Developing and Sharing Your Business Requirements to Build a Better Data System

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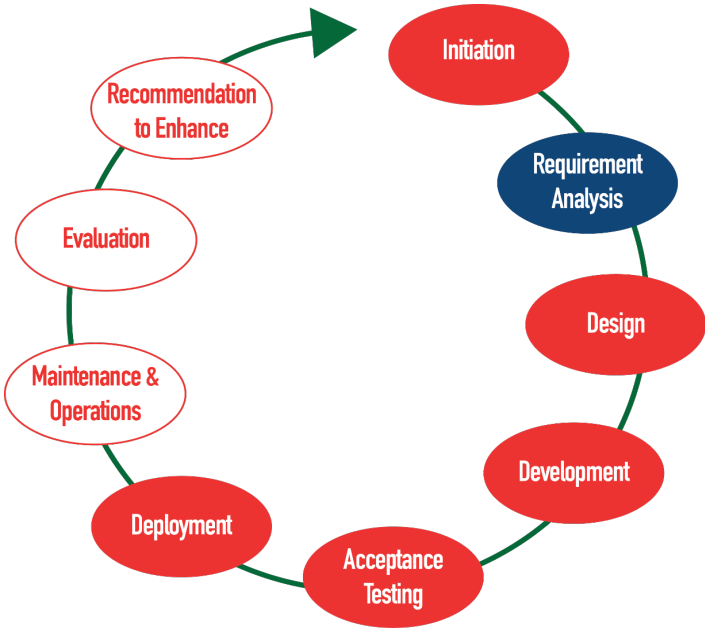
A Part C/619 data system can support multiple purposes for its users, such as fulfilling case management, data reporting, and service planning functions. When you are building or enhancing a data system, it is recommended that you communicate and document all potential uses of the system as written business requirements. Business requirements frame the system functionality and how the system will handle and store data. This document follows *Key Considerations for Initiating and Planning a New Data System or Major Data System Enhancement* and provides Part C/619 staff with an introduction to business requirements, which are part of the *Requirement Analysis* phase of the SDLC.

Figure 1. System Development Life Cycle



DaSy Framework Quality Indicator SD2 declares, "Part C/619 state staff are actively involved in the development of business requirements, process models, and data models for the data system/enhancement." Part C and 619 staff must actively participate in these design activities or they run the risk of not being able to get the most out of the data system, which leads to frustration on the part of program staff and Information Technology (IT) staff.

A System Development Life Cycle (SDLC) is a process used to develop data systems (Figure 1) that allows program staff and IT staff to work together to design, develop, and deploy a data system that makes reporting and analysis more efficient, accurate, and expedient. The first step of an SDLC, initiation, is discussed in *Key Considerations for Initiating and Planning a New Data System or Major Data System Enhancement*.

Data need to be configured, assembled, analyzed, reported, and used in a variety of ways. The different uses should drive the data system infrastructure and architecture and, therefore, should be directly reflected in the business requirements.

Business requirements are defined in the DaSy Glossary as *Constraints, demands, necessities, needs, or parameters of the* data system *defined by the consumer that must be met or satisfied, usually within a certain time frame.*

(Source: BusinessDictionary.com, http://www.businessdictionary.com/definition/requirements.html)

Business requirements relate to every aspect of the development or enhancement of a data system, including data collection, analysis, reporting, and storage. It is imperative that business requirements be influenced by knowledgeable stakeholders who will use the data system. Subject matter experts (SMEs), such as Part C/619 staff members, must be vocal and involved in identifying needs related to data collection, analysis, reporting, and storage. That is why DaSy Framework Quality Indicator SD2 declares, Part C/619 state staff are actively involved in the development of business requirements, process models, and data models for the data system/enhancement." Information technology (IT) personnel who develop and maintain the data system, although not Part C/619 program staff members, are very important, too, because they contribute their own content expertise to the process of identifying business requirements.

Process models and data models are also created during the system requirements analysis phase. Work on these models often starts right after the gathering of business requirements begins. In fact, it may be necessary and is often helpful to simultaneously define the supporting process and data models when defining business requirements. Because process and data models are visual in nature, they serve as an effective communication tool to facilitate discussions across users and technical staff. Ultimately, reconciling business requirements with the process and data models is important, ensuring both models accommodate all the necessary requirements. For more information on process and data models, see *Building a Better Data System: What Are Process and Data Models?*

There are different ways to conceptualize business requirements. Some literature differentiates *system* requirements from *business* requirements, with system requirements specific to how the system is to be built and business requirements referring to how the system is to be used. For the purposes of this document, both system and business requirements are considered "business requirements" and are discussed in four categories:

- functional,
- technical,
- operational, and
- transitional.

Later in this document, specific examples of business requirements related to Part C/619 data systems are provided. The concepts presented here can be found in more technical detail in the *New York Project Management Guidebook Release 2*, Section III.[1]

Identifying the Team to Develop the Business Requirements

The first step in developing business requirements is to specify roles from the project team identified during system initiation, and any additional staff members, who will take part in developing the business requirements. Roles that need to be represented are the business analyst who elicits and documents the business requirements, the data manager[2] who drives the business side of reporting needs, and the IT staff, particularly the IT lead and developer/ programmer, who provide current specifications and help identify emerging technologies. Additional personnel needed for business requirement development but who are not part of the project team are Part C/619 SMEs or other end user stakeholders who can contribute information about major business functions. Figure 2 lists the types of essential project team members and their role.

