SEM Introduction

The *Systems Engineering Methodology (SEM)* provides guidance for information systems engineering related practices and procedures. The primary purpose of the methodology is to promote the development of reliable, cost-effective, computer-based solutions while making efficient use of resources. Use of the methodology will also aid in the status tracking, management control, and documentation efforts of a project.

The SEM was developed as an essential component of the Michigan *State Unified Information Technology Environment* (SUITE) initiative. The purpose of SUITE is to standardize methodologies, procedures, training, and tools for project and systems development lifecycle management throughout the Michigan Department of Technology, Management & Budget (DTMB) in order to implement repeatable processes and conduct development activities according to Capability Maturity Model Integrated (CMMI) Level 3 requirements. The SUITE model includes integration of the SEM with the State's PM methodology, process management, and supporting processes.

SEM Stages

The SEM is organized into seven stages:

- Initiation & Planning
- Requirements Definition
- Functional Design
- System Design
- Construction
- Testing
- Implementation

The positioning of these stages is depicted on the attached SEM Overview Diagram.

SEM Templates

There SEM templates, some of which incorporate checklists, help ensure appropriate team involvement, guidance, and approvals. The SEM Templates are depicted on the attached SEM Overview Diagram.

More info at www.michigan.gov/suite
SEM Process Guides

The SEM has three companion documents called Process Guides. These guides are designed to enhance the quality of the systems being developed or enhanced.

Structured Walkthrough Process Guide
Assists the project team with a formal process on how to ensure a deliverable is complete and of acceptable quality. A structured walkthrough is required for every major project deliverable.

Stage Exit Process Guide
Assists the project team in the transition from one SEM stage to the next. Stage exit approvals are required before moving to the next stage (e.g., Requirements Definition to Functional Design).

Testing Process Guide
Assists the project team in the use of different testing types and techniques.

SEM Touch Points

The SEM utilizes a concept known as "touch points," which are interfaces with other areas outside of your span of control. Touch points are intended to guide the team to engage the proper departmental resources at the correct times. SEM touch points are depicted on the attached SEM Overview Diagram.

SEM Express and SEM Tailoring

SEM Express was developed to manage small straight-forward projects. This guide has three stages instead of seven, allowing a streamlined approach to systems development. Chapter 2 of the SEM includes guidance on what components and templates are required, based on system complexity and size.

SEM System Maintenance Guide (SMG)

For systems in existence that require changes, the SMG contains guidance on maintaining systems, including information on system release management.

SEM/SUITE Training Components

Specialized workshops are available in Requirements Gathering, Structured Walkthroughs, the Stage Exit process, interfacing with Security, and others.

More info at www.michigan.gov/suite

Systems Engineering Methodology (SEM)

