A common core – ITIL Version 3.0 and CMMi-SVC

WHITE PAPER

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Abstract

The objective of this paper is to establish an analogy between the Information Technology Infrastructure Library (ITIL) version 3.0 and the Capability Maturity Model for Services (CMMi-SVC). The Version 3 of ITIL was released on May 30, 2007. ITIL V3 focuses on Service Life Cycle which was missing in ITIL V2. Underlying support for life cycle as described in ITIL version 3.0 becomes the binding element of the two models, ITIL V3 and CMMi-SVC. This paper initially describes how CMMi-SVC was evolved out of CMMi maturity model for software development. Later it goes on to compare the ITIL version 3.0 and CMMi-SVC by bringing out the common core across the two models. Life cycle being a common core across software development and service bridges the gap between the "build" and "run" areas.

By establishing a mapping of CMMi-SVC and ITIL Version 3.0, research and development activities in the respective fields can be better coordinated. Going forward, maturity model constructs can be cross leveraged and a maturity model for services which reflects the best practices from both the disciplines would be a definite outcome. Coordinated research effort is bound to result in a wider acceptance and adoption of the above frameworks by practitioners, with an ultimate business benefit.

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1. BACKGROUND

A maturity model is a system for measuring the process maturity of an organization. It includes indicators that show evidence of capabilities. Using the maturity model, process capabilities of an organization are documented on a known, objective scale. CMMi is de-facto standard for maturity models for Software Engineering processes. For IT services, industry standard maturity models such as CMMi-SVC and ITSMF are evolving.

Carnegie Mellon Software Engineering Institute (SEI) has released CMMi (Capability maturity model Integrated) version 1.2. The maturity model framework has three constellations –

- CMMi-DEV for development or engineering processes;
- CMMi-SVC for services; (Services constellation model is under development.)
- CMMi-ACQ, model for acquisition.

CMMi provides the framework and guidelines to evaluate and create quality processes and guides an organization to select processes which can best suit their needs. ITIL uses best practices to create well defined process for IT Service Management. ITIL Version 3.0 released in May 07 has introduced the service life cycle concept for the first time. Service life cycle support has been made very explicit.

2. Introduction

The primary objective to write this paper is to give the reader a high level overview comparison between CMMi-SVC model and ITIL version 3.0. The intended audiences of this paper are the research and development teams of the two models viz. CMMi-SVC and ITIL version 3.0 CMMi.

The overview comparison is made by establishing the fact that both the models inherently support service life cycle. Further, the manner in which process infrastructure in both the models is aligned to support the life cycle also has significant commonalities. It is the objective of this paper to compare and contrast the process infrastructure these two models provide. This paper develops an understanding of the concept of an overall process framework. The significance of “core” and “non-core” process areas and support infrastructure is first established. This understanding is developed by establishing parallels between CMMi-SVC and ITIL version 3.0. The core and non-core process infrastructure blocks of the two frameworks are then compared. Thus, the analogy is established between the process blocks.

This concept would help the research committees developing these two models in various ways, some of them being,

1. The research efforts pursued for the two models could be synergized. Best practices from both the frameworks can be shared and thus, each model can become more complete.

2. A maturity model which includes the best practices from both the models can be developed. CMMi model and its maturity levels have become de-facto standards; these maturity levels can then be interpreted in an ITIL context.
3. This will lead to wider adoption of both the models. Both these models are in their initial stages. This will help build credibility to the efforts spent so far and hence, have increased adoption by the business users.

Subsequent sections elaborate and describe the comparisons in more detail and establish this analogy. An introduction to the CMMi Model is provided in next section; life cycle support for CMMi is also demonstrated. Similarly ITIL version 3.0 is introduced in a later section; life cycle support for ITIL is discussed and the thread is carried forward by comparing and contrasting ITIL V3 with CMMi-SVC life cycle representation.

3. CMMi Model

The CMMi Version 1.2 has sixteen core processes which are common to all three constellations. A brief snapshot of CMMi Version 1.2 model is as shown in figure 1. The sixteen common process areas across the three constellations are mainly from project management, process management and support process groups. The sixteen common process areas contribute significantly to the maturity model. For e.g. project management processes contribute significantly for a Level 2 maturity which is termed as “managed”; process management contribute significantly for Level 3 maturity which is termed as “defined” and so on. This provides an explanation of a common maturity model for all the three constellations.