[1] New York State Office for Technology, (2003). *The New York State Project Management Guidebook, Release 2*. https://www.its.ny.gov/nys-project-management-guidebook-release-2

[2] The data manager is a Part C/619 staff member. He or she may serve multiple roles on the project team, including business analyst or subject matter expert.

Review Current System Specifications and Program Functions

To prepare for requirements development, the business analyst must determine what the current data system can and cannot accomplish. To do this, the business analyst gathers any current system specifications and historical documentation. The business analyst should implement a system for organizing these specifications early on so that when new functions are proposed later in the business requirements development process, she or he can easily determine whether the function will require a new system or an enhancement to the existing system.

The business analyst should identify relevant SMEs and other stakeholders who can contribute knowledge and insight into the major business functions, especially reporting, required of the program(s). The term "business" does not refer solely to the accounting or financial aspects of a program, although these may be part of the major business functions. Instead, "business functions" refers to any function of the Part C/619 program that would require the use of data. When all current system specifications, major functions, and potential stakeholders have been gathered and identified, the business analyst moves on to defining business requirements.

Figure 2. Project Team for Development of Business Requirements

Project Team Member	Role	Type of Staff
Business analyst	• Gather documents • Index documents • Understand current system capabilities and responsibilities	• Identified during project initiation; see *Key Considerations for Initiating and Planning a Major Data System Enhancement or New Data System* for more information
Part C/619 subject matter experts (SMEs)	• Provide documentation or anecdotal evidence of current system capabilities • Identify major business functions needed for data reporting and use	• Part C Coordinator • 619 Coordinator • Part C Data Manager • 619 Data Managers
Additional stakeholders	• Contribute knowledge about the major value and use of the data	• SMEs who will use the data system • Examples: Local programs or Local Education Agencies (LEAs)
Information technology (IT) staff	• Provide current system specifications • Provide agency future technology direction	• Developers/programmers • Data modelers/database administrators • Data architect • Technical maintenance staff

Define Business Requirements

The business analyst next collects the information needed to define requirements for any enhancements or new development. This is accomplished through a gap analysis. First, the business analyst reviews the historical documentation to understand the system's current capabilities and capacity. Then he or she facilitates sessions with the project team to determine new or enhanced business needs. The gap between a specific desired business need and current system capacity determines the focus of a specific business requirement. Collecting the totality of these business requirements is the work of the project team under the direction of the business analyst.

Part C staff should meet with the business analyst to discuss in-depth reporting about referrals, eligibility, IFSP, transition, early childhood outcomes data, and the like. Part B, Section 619 staff should meet with

the business analyst to discuss reporting about Individualized Education Programs, early childhood outcomes, educational environments, transition, etc. Having program staff articulate the nuances of the subfunctions enables the business analyst to better understand the needs of the stakeholders so that they can be relayed into business requirements the technical staff can implement. To facilitate sessions to determine business needs, the business analyst can use a variety of methods including one-on-one interviews, focus groups, surveys, and brainstorming. The goal is to hear from the identified Part C/619 SMEs about the necessary business functions and then deconstruct them into subfunctions. For example Individual Family Service Plans (IFSP) data can be deconstructed into child/family information (e.g., child's birthdate, family's address), planned services (e.g., type of services, frequency, intensity), and potentially delivered services, among others. (Each of those subareas can be further divided into numerous business functions and subfunctions.)

The business analyst may use prompting questions such as:

- What is the process for collecting and entering the data?
- What are the federal reporting requirements for Part C/619? When are reports due? Who is responsible for reporting? What are the steps required to analyze the data for the reports?
- What are the challenges faced when compiling information for a report? What would make it easier to compile the information for your report (e.g., having a particular type of table or other graphical display)?
- What data do you wish you had? Why?

When preparing for the development of business requirements, IT personnel are responsible for providing current system specifications. For this segment of the process, technical staff members attend all requirements gathering meetings or at the very least are kept apprised of any requirements gathering conversations. When the technical staff is aware of the program business needs, the business analyst can more efficiently define business requirements that meet the needs of the SMEs while working within particular constraints (e.g., budget, data system, technical staff's skill set).

Four Categories of Business Requirements

Once the requirements have been defined, the business analyst must draft written requirements. Requirements generally fit within one of the four categories—functional, technical, operational, and transitional—each of which provides necessary components for the system and requires input from project team members. Below, each of the four categories is defined, the team members are identified, and examples are provided. Which of these business requirements categories is used is determined by whether your agency is building a new system or enhancing an existing one. Each category will need to be considered for its relevance to the Part C619 data system. Part C/619 staff should work with the Project Team to determine what is best for the situation.