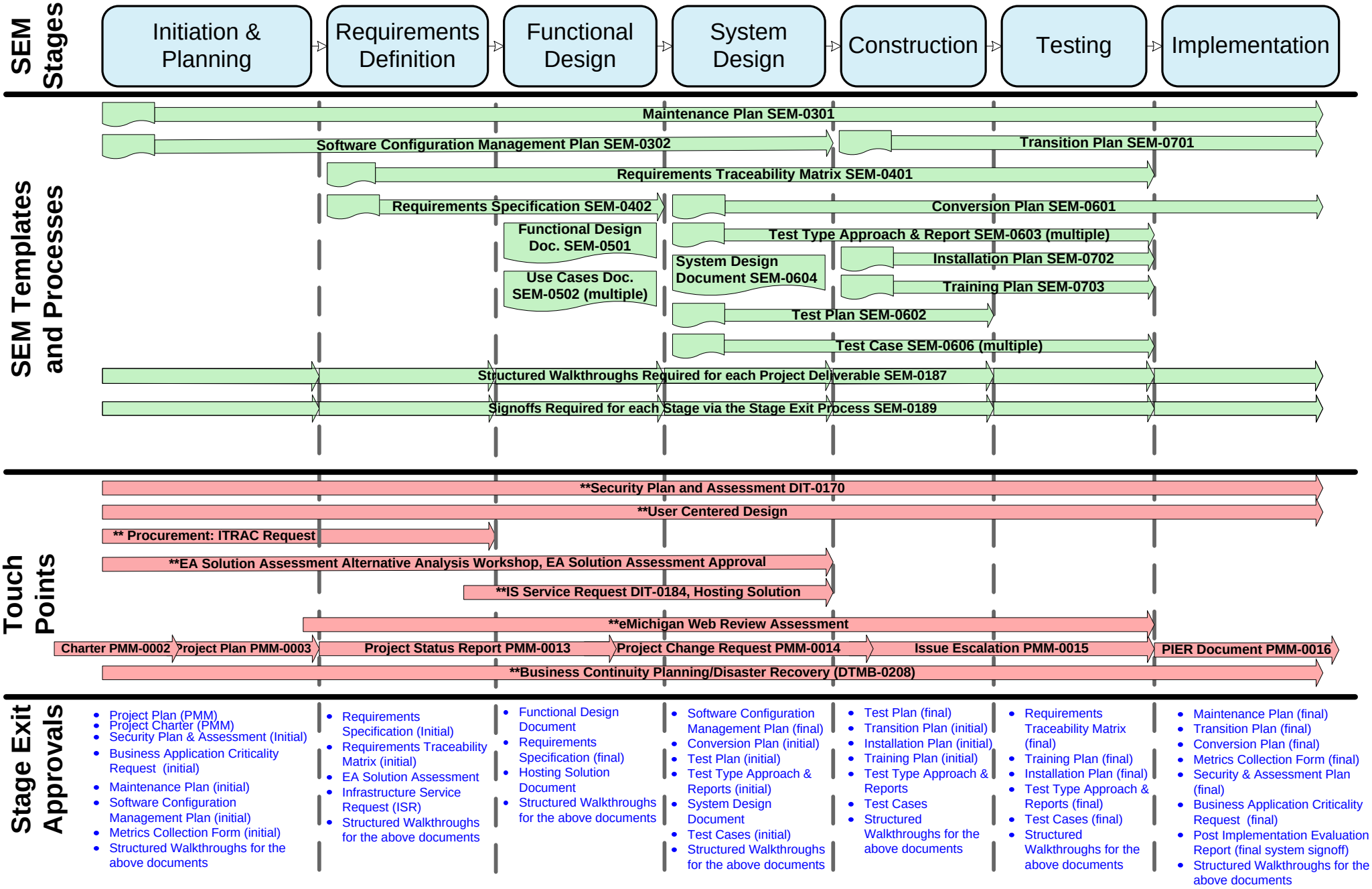
Quick Reference

A Ready Reference for planning and implementing information technology systems

January 2012

Michigan Department of Technology, Management & Budget
www.michigan.gov/suite
suite@michigan.gov

Systems Engineering Methodology (SEM) Overview



Stage Exit Approvals

- Project Plan (PMM)
- Project Charter (PMM)
- Security Plan & Assessment (Initial)
- Business Application Criticality Request (initial)
- Maintenance Plan (initial)
- Software Configuration Management Plan (initial)
- Metrics Collection Form (initial)
- Structured Walkthroughs for the above documents

- Requirements Specification (Initial)
- Requirements Traceability Matrix (initial)
- EA Solution Assessment
- Infrastructure Service Request (ISR)
- Structured Walkthroughs for the above documents

- Functional Design Document
- Requirements Specification (final)
- Hosting Solution Document
- Structured Walkthroughs for the above documents

- Software Configuration Management Plan (final)
- Conversion Plan (initial)
- Test Plan (initial)
- Test Type Approach & Reports (initial)
- System Design Document
- Test Cases (initial)
- Structured Walkthroughs for the above documents

- Test Plan (final)
- Transition Plan (initial)
- Installation Plan (initial)
- Training Plan (initial)
- Test Type Approach & Reports
- Test Cases
- Structured Walkthroughs for the above documents

- Requirements Traceability Matrix (final)
- Training Plan (final)
- Installation Plan (final)
- Test Type Approach & Reports (final)
- Test Cases (final)
- Structured Walkthroughs for the above documents

- Maintenance Plan (final)
- Transition Plan (final)
- Conversion Plan (final)
- Metrics Collection Form (final)
- Security & Assessment Plan (final)
- Business Application Criticality Request (final)
- Post Implementation Evaluation Report (final system signoff)
- Structured Walkthroughs for the above documents

****Templates available only at Inside DTMB forms index**

7/2012