Process areas introduced in CMM-SVC model are related to delivering and supporting services. Optional process areas for services include Organizational service management, Service systems and design and service continuity management. These are termed as optional for an organization which has a basic CMMi process framework.

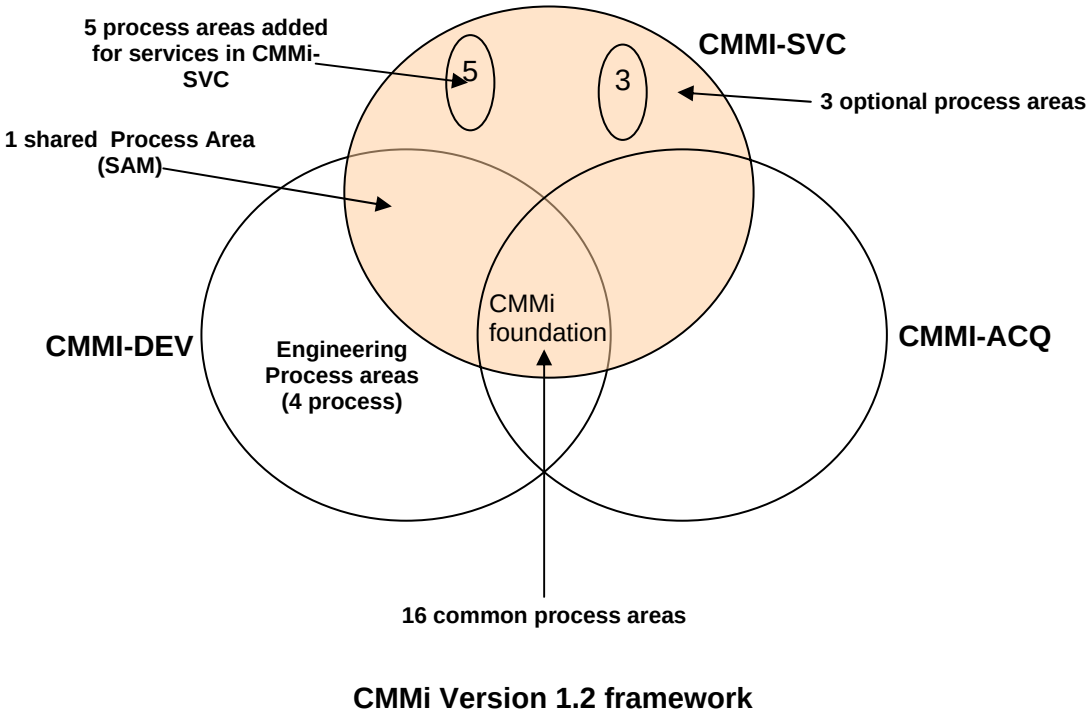

Figure 1: CMMi V1.2 model across 3 constellations [1]

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Understanding Services in a CMMi context

It is important to draw a parlance or identify similarities between Services and Software Engineering in order to enhance the understanding of applicability of CMMi for Services. While a level 3 maturity indicates an organization wide ability to deliver projects in a consistent manner, in a services context it can be described as an ability of an IT Services organization to deliver a consistent quality of services for all the services in its service portfolio across all locations.

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Project-Service Parlance

A CMMi Development model is designed for a project-mode based execution for Development and Engineering. Development projects are executed in an IT organization. Designs, engineering resources and capabilities are organized as projects to deliver a functional product or an engineering component. Similarly, IT Service organizations organize their capabilities and resources or service assets into services. For example, Requirements Management and Development in a CMMi development model can be compared to eliciting requirements and defining Service Level Agreements in services context.

[1] www.dtic.mil/ndia/2006cmmi/wednesday/**3D5_Hollenbach**.pdf

Life cycle Approach

A CMMi development model has process areas which addresses the complete Software Development Life Cycle. The processes are grouped as follows:

- ❖ Project Management - Process areas present in this process group are focused on project management aspects.
- ❖ Process Management – Process areas in this group contribute to the process infrastructure which ensure in repeatable and predictable services.
- ❖ Software Engineering – Process areas in this group are responsible for the engineering and design of the software components and products.
- ❖ Support Process – These processes also contribute to the process infrastructure which facilitates software delivery.

