

**Chapter: 5.0 Initiation, Requirements and Design Stage***Stage**Introduction:*

*SEM Express* combines the initiation and planning processes, the requirements definition process, the functional design process, and the system design process into one stage. This translates into the need for only one stage exit review and one structured walkthrough during this stage.

Refer to the SEM for additional guidance and documentation for the completion of individual detailed tasks, such as requirements gathering, if needed.

This stage involves development of the condensed Initiation, Requirements and Design Plan (SEM Exp-01). This template contains the mechanism to document software configuration management planning, system maintenance planning, system requirements specifications, system design specifications (both functional-based and system-based), and test planning.

If needs dictate, templates from SEM may be used in place of particular sections within the Initiation, Requirements, and Design Plan. For example, if it is determined that more detailed documentation is needed for Requirements Management than is available within the Initiation, Requirements, and Design Plan, the Requirements Specification and Requirements Traceability Matrix may be used to document business and technical requirements for the project.

The first activity of this stage is to **initiate and plan** the project, including development of the software configuration management needs of the system development environment. The State's Project Management Methodology (PMM) and the System Engineering Methodology (SEM) are tightly integrated, and thus, it is recommended that both *PMM Express* and *SEM Express* be used, rather than *SEM Express* and the full PMM or vice versa. It is imperative that the project manager ensures participation of the business client in the creation of both the PMM and SEM documents. Due to the abbreviated nature of *SEM Express* and *PMM Express*, it is advised to refer to the PMM (for project management assistance) and the SEM (for systems engineering assistance), as needed.

The **requirements definition** portion of this stage develops a basis of mutual understanding between the business owner/users and the project team with regards to the business requirements for the project. The result of this understanding is a mutually agreed upon requirements specification section within the Initiation, Requirements, and Design Plan - which becomes the initial baseline for product design and a reference for determining whether the completed product performs as the system owner requested and expected. All system requirements, (e.g., software, hardware, performance, infrastructure, etc.) should be included. This effort involves analysis of the business owner/users' business processes and needs, translation of those processes and needs into formal requirements, and planning the testing activities to validate the performance of the product.

In some installations, the base Requirements document is updated in addition to the Requirements Specification section of the Initiation, Requirements and Design Plan. Another approach for a system enhancement is to update the base Requirements document and attach a copy to the Initiation, Requirements and Design Plan.

The **functional design** portion of this stage maps the "what to do" of the requirements specification into the "how to do it" of the design specifications. During this activity, the overall structure of the product is defined from a functional viewpoint. The functional design describes the logical system flow, data organization, system inputs and outputs, processing rules, and operational characteristics of the product from the user's point of view. The functional design is not concerned with the software or hardware that will support the operation of the product or the physical organization of the data or the programs that will accept the input data, execute the processing rules, and produce the required output. The focus is on the functions and structure of the components that comprise the product. The goal of this activity is to define and document the functions of the product to the extent necessary to obtain the system owner and users understanding and approval and to the level of detail necessary to build the system design.

The **system design** portion of this stage translates the user-oriented functional design specifications into a set of technical, computer-oriented system design specifications, including design of the database structure and description of processes to the level of detail necessary to plan and execute the remainder of the stages. General module specifications should be produced to define what each module is to do, but not how the module is to be coded. Effort focuses on specifying individual routines and data structures while holding constant the structure and interfaces developed in the previous portion of this stage. Each module and data structure is considered individually during detailed design with emphasis placed on the description of internal and procedural details. The primary work product is a system design that provides a blueprint for the coding of individual modules and programs.

***Stage Inputs:***

The following items provide input to the Initiation, Requirements and Design Stage:

- Requirements identified in project related materials
- Related project pre-initiation materials, such as project justification documents, problem definition documents, etc.
- Existing system documentation, such as Requirements, Functional Design, and System Design

**Stage High-Level****Activities:**

High-Level activities in the Initiation, Requirements and Design Stage include, as applicable:

- Software Configuration Management Planning
- System Maintenance Planning
- Requirements Specification Development
  - Select Requirements Analysis Technique
  - Define System Requirements
  - Compile and Document System Requirements
  - Develop System Test Requirements
  - Develop Acceptance Test Requirements
  - Establish Functional Baseline
- Functional Design Development
  - Determine System Structure
  - Design Content of System Inputs and Outputs
  - Design User Interface
  - Design System Interfaces
  - Design System Security Controls
  - Build Logical Model
  - Build Data Model
  - Develop Functional Design
  - Select System Architecture
- System Design Development
  - Design Specifications for Modules
  - Design Physical Model and Database Structure
  - Develop Integration Test Considerations
  - Develop System Test Considerations
  - Conversion Planning
  - Develop System Design
  - Develop Program Specifications

Refer to the Systems Engineering Methodology for further detail regarding how to perform these activities, as needed.

**Stage****Touch Points:**

The following touch points are involved in the Initiation, Requirements and Design Stage:

**Contracts and Procurement**

- Assignment of a Contract Liaison if procuring goods or services
- Utilize the services of the assigned Contract Liaison, if procuring services
- Completion on DIT-0153 Bid Information Sheet if procuring goods or services
- Completion of DIT-0015a, if procuring commodities (e.g., servers, software)

- Completion of DIT-0015b (including Statement of Work), if procuring services (e.g., project management, application developers)

#### eMichigan

- If system is web-based, obtain an eMichigan web review assessment. Contact eMichigan for more information on obtaining this review.

#### Infrastructure Services

- If applicable, prepare the Infrastructure Services Request (DIT-0184)

#### Security

- Notify the Security Liaison of project initiation
- Review MDIT and Agency Security Policies
- Initiate Security Plan, including Data Classification and System Criticality sections
- Review State and Federal laws and regulations
- Develop Infrastructure/Network and Data Flow Diagram
- Review existing or propose new security controls
- Review Risk Analysis with OES recommended security controls

#### Other

- Initiate Business Continuity Planning process (DMB has a website for this purpose.)

### ***Stage Outputs:***

Several work products are developed during the Initiation, Requirements and Design Stage. The work products listed below are the minimum requirements for a small project. Deviations in the content and delivery of these work products are determined by the size and complexity of a project. Explanations of the work products are provided under the applicable activities described either in the SEM, in the PMM, or other applicable documents.

#### *SEM Express*

- Initiation, Requirements and Design Plan (*initial*)
  - Including attached SEM templates

#### *PMM Express*

- Project Charter
- Project Plan

#### Security

- Security Plan (*new or updated*)

#### Agency Services

- Business Continuity Plan (*new or updated*)