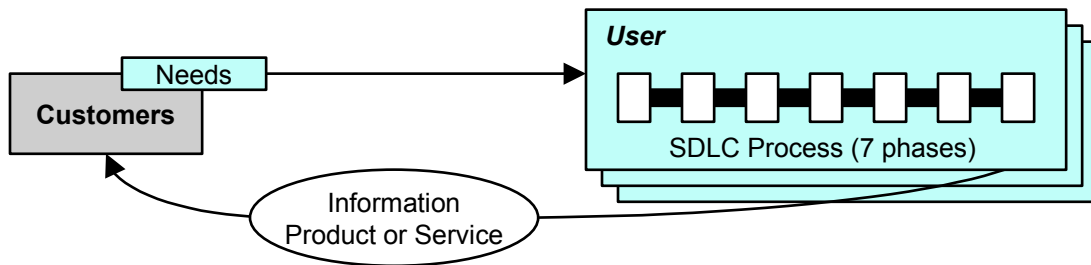


EXECUTIVE SUMMARY

This document provides an overview of the Systems Development Life-Cycle (SDLC) process of the U.S. House of Representatives. The SDLC process consists of seven tailored phases that help manage a wide range of activity to conduct projects or automate House activities with information technology. SDLC is not limited to technical activity but actually begins with customer needs and evolves through processes and user requirements to develop a solution or support process. A detailed explanation of SDLC procedures is outlined in a separate document and provides guidance, templates, checklists, and examples for successful implementation of this policy. The primary objective of implementing a standardized SDLC policy is to provide coordinated excellent service, at reduced costs, to support the activity of customers and users within the House community. This concept is shown as:



The first section of the policy explains the purpose, background, and basic systems development concepts in order to establish a context for policy description. The systems development methodology, project management practices, and management controls make up the SDLC environment to which this policy applies. The SDLC phase concept is further explained to ensure the policy or “ground rules” is understandable by individuals other than technology specialists. A simplified and common framework for implementing SDLC will improve communications and promote coordination across projects throughout the House community. The seven phases of SDLC are:

- | | |
|--|-------------------------------------|
| <i>Project Definition</i> | <i>System Build/Prototype/Pilot</i> |
| <i>User Requirements Definition</i> | <i>Implementation and Training</i> |
| <i>System/Data Requirements Definition</i> | <i>Sustainment</i> |
| <i>Analysis and Design</i> | |

The second section of the policy explains selected key terms, describes the SDLC concept, and describes each phase of SDLC in greater detail. SDLC is not a common practice in performing daily tasks but is critical to develop ways to support daily tasks, and requires the cooperation of everyone involved. This SDLC policy requires that seven SDLC phases be used to conduct projects within the House environment, and a project notebook maintained to track the status of a project related to the SDLC phases. Policy also requires a Work Breakdown Structure (WBS) be created to describe the work and schedule of project activity, appropriate to project scope and level of effort. The WBS will be used as the basis for projecting resource requirements and cost estimates.

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Section 1

POLICY OVERVIEW

1.1 Purpose

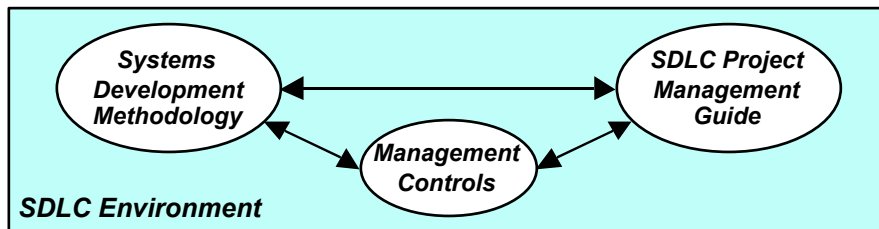
This policy establishes a consistent set of management practices and terms to conduct systems development in the House environment. The Committee on House Administration (CHA) has established a need for revised policy providing a high-level plan to support the goals and objectives of Members and House staff. This policy establishes a standardized process for conducting projects and automating House business processes.

1.2 Background

The House of Representatives is a unique environment requiring the customization of industry technology practices to automate House activity for effective and efficient operations. Tailoring of a Systems Development Life-Cycle (SDLC) policy in the House environment allows the House to benefit from industry technology and avoid costly software development. A clear and simplified SDLC policy provides a basis for all House staff participation in systems development in a way that provides common understanding and promotes checklist style steps. A structured and consistent approach to systems development ensures successful technology initiatives that are coordinated among the different areas within the House community. The Office of the Chief Administrative Officer (CAO), with support provided by other House offices, supports the House of Representatives in networking, telecommunications, and automation of support processes.

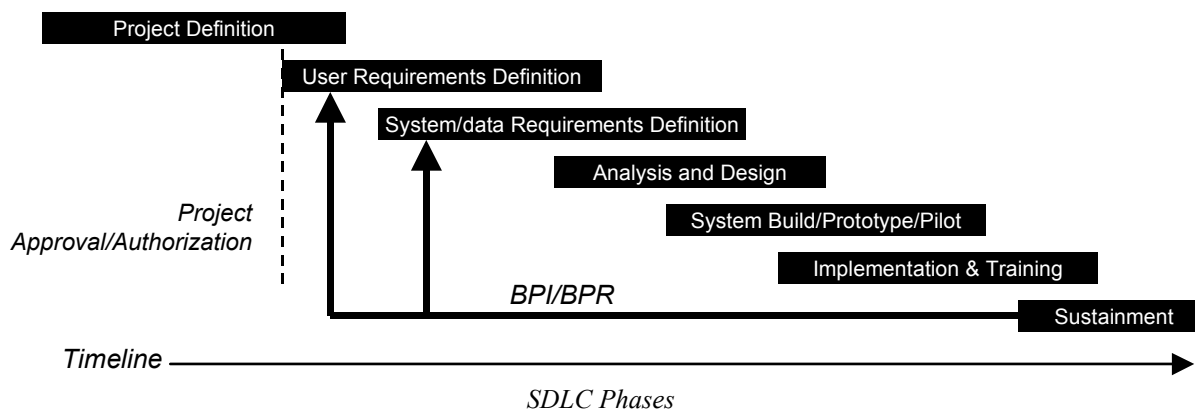
1.3 Systems Development

Systems development in the House environment is a specific effort to automate House activity (business processes) by using hardware, software, people, and procedures. The SDLC process is defined as an organized way to determine customer needs and user requirements such that technology can be applied through systems development, and help customers and users perform their jobs more effectively and efficiently. The process ends with maintenance and sustainment activities but includes a way to use feedback for continuous improvement of processes and systems. Project management is a tool used to manage the use of a systems development methodology (a structured approach to systems development), and ensure systems are built that help the users and customers. The SDLC environment includes a systems development methodology, project management guide, and management controls to establish a level of checks and balances to ensure a successful process. This relationship is shown as follows:



1.4 SDLC Phase Concept

The SDLC phase concept is used to describe functional systems development activity, to gain control of the complexities of systems development, and to ensure the needs of customers and users are the basis for technical activity. The SDLC process is best described as a series of phases occurring in various degrees and stages of overlap. The diagram below shows the seven major phases of systems development tailored to the House environment and the overlap that may occur during execution.



The SDLC phases provide an excellent opportunity to control, monitor, and audit the systems development process, and ensure customer and user satisfaction. A feedback process supporting Business Process Improvement (BPI) and Business Process Reengineering (BPR) is critical to ensure the correct process or activity is the basis for the technical activity leading to systems engineering and automation.

It is necessary to draw a distinction between the seven SDLC functional activities (phases) and functional tasks that occur within the phases. The SDLC phases provide an opportunity for the House to manage and track the creation, approval, and progress of projects or information technology initiatives. The functional tasks are managed for each project and may occur within one or more phases. Specific tasks, such as technology evaluations and demonstrations, may be conducted across several SDLC phases to ensure user and system requirements are defined that are achievable with current technology. It is important to identify the mandatory tasks for all projects to provide consistency among House projects. The seven SDLC phases should be used as a checklist to ensure that each project is managed in a consistent and thorough manner at a level matching the project scope. Functional tasks will be described in section two of this policy as they relate to the SDLC phases.