Process areas grouped in this manner; do not intuitively explain how life cycle concept is supported. Hence, one has to rearrange the process areas as explained in figure 2.

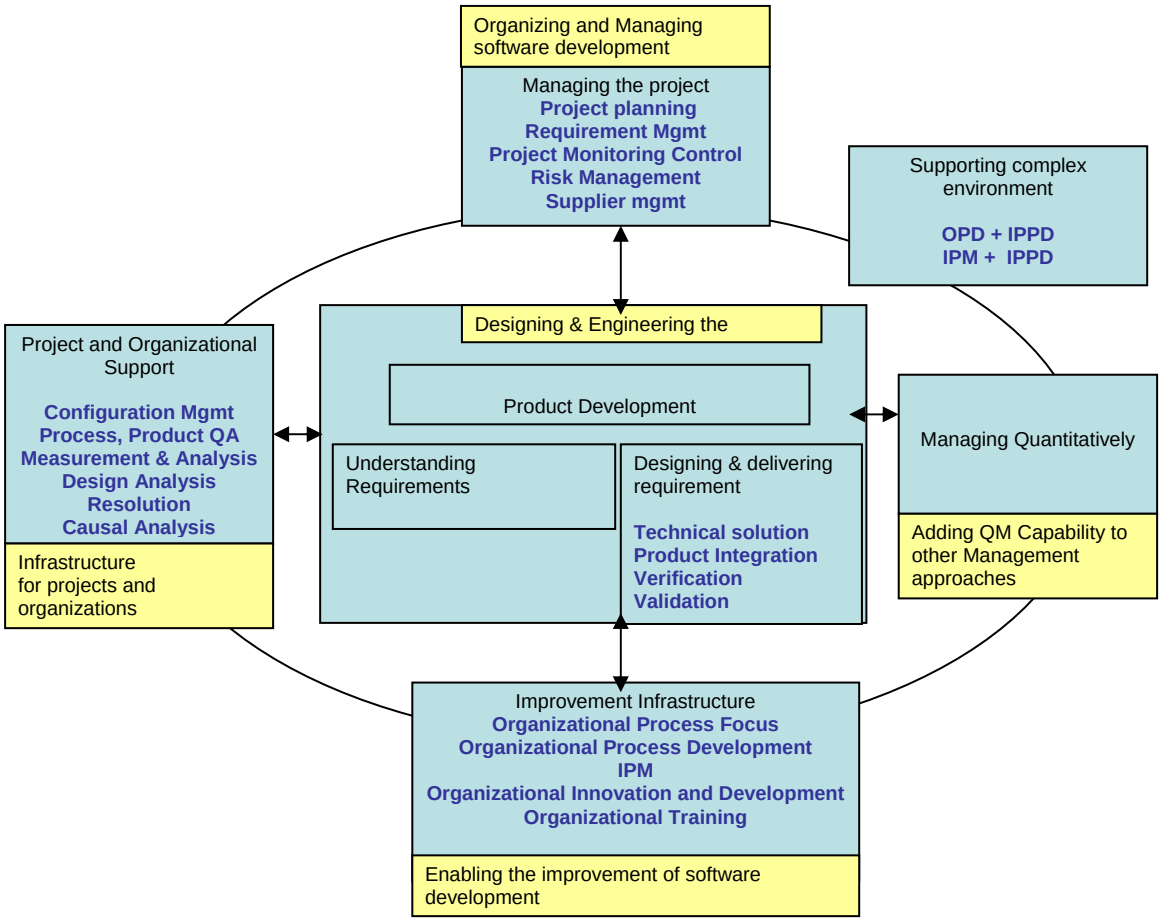

Figure 2: CMMi – Core and Non-Core process areas

The ”CORE” of software life cycle development module is carried out by process areas in the central block, the box titled “Design and engineering the software”. This involves designing requirements, implementing them and testing them. The peripheral process areas which can be considered as non-core, contribute to the process infrastructure within which the software development activity is carried out. The core process blocks are titled “understanding requirements” and “designing and delivering requirement”. Following are the non-core process blocks.

