09/2022>