1.5 SDLC Phases

Summary definitions of the seven SDLC phases are provided below:

Project Definition – The project definition phase prompts collection of information for the CAO and CHA to determine if a project warrants the investment of personnel resources and funding. The project definition should identify the customer, user, mandate, and basic operating concept. Additionally, the project definition should provide a preliminary investigation of alternatives and risk analysis, and a high level cost-benefit analysis to determine if the project has a favorable return on investment. The project information should show the expected cost increase or decrease and the capabilities or benefits gained, and is critical to the project approval process. The program and project manager should be identified as well as projected costs for training and sustaining efforts after the project is completed. The key output of this phase is knowing exactly what the scope of the project is prior to committing funding and resources, including the project timetable with milestone dates and resource estimates, and a formalized approval/authorization or disapproval of the project based on the project definition.

User Requirements Definition – The user requirements definition phase is based on the processes that users conduct in their day-to-day activity. The user requirements should clearly describe what part of the user process (activity) should be automated or enhanced, and the expected capabilities and features. There may be a number of other tasks to perform prior to developing the user requirements, such as interviews, objectives identification, and defining

operating concepts. The key output of this phase is a summary document of user requirements that explains what the system is supposed to do.

System/data Requirements Definition – The system/data requirements definition phase is based on merging user processes and requirements in a way that allows a system to support many different users or functions in similar areas. The system/data requirements phase marks the start of establishing key technical areas to use technology to make the work easier. Technical requirements are usually established as a sub-set of the system/data requirements and incorporate existing systems and technologies currently used by the organization. Data requirements are a critical road map for any information system designed to process data. The key output of this phase is a summary document of system/data requirements that explains what the system should be built to, how data should be processed, and what technical or support requirements may exist. In addition, security and internal control related requirements are also developed as appropriate to the scope of the project.

Analysis and Design – The analysis and design phase is a complex and critical step in determining which system design, based on systems engineering and technology analysis, meets the user and system requirements. For non-technical solutions, the design may simply be a support process to be implemented over time. The design may be presented as several options with trade-off analysis or a specific configuration, and may consist of Commercial-off-the-shelf (COTS) products (preferred approach) or customized development. Procurement options and cost information should be identified as determined by resource requirements and the design. The most significant milestone in this phase is the recommendation of what to do or buy in order to meet the user and system requirements.

System Build/Prototype/Pilot – The system build phase is the execution of the approved design and in some cases may blend into the implementation phase. A smaller test system is sometimes a good idea in order to get a “proof-of-concept” validation prior to committing funds for large scale fielding of a system without knowing if it really works as intended by the user. For non-technical solutions, the system build may involve creation of a support process and move directly to implementation. Procurement activity begins in this phase and may be expanded with deployment during implementation. The validation, verification, and testing plan should drive the system testing and be conducted against the system/data and technical requirements to ensure the system is built to specification. System testing should also be conducted against the user requirements to ensure the system is operationally satisfactory. The prototype or pilot concept also allows for refinements or adjustments based on user feedback prior to a larger scale implementation. The key output of this phase is validation of the design prior to full commitment.

Implementation and Training – Implementation includes all necessary activity to procure, receive, configure, and install the new or revised system. For non-technical solutions, implementation may be limited to a new support process requiring a change in the business process. Training is conducted during this phase according to the training plan, which would have been developed in one or more of the previous phases. A “transition” or “cut-over” plan, including any required data conversion, will also be required to ensure a smooth transition to the new system without interrupting services. The development of appropriate documentation, such as manuals for operations and maintenance, are required for successful transition. The impact of running old and new systems simultaneously should also be analyzed to determine if there would be excessive burden in operating expenses or personnel support. Testing also takes place in this phase and validates the usability of the system or support process through reports such as test analysis, security evaluations, and system accreditation. System accreditation is the formal process for determining if the system meets user expectations (user acceptance) as outlined by the user requirements. The key output of this phase is a successful transition to the new system with uninterrupted service.

Sustainment – The sustainment phase is a dedicated effort to keep the system operating at an optimum level by conducting maintenance and enhancements as determined by periodic reviews. For non-technical solutions, sustainment may be the continuation of a support process. Changes in the environment, customer and user needs, or technology may prompt business process improvement or reengineering initiatives to validate or revise the business process. Sustainment may also include changes to the system based on technology advancement and can be addressed through system enhancements or redesign initiatives. Sustainment activity may be conducted by CAO personnel or contractors and be supervised by CAO staff or other House technical staff. Continuous improvement is a requirement of the sustainment phase and shall be reviewed by identifying standards and measures of performance, and documented in project status reviews. Change management and quality assurance is also a requirement in this phase to ensure proper documentation of the system configuration in a thorough and accurate manner.

1.6 Roles and Responsibilities

The Committee on House Administration has assigned the CAO with the primary responsibility of implementing an SDLC process. There are several groups that have key roles and responsibilities in the successful implementation of an SDLC process. The assigned role describes what type of participation the group will have and the responsibility describes what tasks, events, or activities the group will engage in for SDLC related activities.

The Chief Administrative Officer (CAO)

Role – The CAO will perform as an executing body and coordinate the establishment of appropriate advisory councils and working groups, and coordinate participation of individuals or groups outside the CAO.

Responsibilities – The CAO has the following responsibilities for SDLC related activity:

- (1) The CAO will coordinate the establishment of an Information Resources Management Advisory Council (IRMAC) or other such body with a role of steering SDLC concepts based on the environment of the House and current needs of the Members and Committees. The IRMAC will also advise on strategic initiatives and budget considerations. Appendix A of this policy describes the IRMAC mission and charter.
- (2) The CAO will ensure the establishment of a Technology Coordination Task Force (TCTF) or other such CAO body with a role of developing, guiding, and implementing project management, procedures, and concepts to conduct systems development in an integrated and coordinated manner. The TCTF will be chaired by the HIR Associate Administrator or designated representative and maintain representation from all major groups within the CAO. The TCTF shall also establish and dissolve temporary steering committees, as required by project activity, to oversee operational implementation for specific initiatives or projects. The TCTF will forward recommendations and issues to the IRMAC requiring approval or guidance above the CAO. Appendix B of this policy describes the TCTF mission and charter.
- (3) HIR will establish specific procedures and methodologies for conducting systems development in the House environment and provide training to maintain a level of common understanding and coordinated effort. HIR will additionally conduct and track SDLC training and awareness to ensure the House benefits from effective use of SDLC.

Authority – The CAO has authority to develop project management and systems development guides to assist the House community in participating in the SDLC process.

The Office of Inspector General (OIG)

Role – The OIG will perform in a review and advisory capacity and develop recommendations for improved operations and cost effective alternatives.

Responsibilities – The OIG has the following responsibilities for SDLC related activity:

- (1) The OIG will provide representation to the IRMAC or other such body as coordinated by the CAO. The OIG will provide guidance on best practices, strategic visions, and implementation of systems development concepts in the House environment.
- (2) The OIG will conduct periodic reviews of the SDLC process and make recommendations to improve or enhance the SDLC process based on industry best practices as modified by the unique requirements of the House environment.

Authority – As provided in House Rules IV, the OIG is responsible for conducting periodic audits of financial and administrative functions of the House. This authority includes reviews of the SDLC process and related activities, using best industry practices.