1. Infrastructure for Projects and Organizational support
2. Enabling the Improvement of Software Development
3. Managing Quantitatively – QM capability to other management approaches
4. Supporting Complex Environment
5. Organizing and managing software development.

Introducing CMMi-SVC process model

The Figure 3, below is an extension to figure 2 and has additional process areas defined which are specific to IT services. Note that process areas for designing and delivering software are not present in the services framework model.

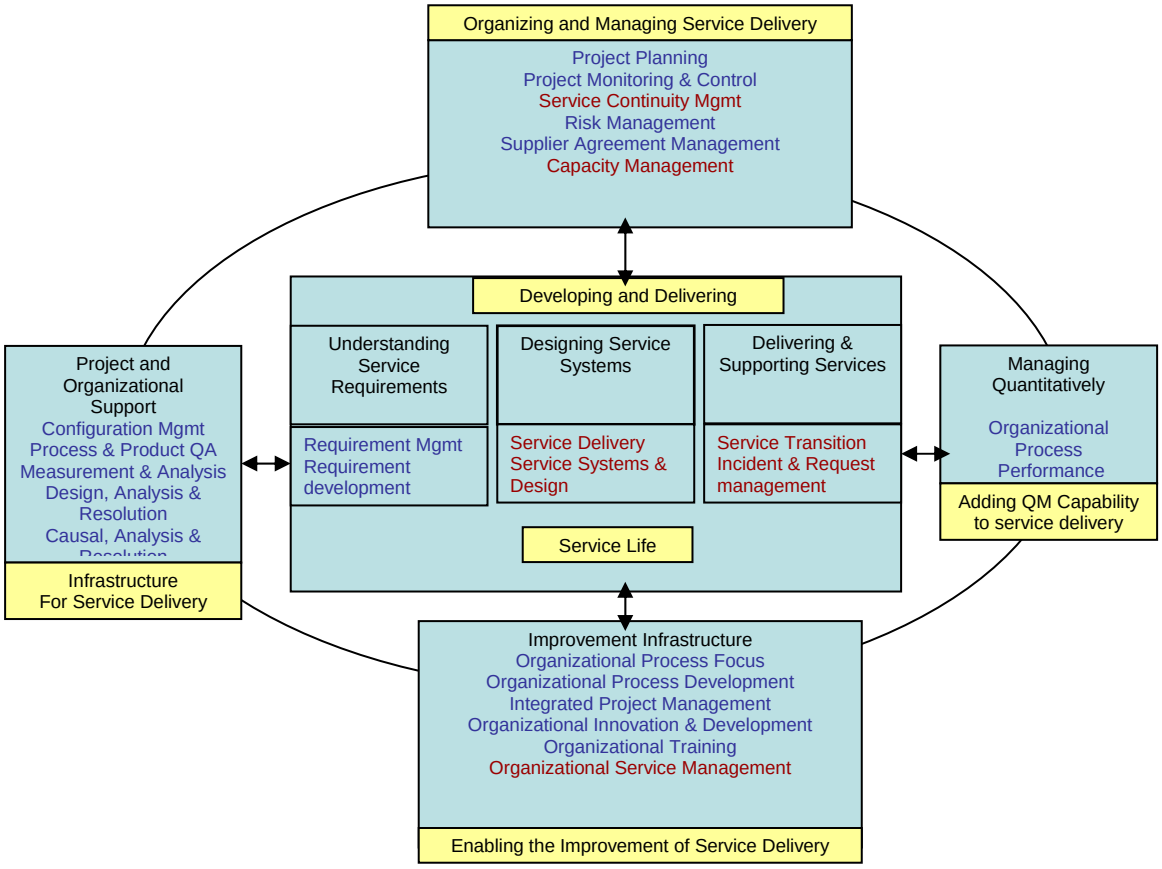

Figure 3: Introducing Service process areas in CMMi-SVC framework (life cycle model)

The Figure 3, above indicates how the additional process areas introduced contribute to the Service Delivery Systems. Engineering process areas in CMMi-DEV model are not present in CMMi-SVC.