Functional Requirements

Functional requirements are those that affect the business process, such as requirements about features, various interfaces, and roles/authorization to the system. The business analyst typically gathers input for functional requirements from the SMEs. SMEs have the most knowledge about who needs access to the data and what level of access they need, what kind of information they need, what they want the system to perform, and how they want to view the information in value-added formats (reports, dashboards, etc.). In addition to the SMEs, the business analyst, data modeler/database architect (DBA), or another data architect should be present for the functional requirements development sessions.

Questions that can help define the **functional requirements** include

- Who needs access to the data in this system? For what purpose(s)? Do users need to be able to add/edit data, analyze data, or just see data?
- What kind of interface works best for the different system users? Do they need lots of user interface options (e.g., buttons, graphics), or do they just need access to raw data to query?
- Does the system need to be available 24/7 or accessible only during business hours?
- Will users send large data sets into the system at regular intervals (reporting periods)? If so, can this be done off hours or must it be completed instantaneously?

Functional requirements should be clearly stated and each requirement limited to a single concept, often stating the audience. Examples of **functional requirements** are

- The system will provide record-specific data entry privileges to Part C service providers and service coordinators.
- The system will provide agency-specific read only privileges to the local program coordinator.
- The system will provide full read/write/extract privileges to the state program data manager.
- The system will generate Part C/619 APR-ready outcome report for federal reporting purposes.

Technical Requirements

Technical requirements are the requirements that affect the system's infrastructure. Some topics for technical requirements include hosting, the environment, software, business intelligence tools, and technical constraints. Other examples of technical requirements, as noted in the DaSy Framework (SD3d), are encryption, system performance and load, and data conversion. Technical personnel are key during this process and include data/process modeler, data architect, technical services, and technical support. The business analyst should be present to ensure all concepts are captured for the requirements.

Questions that can help define the **technical requirements** include

- Who will host the environment? Where will it be located? What access will staff have for updates to the system?
- What regulations or constraints are associated with the data collected? Data storage?
- For child-level data, what level of encryption is required/desired for the data? What level for providers/staff?
- What is the disaster recovery plan? What are the backup processes?
- Will the application be on a dedicated or shared server? If shared, what are the demands on the other applications that might affect this data application?

Examples of **technical requirements** are

- The system will be backed up four times each workday and nightly on nonworkdays.
- The system's web application will incorporate, e.g., Secure Socket Layer (SSL) encryption for all connections.
- The system will convert data into another form to securely protect data so it cannot be understood by anyone except authorized personnel.
- The system shall allow X number of users to simultaneously access the system without significant (quantitative measure) performance load.

Operational Requirements

Operational requirements are the requirements that affect operations and support, such as maintenance of the system. Other examples of operational requirements noted in the DaSy Framework (SD3d) are data archiving, and audits and controls. Sessions on operational requirements should include technical staff, namely, the data modeler/DBA, data architect, technical services, and technical support.

Questions that can help define the **operational requirements** include

- How often will data be loaded into the system? What are the Part C/619 reporting cycles or periods to determine reporting cycles?
- What are the expectations for the system's performance during peak times? During nonpeak times?
- How much data will be stored in the system? What is the process for archiving the data?
- What types of controls are needed to allow for auditing the system? Does the system need to be transactional? That is, does the system need to track changes to the data by specific users by time?
- What are the plans for archiving the data? Which data should be archived? Which should be deleted? Can the archived data be purged at some point? If so, when? If not, what are the plans for increasing storage capacity?

Examples of **operational requirements** are

- The system will load Part C data at a rate of X records per minute during peak hours (8:00 a.m. – 5:00 p.m. Eastern) and X records per minute during nonpeak hours.
- The system will queue report requests to run at nonpeak periods with 97% of report requests generated within 4 nonpeak hours.
- The system will automatically archive records that are X days old.
- The system will automatically delete archived records that are X days old.

Transitional Requirements

Transitional requirements are the requirements that affect changes in implementation, such as moving from a vendor to in-house staff or conversion from an old system to a new one. Part C/619 staff should discuss the need for transitional requirements with their IT staff.

Some questions that can help define the **transitional requirements** include

- If moving from an old system to a new one, what historical data will be transitioned to the new system?
- What kind of data cleaning and conversion are necessary to store the historical data in the new system?
- What documentation of the new system capabilities needs to be captured?
- What training do technical personnel need to maintain the new system?
- What training do SMEs need to appropriately use the functions of the new system?

Examples of **transitional requirements** are

- Training about the new or enhanced data system will be provided for Part C/619 data managers before final deployment.
- Dual systems will be run until the SMEs and DBA determine that the new system has met all requirements.
- A data dictionary, user manual, and online tutorial will be developed to support use of the new system.

Summary

The data system requirements development process should result in a final document outlining all the requirements by category. The requirements will be used to design and build the new or enhanced data system and associated processes for its use. It is important that business requirements be reviewed and discussed by each of the contributing stakeholders to ensure they are adequately captured.

It is imperative that Part C/619 staff participate throughout the business requirements process. Otherwise, they run the risk of having a system built or enhanced that does not meet their needs.

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To learn more about the DaSy Center, go to http://www.dasycenter.org/.