The Committee on House Administration (CHA)

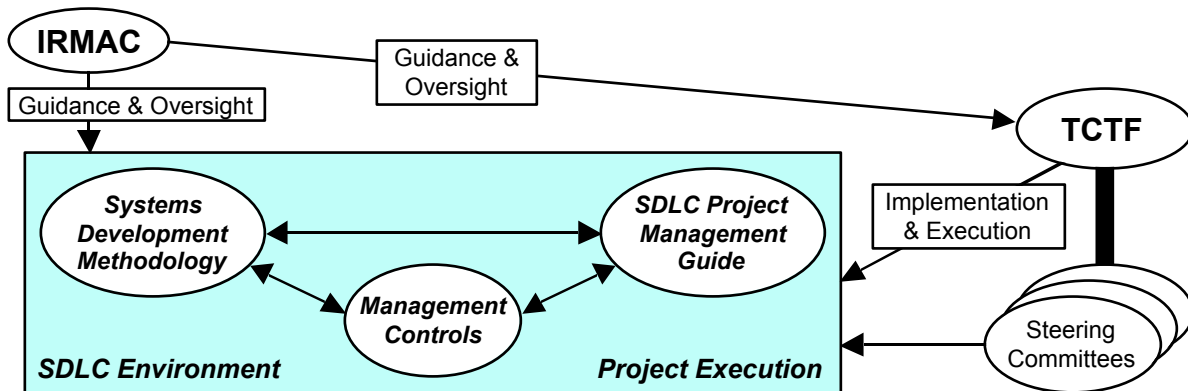
Role – The CHA will perform in a review and advisory capacity and provide oversight guidance in the best interests of Members and Committees, and the House in general, related to information technology and service support.

Responsibilities – The CHA will provide representation to the IRMAC or other such body as coordinated by the CAO. The CHA will review and approve policies or activity as recommended by the CAO.

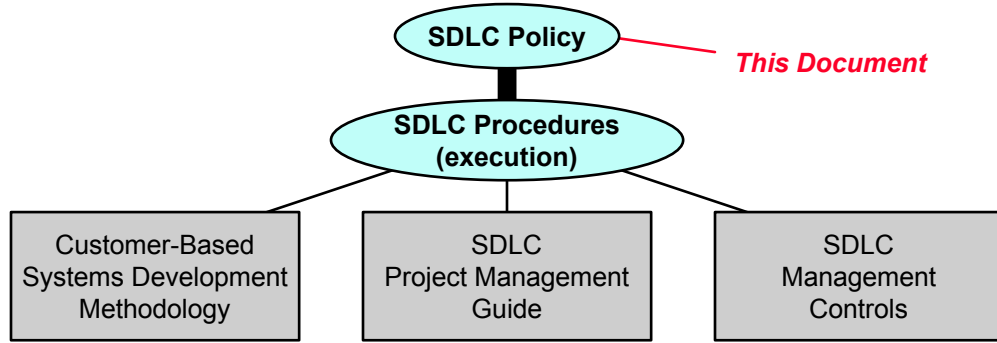
Authority – The CHA has the authority to establish or adjust all activities related to the SDLC process in the House environment.

1.7 Relationships

The roles of Information Resources Management Advisory Council (IRMAC) and Technology Coordination Task Force (TCTF), or similar bodies, are an important part of making the SDLC process work in the House environment. The IRMAC provides an advisory or steering role to ensure SDLC is tailored to the House environment while the TCTF provides development and implementation of specific procedures or concepts for successful projects. Determining “*what to do*,” given the uniqueness of the House environment, is the primary role of the IRMAC. Determining “*how to do it*” and “*doing it*” is the primary role of the TCTF. The program and project managers are the detailed executors of project work but the TCTF is the over-arching execution body that ensures SDLC and coordinated efforts achieve excellent service at reduced costs. Steering committees under the TCTF serve as temporary or longer-term working groups that engage in activity extending beyond a particular project or system. TCTF steering committees provide critical support in bridging the gap between the users, technology, and inter-relationships of project areas. The relationship of the SDLC environment to the IRMAC and TCTF is shown as follows:



Systems development methodologies, project management guidance, and management controls are methods of addressing specific areas of SDLC implementation. SDLC procedures provide more detailed guidance on implementing SDLC and specify preferred formats, template structures, or report content. Each of the three areas of the SDLC environment may also have detailed procedures developed to fit the organizations or groups using SDLC and will typically change or evolve with execution. A systems development methodology outlines details of the House approach to implementing SDLC consistent with industry best practices, which also evolves with technology and process change. Project management is a structured approach to managing the use of methodologies to conduct projects or provide a support service. Project management courses are readily available from industry or within House training opportunities while industry software tools, such as Microsoft Project, are available to help manage project activities. A well-defined SDLC process will help leverage existing technologies and support the House community at an affordable price. Management controls contain elements from both the systems development process as well as programmatic practices and ensure close coordination between the two. The CAO and HIR are responsible to develop specific procedures and guides, through the IRMAC and TCTF, to support the implementation of an SDLC process tailored to the House environment. The relationship of this policy to specific procedures, methodologies, and guides is shown as follows:



The SDLC policy is supported by SDLC procedures established within the organizational area implementing SDLC or across the House community. The SDLC procedures are maintained in separate documentation and provide detailed guidance on the implementation of the SDLC process. Project management and systems development methodologies are more fluid in nature and are continually updated to reflect and take advantage of the best practices of industry. Programmatic tools, such as Microsoft Project, are available to track project activity using Gantt chart style schedules.

Section 2

SDLC POLICY

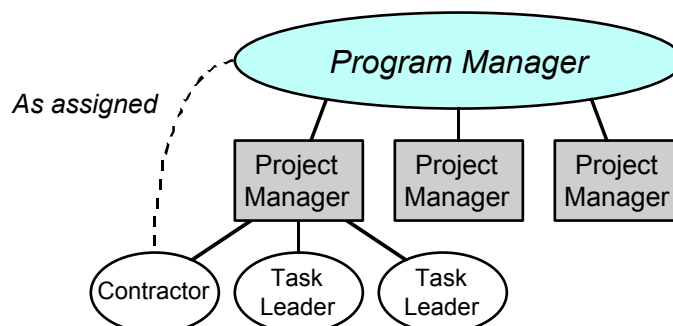
The SDLC process outlined in this document provides a standardized method to help manage a wide range of activity to conduct projects or automate House activities with information technology. This process can be used on any selected project whether or not technology is used to automate the activity. The SDLC policy requires execution of projects within the framework of the seven identified phases and tracking with a project notebook to reflect the SDLC status of projects at any given time. The practice of conducting structured systems development, by developing customer-based processes and solutions, promotes a smarter and less expensive way of doing business in the House.

2.1 SDLC Key Terms

There are many different terms and expressions associated with systems development and project management. In order to provide a common basis for defining the SDLC phases and activities, some selected terms and definitions are provided to help develop the context for SDLC policy in the House environment.

Program/Project Manager

Program manager and project manager are two terms sometimes used interchangeably but actually differ in their roles. The program manager has overall responsibility for all projects within the program and the project manager is responsible for executing the task elements of the project. The following diagram shows the program and project manager relationships:



Designation of the program manager should be based on whether the project serves a dedicated group or serves an infrastructure role to support a wide user base where no particular group has ownership of the service or system. In the case of a dedicated type of project or system, the program manager should possess some background from the user perspective in order to ensure the user processes and requirements are fully represented in the project activity. For infrastructure type projects, the program manager can be selected from a wider experience base but should have experience in the technical area of the project and sound program management skills. The project manager will be selected for the specific skills necessary to execute the task elements of the Work Breakdown Structure (WBS), or simply, possess the skills and experience to manage the work necessary to complete the project.