Referring to the central block, Service Delivery process area contributes to the "Design" of Service Delivery Systems. Service System and Design is an optional process area and also contributes to the "Design" of Service Delivery Systems. Service Transition and Incident and Request Management enable "Delivering and Supporting" the services. The Requirement Management and Requirement Development process areas remain the same for both the models. The Requirement Management module in CMMi-SVC should however support soliciting the functional, implicit requirements in addition to the service level agreements. Service Delivery Systems are designed to implement the requirements

Process infrastructure surrounding the service life cycle block (central block titled "Developing and Delivering Systems") supports this entire life cycle. The support process infrastructure is similar to the CMMi-development model. Some of the inclusions in CMMi-SVC which strengthen the support infrastructure are included in the respective functional blocks. For example Problem management does a causal analysis on issues reported, provides capability to anticipate issues, thus strengthening the organization wide processes to resolve problems and hence is included in the "Infrastructure for service delivery" functional block.

Similarly, processes like Capacity Management, Service Continuity Management, Availability Management are grouped under the functional block "Organizing and Managing Service Delivery". For e.g. Service Continuity Management (SCM) process area deals with risk contingency to minimize business disruptions occurring from outages. As these process areas are in line with the spirit of project management, they are included in the "Organizing and Managing Service Delivery".

Organizational Service Management (OSM) enhances the organizational process infrastructure by maintaining standardized processes. This process area enhances customer feedback processes and acts on feedback. It is a repository for all services (past and present) that the service organization has. Hence, OSM contributes towards "Enabling the Improvement of Service Delivery". Quantitative process management which deals with collecting performance data and derive key results from them based on statistical analysis, remains the same for services.

4. ITIL V3.0 framework for IT operations

ITIL version 3.0 has grouped IT service activity into 5 phases of a service life cycle viz. Service Strategy, Service Design, Service Transition, Service Operation and Continuous Service Improvement. This is illustrated in Figure 4, below.

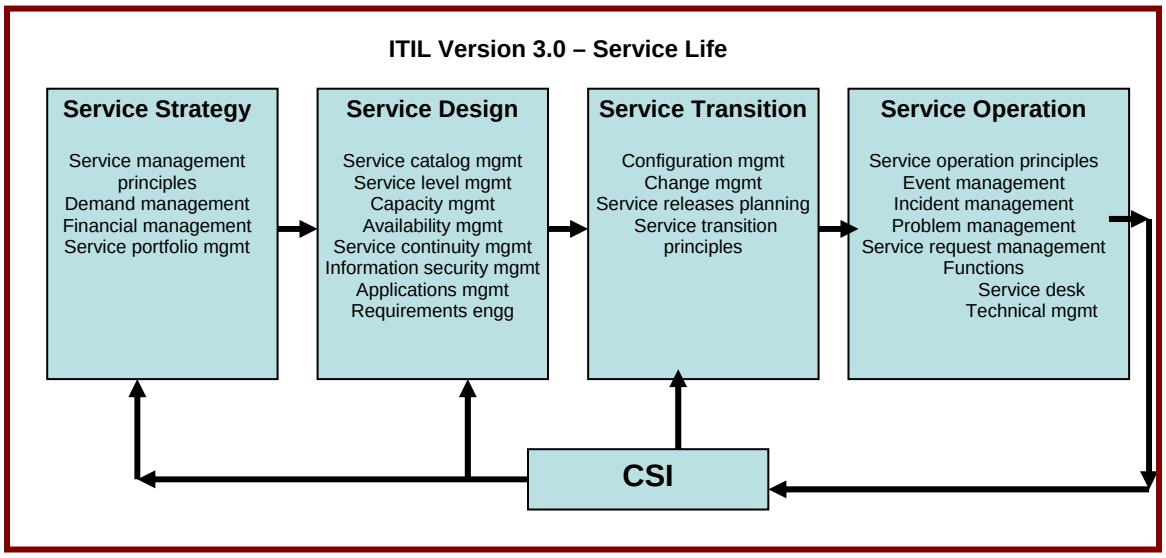

Figure 4: ITIL V3.0 service life cycle

Each of the service life cycle phases is described as follows.