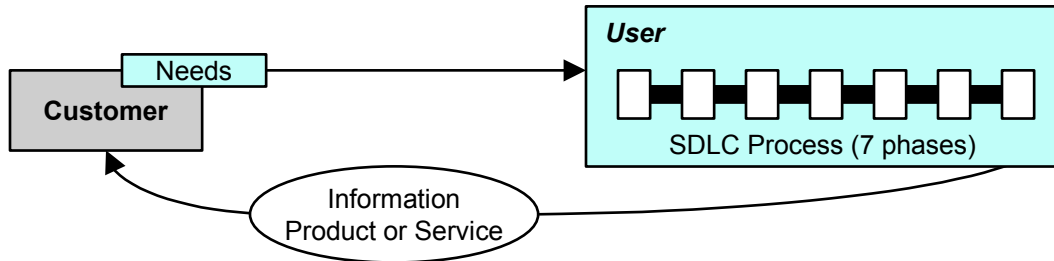
Program Manager - The program manager is responsible for managing programmatic activities such as personnel resources, budget, schedule, user involvement, and overall status of the program. For example, the program manager would be responsible to ensure items like a Statement of Work (SOW) and user requirements are included in a procurement package but the project manager would ensure the technical information is written. The program manager also ensures the business process dialog occurs between the users and system designers and coordinates any activity with other programs that have an impact or relation to program activity.

Project Manager - The project manager is responsible for development and execution of the task elements of the WBS. The project manager oversees day to day execution of the project and directs personnel in the

accomplishment of tasks. The project manager is responsible for knowing what part of the systems development process the project is in at any time.

Customer/User

The second critical area for common understanding is the difference between customer and user, and the relationship they have in the systems development process. The following diagram shows how the customer needs should be the basis for developing user requirements as part of the SDLC process.



The user processes and output should be clearly defined prior to any automation or enhancement which helps to ensure the output (results) is what the customer is looking for and the automation is user-friendly and an improvement to the process.

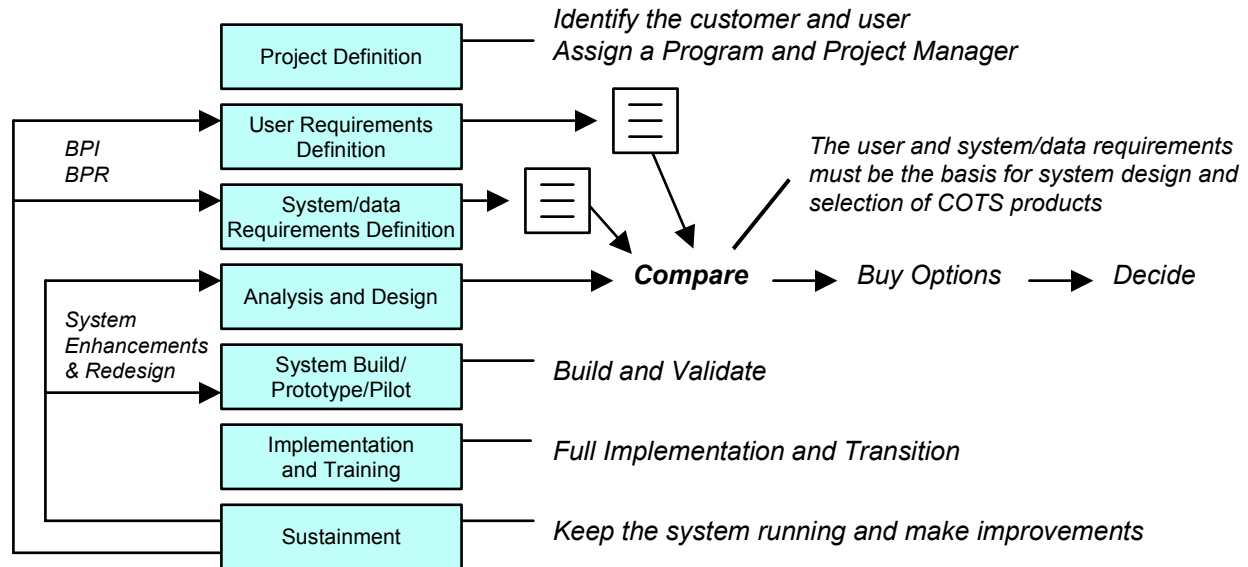
Customer - The customer is the ultimate benefactor of the service or information product. The customer needs should provide the primary influence on how the user constructs their operating concept and business processes.

User - The user (individual or group) that conducts the support processes, or uses the automation technology or system, to produce a service or product for the customer. The user has the key role of identifying the business processes and the areas for possible automation (new system) or enhancement (existing system or support process).

It is important to note that the customer can also be a user such as a Member having access to a hypothetical Web-based finance system to view the status of their pay transactions. The finance group would be the primary user of such an automated finance system that serves the Member customer base. The Member, in addition to getting a paycheck as a customer, would also be a user of the system to “view only” the latest transactions for that Member. This is an example of how the customer and user can be the same individual at times, highlighting the need to ensure that customer needs become the basis for developing user requirements.

2.2 SDLC Process

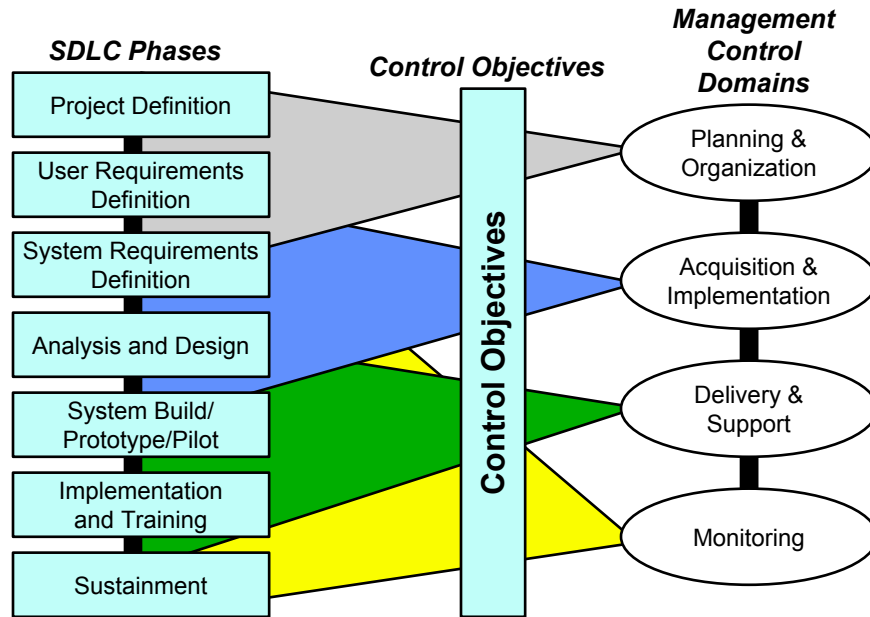
The SDLC process represents a House-wide coordination effort to conduct projects in a structured manner that promotes appropriate analysis necessary for project execution. The SDLC process provides a framework of phases that help track uniquely created tasks for each project. Tasks differ from activities in that they produce specific outputs such as decisions or documents on which further decisions can be made. The overall view of the SDLC process that demonstrates the “decision point” concept is shown as follows:



Each project is assigned a project manager to develop the unique project tasks (the WBS) within each SDLC phase. The project manager shall keep a project notebook that tracks the SDLC status of each project. If contractor resources are used to help execute a project, then a procurement package should be prepared detailing the exact parts of the SDLC process, and the expected work to be performed by the contractor as described in the statement of work. The procurement package should also contain necessary information from previous phases to provide a complete package and generate a comprehensive contractor response. For example, a procurement package for designing and implementing a system should contain the user and system/data requirements or an appropriate requirements summary.

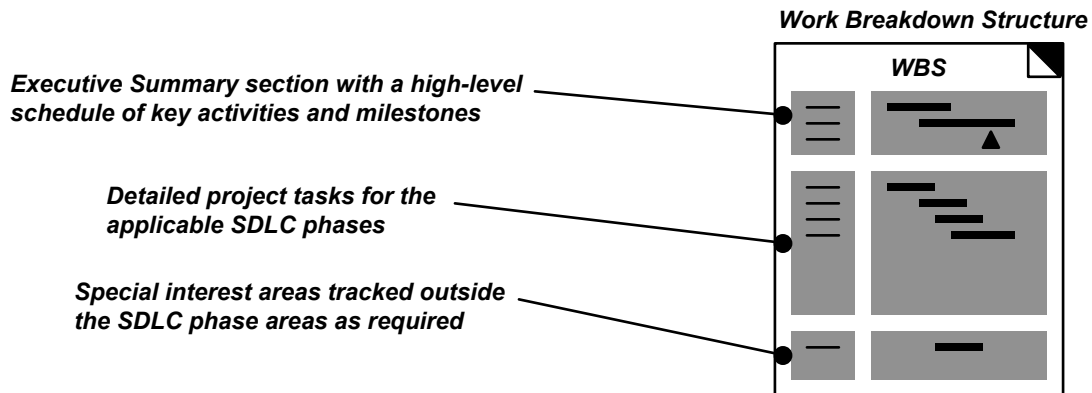
2.3 SDLC Phases with Milestones

The seven SDLC phases serve as a programmatic guide to project activity and provide a flexible but consistent way to conduct projects to a depth matching the scope of the project. Each SDLC phase objectives are described in this section with key deliverables, a description of recommended tasks, and a summary of related control objectives for effective management. It is critical for the project manager to establish and monitor control objectives during each SDLC phase while executing projects. Control objectives help to provide a clear statement of the desired result or purpose and should be used throughout the entire SDLC process. Control objectives can be grouped into major categories (Domains), and relate to the SDLC phases as shown:



SDLC Phases Related to Management Controls

To manage and control an SDLC initiative, each project will be required to establish some degree of a WBS to capture and schedule the work necessary to complete the project. The WBS and all programmatic material should be kept in the “Project Description” section of the project notebook. The WBS format is mostly left to the project manager to establish in a way that best describes the project work. There are some key areas that must be defined in the WBS as part of the SDLC policy. The following diagram describes three key areas that will be addressed in the WBS in a manner established by the project manager.



Work Breakdown Structure (WBS) Organization

The upper section of the WBS should identify the major phases and milestones of the project in a summary fashion. In addition, the upper section should provide an overview of the full scope and timeline of the project and will be part of the initial project description effort leading to project approval. The middle section of the WBS is based on the seven SDLC phases as a guide for WBS task development. The WBS elements should consist of milestones and “tasks” as opposed to “activities” and have a definitive period (usually two weeks or more). Each task must have a measurable output (e.g. document, decision, or analysis). A WBS task may rely on one or more activities (e.g. software engineering, systems engineering) and may require close coordination with other tasks, either internal or external to the project. Any part of the project needing support from contractors should have a SOW written to include the appropriate tasks from the SDLC phases. The development of a SOW does not occur during a specific

phase of SDLC but is developed to include the work from the SDLC process that may be conducted by external resources such as contractors.

Each of the seven SDLC phases is listed below with the basic intent, key deliverables, a description of recommended tasks, and summary points for effective management controls. The SDLC phases should be executed with simultaneous near-term (referred to as Track I) and long-term (referred to as Track II) considerations to ensure continuous support as well as integrated systems development. The deliverables marked with an asterisk are required under this policy to be completed at a level appropriate to the scope of the project. The deliverables without an asterisk, and the tasks listed under each phase, are required for consideration for each project. Any manager at the project manager level and above may assign a non-asterisk deliverable to the project appropriate to the scope of effort. For projects where costs in later phases are difficult to predict, procurements should be broken-up into logical pieces and used as decision points. An appendix provides definition of terms frequently used in the systems environment.

Project Definition

Description: The project definition phase must capture all information necessary to describe the full life-cycle impact of the project at a summary level, and determine if a project warrants the investment of personnel resources and funding. At a minimum, the project definition document must identify the customer, user, mandate, basic operating concept, and provide a preliminary investigation of alternatives (including non-computer-based solutions), a preliminary risk analysis, and a high-level cost-benefit analysis to determine if the project has a favorable return on investment. Project analysis should show the expected cost increase or decrease and the capabilities or benefits gained, and is critical to the project approval process. Smaller projects may be described within 1-2 pages while more comprehensive projects may require a program plan, acquisition plan, or other similar document to describe the project in enough detail to support the planning and approval process. The anticipated program and project manager should be identified with any projected costs for training and sustaining efforts after the project is completed. Project description of the SDLC phases will require estimates for impact or cost, prior to when they can be accurately determined, with subsequent revisions as the SDLC process unfolds. Replacement projects must conduct a BRI/BPR assessment to ensure the replacement effort is not conducted for invalid processes. The key outputs of this phase is knowing what the scope of the project is prior to committing funding and resources, and a formalized approval/authorization or disapproval of the project based on the project definition.

Deliverables: * indicates mandatory documents appropriate to project scope.

*Project Definition Document

*Work Breakdown Structure (top level with schedule)

Customer Interview/Survey Reports (needs analysis)

Alternatives Analysis (may be separate from Project Definition Document for larger projects)

Risk Analysis (may be separate from Project Definition Document for larger projects)

Cost Benefit Analysis (may be separate from Project Definition Document for larger projects)

*BPI/BPR Assessment (for replacement projects)

Technology Evaluations

Program Plan (sometimes called Acquisition Plan)

Project Status Brief

Program Reviews

Major Tasks:

Customer/User Identification – provide a short description of who the customers and users will be as related to the project. Identify whether there is any overlap of the customer participating as a user.

Project Description – provide a description of the project and outline the project purpose and objectives. Provide a simple operating concept diagram as appropriate to describe the project and other related areas or systems. Describe any required BPI/BPR efforts that may be necessary to validate or change the business process prior to automation initiatives.

Customer Interviews – conduct and summarize analysis of customer needs through an interview process. This information becomes the basis for project existence and subsequent user requirements development.

Alternatives Analysis – provides an analysis of alternative approaches, including non-computer-based solutions such as support processes or procedural solutions, that reasonably achieves project objectives.

Risk Analysis – provides a description of internal control and security vulnerabilities, the nature and magnitude of associated threats, and potential for loss or disruption to service. The analysis also includes recommendations for mitigation and safeguards for the identified risks.

Cost/Benefit Analysis – provides a summary analysis of the benefits of the project compared to the cost. May include return on investment analysis identifying the “break-even” point.

High Level WBS/Schedule – provide a summary WBS and schedule (Gantt Chart) of the project phases and major milestones.

Management Controls: The project definition phase should provide a horizontal look at the full project life-cycle at a high level, but address certain key areas in order to manage project efforts within the strategic planning process. Summarized control objectives from the domain of *Planning & Organization* should be continuously reviewed for applicability and include:

- Project relevance to the organizational strategic plan
- Roles and responsibilities of key groups related to the project
- Risk assessment
- Costs/Benefits
- Personnel resources
- Project management
- Communications processes

User Requirements Definition

Description: The user requirements definition phase requires the project manager to conduct a number of tasks leading to the development of a user requirements document. The customer needs will impact how the user

establishes the mission, objectives, and operating concept for the support or service provided to the customer. Developing process flows at both the project level and user level will facilitate selecting the key processes to automate – which constitutes the user requirements. The details of the user requirements (user performance parameters) will be refined throughout the project.

Deliverables: * indicates mandatory documents appropriate to project scope.

**Concept of Operations Document*
Functional Operating Areas Defined
User Interview/Survey Reports
**Functional Requirements*
User (Operational) Process Flows
**User Requirements Document*

Major Tasks:

Concept of Operations – the process of developing drawings and text that describes the high-level activity of the users. This document serves as the basis for user requirements development and outlines the core business process.

Functional Requirements – the core business processes are usually divided into major groupings called Functional Operating Areas (FOA). The primary processes within the FOA grouping are candidates for automation and become the functional requirements. Identification of the functional requirements helps to identify the related technology areas much earlier in the development process and begin technology evaluations.

User Process Flows – the user process flows are developed through process engineering and may require interviews with the user community. The customer needs should have a significant impact on the development of user processes and be fully addressed by the user process.

User Requirements Development – the detailed activity of the user's processes serve as a basis for user requirements development. The user requirements should accurately describe what part of the user processes are candidates for automation or a support process. The user requirements should also include any security requirements and be validated to determine the final set of requirements eligible for the development effort. It is important to note that redundancies and repetitive actions may exist at this point but are documented and will be addressed by the systems engineering activity.

Management Controls: The user requirements definition phase should examine a number of critical areas leading to fully defined user requirements. Summarized control objectives from the domain of *Planning & Organization* that should be continuously reviewed for applicability to the project include:

- Compliance with external requirements
- Risk assessment
- Costs/Benefits
- Defining relationships
- User participation
- Requirements validation
- Communications processes

System/data Requirements Definition

Description: The system/data requirements definition phase is primarily dependent on completion of tasks from the user requirements definition phase. This phase is organized by identifying functional development areas that facilitate technical activity or support cutting across many operational (business) areas. This phase requires systems engineering skills and technical support to combine the user requirements and processes in a way that reduces redundancies, merges repetitive actions, and incorporates technology concepts. A well-defined system process that meets the user requirements is the basis for system/data requirements. The technical requirements will be a sub-set of the system/data requirements and incorporate specifications of existing equipment or systems. The system/data requirements should clearly describe what part of the system process should be automated or enhanced, which helps

promote a solution that meets the needs of many areas (integrated solution). Directly automating or enhancing the *user requirements* may result in isolated systems, compatibility problems, and costly implementation issues. The development of system processes and system/data requirements is the basis for analysis and design.

Deliverables: * indicates mandatory documents appropriate to project scope.

Functional Development Areas

System Process Flow Drawings

*System/data Requirements Document (may include technical requirements)

*Security and Internal Control Plan

*Technical Requirements (mandatory for technology-based projects only)

*Interface Control Document (mandatory for technology-based projects only)

Major Tasks:

System Process Flows – involves development of system processes that combine user requirements and processes. System process flows are usually developed within Functional Development Areas (FDA) which provide a grouping of the anticipated technical activity. The systems approach allows elimination of redundancies and repetitive activities while also incorporating technical concepts or use of automated steps.

System/data Requirements Development – provides information about which system processes should be automated or enhanced (capabilities and features) and identifies the operating environment and technical specifications. System performance parameters and database requirements are examples of information contained in the system requirements. A combination of technical information such as system requirements, database requirements, technical requirements, interface controls, system security, and other information, comprise the system specification.

Interface Control – provides information about areas that must be standardized for data transfer or connectivity to occur between systems. The technical part of interface control is dependent upon knowing where the business processes of related systems overlap or should be integrated.

Management Controls: The system/data requirements, along with the user requirements, provides the critical information for analysis and design. System/data requirements mark the transition from the management control domain of *Planning & Organizing* into *Acquisition & Implementation*. Although planning and organizing continues throughout SDLC, the system/data requirements serve as the basis for determining a solution. A summary of relevant control objectives includes:

- Bound the technology direction
- Identify roles and responsibilities
- Review trade-off analysis
- Acquisition considerations

Analysis and Design

Description: The analysis and design phase is based on reviewing the contents of the user and system/data requirements. The resulting systems engineering effort could range from the selection and configuration of an existing software product to a comprehensive systems development initiative involving software engineering and customization. For non-technical solutions, the design may simply be a support process to be implemented over time. House policy is to seek the use of existing solutions or COTS products and avoid costly software development or customization. The analysis and design process, along with the results of technology evaluations, may prompt an adjustment in the business process (policy or procedures) in order to take advantage of the cost saving of COTS solutions. The most important aspect of this SDLC phase is to provide solution alternatives with trade-off analysis that fit within the House environment and meet the validated requirements.

Deliverables: * indicates mandatory documents appropriate to project scope.

*System Design Document

*System Security and Internal Control Specification

*Detailed Cost-Benefit Analysis (mandatory for technology-based projects only)

Technology Evaluation Reports
Trade-off Analysis

Major Tasks:

System Design – a systems engineering process that uses the results of technology evaluation to develop a solution or support process. The system design is structured to produce capabilities, that when combined with procedures, provides solutions for enhancing performance or a support process. The security and internal control requirements, tailored to the House environment, are also embedded in the design process and provide a combination of technology and procedures to achieve the desired security protection and sound internal control environment.

Design Options – provides two or more design options that gives varying levels of performance for different ranges of cost, build time, and capabilities. Trade-off and cost-benefit analysis provides a means to present these options tailored to the House environment.

Management Controls: The analysis and design phase is primarily covered by the management control domain of *Acquisition & Implementation*. A summary of relevant control objectives includes:

- Feasibility studies
- Comparison and risk reports
- Cost-effective security
- Information architecture
- Relevance to strategic technology goals

System Build/Prototype/Pilot

Description: The system build/prototype/pilot phase is the execution of the approved design and, in cases of a single system, may move directly into the implementation phase. For non-technical solutions, the system build may involve creation of a support process and move directly to implementation. Initial procurement activity is conducted to stage a system build prior to deployment during implementation. The prototype or pilot concept provides a good opportunity to determine technical feasibility prior to a large investment of funding and resources. User and system testing can also be conducted in this phase and is covered in more detail in the implementation and training phase. The system build will also serve as an interim step prior to deployment of a system to ensure minimal disruption during the deployment. The system build/prototype/pilot phase also serves as a means to collect feedback and make refinements or adjustments prior to full deployment.

Deliverables: * indicates mandatory documents appropriate to project scope.

**Prototype/Pilot Report*

**Validation, Verification, and Test Plan (mandatory for technology-based projects only)*

**Completed System Validation Report (establishes system built to specification)*

Security Evaluation Report

Major Tasks:

System Build – provides a controlled environment to conduct procurement, receiving, staging, configuration, and other build-out activities on a smaller scale. The build-out process also allows validation of vendor equipment and testing within a controlled environment prior to deployment in a production mode.

Validation, Verification, and Testing – testing should be conducted according to the plan and conclusively demonstrate that both the user and system requirements have been met. Independent validation and verification should be used for more comprehensive projects and appropriate reports created.

Management Controls: The system build/prototype/pilot phase consists primarily of structured processes to meet the approved system design. The management control domain of *Acquisition & Implementation* encompasses this SDLC phase. A summary of relevant control objectives includes:

- Feasibility studies

- Technology evaluations
- Development procedures
- Documentation procedures
- System software security

Implementation and Training

Description: The implementation and training phase marks the beginning of approved procurement to install the system or support process for actual use. For non-technical solutions, implementation may be limited to a new support process requiring a change in the business process. In cases when a prototype or pilot project is used, the implementation may simply be a larger scale deployment of a proven solution. In cases when a single system is being developed, the implementation may include significant integration activity and configuration during the implementation process. For replacement systems or significant upgrades, data conversion may be required and will be conducted according to the implementation plan and verified through system/data testing. The House environment requires transition of new or replacement systems to be done with minimal disruption to daily House activity. Parallel operations and advance training is critical to ensure continuity of services. Testing should be conducted both for user acceptance and system specification. Operational Test and Evaluation (OT&E) is commonly used to ensure the system performs as the user expects and in compliance with the user requirements. Developmental Test and Evaluation (DT&E) is a type of testing done to ensure compliance with the system requirements and specifications. DT&E also ensures that system integration is acceptable and stress testing is within system specifications. The final stage of implementation also includes completion of documentation such as user manuals, system drawings, operations manuals, and Standard Operating Procedures (SOP).

Deliverables: * indicates mandatory documents appropriate to project scope.

**Implementation Plan*

**Validation, Verification and Testing Plan (may be in implementation plan for small projects)*

**System Documentation (the "as built" document)*

Interface Control Document updates

**Test Analysis Report (should include security testing analysis)*

**User Acceptance or System Accreditation Document/Report*

Procurement Plan (sometimes called acquisition plan)

Transition Plan (sometimes called "cut-over plan")

**Training Plan (may be included in implementation plan for small projects)*

User Manuals

Major Tasks:

Implementation – development and processing of all required documents (e.g., purchase orders) to procure equipment or services to deploy the system or support process. Additional activities may include staging, integration, configuration, and installation.

Training – training should be conducted according to the training plan and provide a "self sustaining" capability to the House. The training curriculum should support users as well as instructors to ensure new users are afforded an immediate and continuous training opportunity.

Documentation – the process of formally recording information about the configuration of the system and the procedures for using the system or support process to solve problems and enhance operations. Typical documents include user manuals, operations manuals, systems guides, interface control documents, and maintenance guides.

Validation, Verification and Testing – testing should be conducted according to the plan and conclusively demonstrate that both the user and system requirements have been met. Independent validation and verification should be used for more comprehensive projects and appropriate report created to document results.

System Accreditation – final acceptance of the system is formalized through the system accreditation process, which provides acknowledgment that the user and system/data requirements have been met. The results of security evaluation and analysis are included in this area and must be acceptable in order to complete system accreditation.

Management Controls: The implementation and training phase requires diligent monitoring of all activities contributing to system deployment. The primary management control domains related to this SDLC phase are *Acquisition & Implementation*, and *Delivery & Support*. Summarized control objectives for the deployment and training process to be continuously reviewed for applicability to the project include:

- Process and methods for IT acquisition
- Installation procedures
- Change management procedures
- Validation, verification, and testing strategy/procedures
- Process monitoring

Sustainment

Description: The project sustainment phase is dedicated to keeping the systems or support processes operating to provide service to the customer or user. For non-technical solutions, sustainment may be the continuation of a support process. Sustainment projects will include periodic proactive actions identified in the WBS. Technology reviews for enhancements or updates to the software and hardware will also be conducted. An enhancement or redesign may not change the business process but should not be undertaken unless the current business process is validated. There should also be periodic reviews of the business process, which may lead to either an improvement or reengineering effort. The *Project Status Review* should also contain after action reviews for project transition into the sustainment phase. Performance measures of the sustainment process will help identify when actions or additional projects should be initiated. Change management and quality assurance is also required in this phase to ensure thorough and accurate documentation of the system configuration.

Deliverables: * indicates mandatory documents appropriate to project scope.

**Performance Measures Documentation*

**Program Status Reviews (includes after action review for transition to sustainment)*

**Configuration Management Documentation*

**Change Management Documentation*

BPI/BPR Reports

Technology Enhancement Reviews

Major Tasks:

Sustainment Activity – conduct maintenance and service activity to keep the system operational. This includes response to system failures and notification to users through the system alert process. Activity also includes proactive and preventive actions that help keep the system from failing. Maintaining updated documentation of the system configuration is required by this policy and begins at the project definition phase. Another key element is the control of change to the system through strong enforcement of change management and quality assurance controls.

Business Process Reviews – conduct a review of the business processes representing the way the users operate under the current policy and procedures. Any revisions or reengineering in this area may have a tremendous impact on user requirements and current system design or support processes. A BPI/BPR assessment should be performed for any replacement project initiative, which leads back to the first phase of SDLC.

System Reviews – conduct periodic reviews of the system to ensure operating health and that software updates or enhancements are tested and installed. New technology may result in a technology upgrade that improves automation of the current business process.

Management Controls: The sustainment phase is dedicated to maintaining systems, service, or support at optimum levels. Control objectives related to this SDLC phase overlap from management control domains of *Delivery & Support*, and *Monitoring*. Summarized control objectives for monitoring the development or support process, and sustainment of the system, that should be continuously reviewed for applicability to the project include:

- Change Management

- Independent quality assurance
- External reviews
- Process monitoring through Program Status Reviews
- Review of system and security operations

Appendix A

INFORMATION RESOURCES MANAGEMENT ADVISORY COUNCIL CHARTER

The attached charter for the Information Management Advisory Council (IRMAC) is provided as required by the CAO roles and responsibilities section of the SDLC policy.

Information Resources Management Advisory Council Charter

1. Purpose

The Information Resources Management Advisory Council (IRMAC) is established to coordinate information resources planning, acquisition, development, and use within the Office of the Chief Administrative Officer and other appropriate organizations within the House community.

2. Background

Information Resources Management (IRM) is the management of information through its entire life cycle ranging from the methods of recording it, storing it, and transmitting it, to the decisions of archiving or destroying it. As an objective, IRM encompasses providing the right information at the right time, in the right place, on appropriate media, efficiently and at low cost, for use in making decisions, followed by destruction or archival retention. The efficient use of information resources is a primary concern of the Chief Administrative Officer. IRMAC is to provide for the efficient and effective management of information resources, institute cooperative actions to standardize and improve the use of Information Technology (IT), telecommunications and provide an organizational means for communication among the various House components on technological subject matter.

3. Establishment of the Council

IRMAC is composed of the Chief Administrative Officer, Associate Administrators for House Information Resources, serving as Chairperson, Office of Human Resources, Media and Support Services, Office of Finance, Office of Procurement and Purchasing, and Administrative Counsel. Participation is also open to other House offices. The Office of the Inspector General shall serve on the IRMAC in an advisory capacity. A staff member from HIR will provide administrative services and technical support for the IRMAC, as required.

4. Council Responsibilities

IRMAC will meet quarterly to consider and coordinate action at the senior management level with respect to information resources programs, progress, and problems, and will serve as a forum to address intra-Office issues. IRMAC may also establish subcommittees or work groups to address those issues. Examples of IRM concerns are as follows:

- (a) Data standardization policy and management.
- (b) System Development Life Cycle (SDLC) and Quality Assurance.
- (c) Federal information processing standards and industry best practices for IT and telecommunications.
- (d) IT and telecommunications requirements, configurations and interoperability.
- (e) Privacy and security of systems, data, and facilities.
- (f) IT and telecommunications management, planning and budgeting.
- (g) Mission implications of new hardware and software technology.
- (h) Computer-based office automation systems.
- (i) IT and telecommunications technology sharing.

5. Authority

IRMAC will serve as a consultative and coordination body to the CAO. IRMAC, as a result of examination of issues affecting IRM, is to:

- (a) Recommend IRM policies, standards and guidelines to foster user buy-in and acceptance of the Chief Administrative Officer's IRM program;
- (b) Recommend priorities for the Chief Administrative Officer's IRM program initiatives (e.g., the acquisition and development of IT and telecommunications resources); and
- (c) Recommend actions needed to address the progress of or problems in the implementation of the Chief Administrative Officer's IRM program.

6. Relationship to the CAO Technology Coordination Task Force (TCTF)

The IRMAC provides a high-level advisory role and focuses on applying management/technical concepts based on policy, experience and the perspective of the CAO environment. The TCTF role is chartered to be execution oriented (day-to-day activity) and focuses on development or implementation of concepts in response to its technical advisory role. As such, the two teams will require continual coordination of activity and interaction.

The IRMAC is open to participation by other House offices and includes the CAO AA's, CAO General Counsel, and the OIG in an advisory role (OIG is not on the TCTF). The IRMAC role is much more strategic in nature and would not engage in day-to-day activities that the TCTF is established to handle, such as scheduling a vendor to brief the group for a project review, with discussions of process flows and requirements. Likewise, reviewing the details of Web-based Procurement Desktop and the best technical direction would be a TCTF rather than an IRMAC activity. The IRMAC would, however, review a TCTF recommendation concerning a project to ensure it fits within the goals and objectives of the House community for technical development. Although many of the TCTF and IRMAC members are the same, their roles differ significantly between strategic and operational roles of the two groups. The TCTF will be more likely to substitute, or include, a representative for an AA concerning technical matters. Both are required to prompt technical activity to completion within desired goals and objectives of the House community.

Appendix B

TECHNOLOGY COORDINATION TASK FORCE CHARTER

The attached charter for the Technology Coordination Task Force (TCTF) is provided as required by the CAO roles and responsibilities section of the SDLC policy.

Technology Coordination Task Force Charter

1. Purpose

It is essential that the House have a strategic, planned approach to the technological issues facing it. It is the purpose of the Technology Coordination Task Force (TCTF) to provide for the development, deployment, and monitoring of CAO information technologies and to facilitate coordination of efforts with other offices of the House and the legislative branch to the extent possible.

To this end the TCTF will develop and recommend to the CAO strategic objectives for deployment of inter-operable technological resources within the House.

It shall be the responsibility of the TCTF to assess the deployment of the technological resources within the CAO, taking into account the other offices of the House and other legislative offices to the extent possible, and make recommendations to the CAO based on its assessment in conjunction with the adopted strategic objectives. In making its assessments the TCTF will insure that interested parties, including users, are involved as an essential component in developing recommendations to the CAO.

It shall be the further responsibility of the TCTF to monitor deployed technological systems within the House to ensure they continue to be in compliance with the strategic objectives.

The TCTF shall have as one of its key responsibilities oversight of the Year 2000 Project and coordination of CAO technological developments within that project.

The TCTF will also provide advice to the CAO on any other technology issue the CAO may request.

2. Responsibilities

In the fulfillment of its purpose the TCTF shall:

- 1) Develop strategic objectives for deployment of information technology within the House that include but are not limited to, the following:
 - a) Inter-operability of software systems within the CAO and whenever possible the other offices of the House as well as other legislative branch offices
 - b) compliance with Year 2000 Project requirements
 - c) participation of the responsible offices in the assessment of needs and compliance of the technology with those needs
 - d) setting of requirements for the implementation of technological projects within the CAO such that the strategic objectives can be met within acceptable time frames

The strategic objectives will be comprehensive and long term in scope.

- 2) Develop and recommend to the CAO procedures for implementation of the House's SDLC policy.
- 3) Set priorities when necessary for implementation of technological tools, where the priorities are in conformation with the strategic objectives.
- 4) Develop and recommend to the CAO procedures for monitoring deployment of CAO technological systems so that the strategic objectives and SDLC requirements are met in the deployment.

- 5) Develop and recommend to the CAO procedures for monitoring deployed CAO technology systems. Deployed systems are to be monitored in order to recommend, when necessary, steps for continued compliance with the stated strategic objectives of the House in regards to technological deployment.

3. Structure

The TCTF is comprised of:

A representative of the CAO

The Associate Administrator and a technical representative from each of the following CAO organizations:

- Finance Office
- House Information Resources
- Human Resources
- Media and Support Services
- Procurement and Purchasing

Year 2000 Project Manager

The TCTF will report directly to the CAO. The Associate Administrator of House Information Resources shall chair it.

The TCTF may from time to time consult with and engage in their deliberations with representatives of the other offices of the House, the legislative branch, and other external organizations, as it finds useful.

4. Meetings and Reports

The TCTF will meet twice a month until the completion of the Year 2000 Project, after which it will meet monthly. It may also meet any other times that it finds necessary.

Administrative functions shall be performed by Year 2000 Project Manager or a substitute designated by the TCTF chairman.

The TCTF will present the CAO with a formal report on a quarterly basis and will report at other intervals to the CAO as either the CAO or the TCTF finds useful. It will submit minutes of its regular meetings with attachments including reports it has received, including, but not limited to regular reports from the Year 2000 Project Manager. The quarterly report shall include a summary of its accomplished tasks and a status report of outstanding issues.

Appendix C**SDLC TERMS AND DEFINITIONS**

This appendix provides definitions of terms related to the systems development environment:

Activity: A state of being active or performing an operational, system, or methodology process.

Business Process: A term used to describe the daily activity of an organization or group to conduct operations. The business process does not outline technical solutions but focuses on the operational process to which technology or improvement could be applied.

Business Process Improvement: An effort to improve the operational or system activity (process) within the defined operating concept of the organization.

Business Process Reengineering: An effort to redesign or recreate the operational or system process due to a significant change in the operating concept of the organization.

Concept of Operations (CONOPS): A combination of drawings and text describing the primary areas and conceptual methods of an organization conducting activities and operations.

Cost/Benefit: A comparison of the old/new expenditures to the old/new benefits derived from completion of the project. The Return on Investment (ROI) analysis usually defines the time period required to reach the more favorable situation.

Customer: The customer is the ultimate benefactor of the service or information product. The customer needs should provide the primary influence on how the user constructs their operating concept and business processes.

Developmental Test and Evaluation (DT&E): A term used to describe testing a system for compliance with the system and technical requirements and determining that the system was built to proper specifications.

Life-Cycle: Refers to the entire period of activity in transforming customer needs into system or support solutions and sustaining activities.

Management Controls: A comprehensive checklist of control objectives used by business process owners to ensure thorough and coordinated execution of the systems development life-cycle.

Methodology: A structured approach using rules, procedures, and discipline to achieve desired results and consistency in execution.

Operational Test and Evaluation (OT&E): A term used to describe testing a system for compliance to user (operational) requirements and determining that the system meets the users performance expectation.

Phases: A clustering of tasks and activities that describes a functional area of the SDLC process.

Policy: A high-level overall plan embracing the general goals and acceptable procedures – especially of a governmental body (*Webster's*).

Process Flow: A drawing that shows the flow of processes or activities without focusing on technical design or solutions.

Project: A planned undertaking within a specified time period and usually consisting of many tasks and activities.

Prototype/Pilot: A scaled-down version of a support process or system that demonstrates “proof-of-concept” for a minimal cost, and prior to committing funds for large-scale deployment.

Requirement: Describes a part of a process to be automated or enhanced in terms of capabilities and features. This is a vague term until modified with the requirements type such as user, functional, system, or technical. Various requirement types include:

Data – a description of what data elements are required to conduct information processing and where they exist within the system process. Information access and sharing requirements are usually included.

Functional – a high-level description of what processes of the operating concept are to be automated or enhanced. Usually grouped into functional operating areas.

Operational – a description of what part of the operational (user) process should be automated or enhanced (interchangeable with user).

System – a description of what parts of the system process, after eliminating redundancies and repetitive actions, should be automated or enhanced (includes existing system).

Technical – a description of the specifications, ranges, protocols, or other technical information, including the existing system, that bounds the design process.

User – a description of what part of the user (operational) process should be automated or enhanced (interchangeable with operational).

Statement of Work (SOW): A listing of tasks that describe the work necessary to develop and implement a support process or system meeting the objectives of the project.

Sub-system: A smaller functional area of a system that can be analyzed or modified but has an impact on the overall system.

Systems Development: A methodical approach to identifying needs and process-based requirements, and using a structured process to design and implement solutions.

Systems Engineering: A practice of analyzing and developing systems-based solutions throughout the life-cycle process or on designated sub-systems.

System Enhancement: An adjustment to the support process or technical improvements to the existing system such as updated equipment or software (the business process could remain the same).

System Process Flow: A drawing that combines user (operational) process flows with technology concepts (not design) to reduce redundancies and repetitive actions.

System Redesign: A significant change in the support process or system technical components due to advancements in technology or changes in the business process.

Task: A piece of work to be completed within a specified time period and with measurable results. An example of measurable results includes documents, software, products, decisions, or analysis.

Technology Evaluations: A task to review technologies relevant to the selected business processes to assist requirements development and the design process

Track I: A term referring to near-term initiatives, in parallel with long-term efforts that provides immediate capabilities for House operations. Track I initiatives are conducted with respect to the planned long-term efforts.

Track II: A term referring to long-term initiatives to develop integrated systems or support processes and evolves from “lessons learned” during Track I operations. Track II initiatives are conducted in parallel with Track I and closely coordinated to maximize integration and cost reduction.

User: The user (individual or group) that conducts the support processes, or uses the automation technology or system, to produce a service or product for the customer. The users have the key role for identifying the business processes and the areas for possible automation (new system) or enhancement (existing system or support process).

User Process Flow: A drawing that describes the operational activity (business process) in accomplishing the objectives and mission of the individual or group within the organization.

Work Breakdown Structure (WBS): A listing of tasks required to be accomplished in order to achieve success for a given project.