- Service Strategy: This is the strategy formulation phase which defines the manner in which Service Systems should be designed and service value created. It focuses on Service strategy formulation and Service value creation principles which have to be incorporated through out the Service Life Cycle. The process phase focuses on aligning the IT strategy to the overall business strategy. It derives the "so what" implications on IT Service System design from business imperatives and expectations. Financial measures are addressed; and cost of delivering services is decided. The exact type and capacity of services to be delivered is addressed. This generally takes the form of a service portfolio. A service portfolio becomes a tangible input to the next phase.

- Service Design: This phase involves designing of Service Systems. Service catalogues are prepared; required resources are made available for designing and implementing the Service System. Services are designed in this phase as per the SLAs designed. Service Delivery Systems are designed for all as per customer expectations. Information security, service continuity management, Capacity management, service level management, service catalog management, application management and requirements engineering processes are addressed as part of service design.

- Service Transition: This phase involves delivering the services to the customers. The main intent of the transition is to regulate new software releases or applications into the production environment. In this process area, change management ensures financially viable and practical change requests are tracked to completion. Release management ensures a seamless, uninterrupted release of Service Delivery Systems to users or customers. A configuration management process relies on a configuration management database which acts as an organization wide asset base.

- Service Operations: This phase involves supporting the services; it involves issue resolutions and service support to the business organizations. Service operations involve a very high customer contact. The degree of customer contact greatly influences the service operations processes.

Identifying Core and Non-Core process areas

The concept of what contributes to service utility[2] and what contributes to service warranty[3] can be used to differentiate between core and non-core process areas. Core processes are considered to be part of the service life cycle and result in service utility value which is tangible. Service life cycle addresses "what is the service delivered to the customer?" Non-core processes are considered to be supporting process infrastructure which results in service warranty value. Service warranty addresses "how is service delivered to the customer". Warranty attributes ensure reliable and predictable service. Having introduced this concept of core and non-core, we can now split figure 4 into core and non-core activities as shown in figure 5. All core activities are retained within the central service life cycle block whereas non-core process areas are taken out. Non core process areas contributing to process infrastructure are further elaborated in Table 1, below

[2] Service utility is tangible outcome of a service for which the customer pays
[3] Service Warranty are the intangible attributes associated with service outcome that customer pays for.

Process group	Non-Core process area	What does it signify	Support infrastructure block
Service Strategy	Service management principles	Ensures a standard approach to creating, delivering and supporting services	Contributes to organization infrastructure thus enabling *improvement* of overall Service Delivery Systems
	Demand management	Design of delivering systems, planning for desired capability	Organizing and managing the Service Delivery Systems
	Financial management	Financial control on resources required for delivering services; appropriate collection & reporting of financial data.	Capability to quantitatively manage the costs involved and take appropriate corrective action
Service Design	Capacity management	Proper allocation of resources to ensure services are delivered to the customers	Organizing and managing the Service Delivery Systems
	Availability management	Ensure appropriate design of Service Delivery Systems so that service is available to customers when required	Organizing and managing the Service Delivery Systems
	Information security management	Ensures data confidentiality, integrity and availability	Organizing and managing the Service Delivery Systems
	Service continuity management	Minimizes business disruption owing to IT impacts	Organizing and managing the Service Delivery Systems
Service Transition	Service transition principles	Ensures a standard approach to a seamless introduction of services in production environment	Contributes to organization infrastructure thus enabling improvement of overall Service Delivery Systems
	Configuration management	Asset management database for IT organization	Process infrastructure to support Service Delivery Systems
Service Operations	Event management	A process capability to proactively detect and anticipate if service levels will not be met.	Process infrastructure to support Service Delivery Systems

Table 1: Non-core process areas in ITIL V3

Establishing analogy between CMMi-SVC and ITIL version 3.0

Based on Table 1 above, figure 5 below is evolved. Figure 5 is a blown up version which brings out the parallel vision between CMMi-SVC and ITIL V3. All process areas in a process group are split into the core and non-core areas in order to bring out the consistency. Core processes are retained within the central block whereas non-core process areas are included in their corresponding functional block.

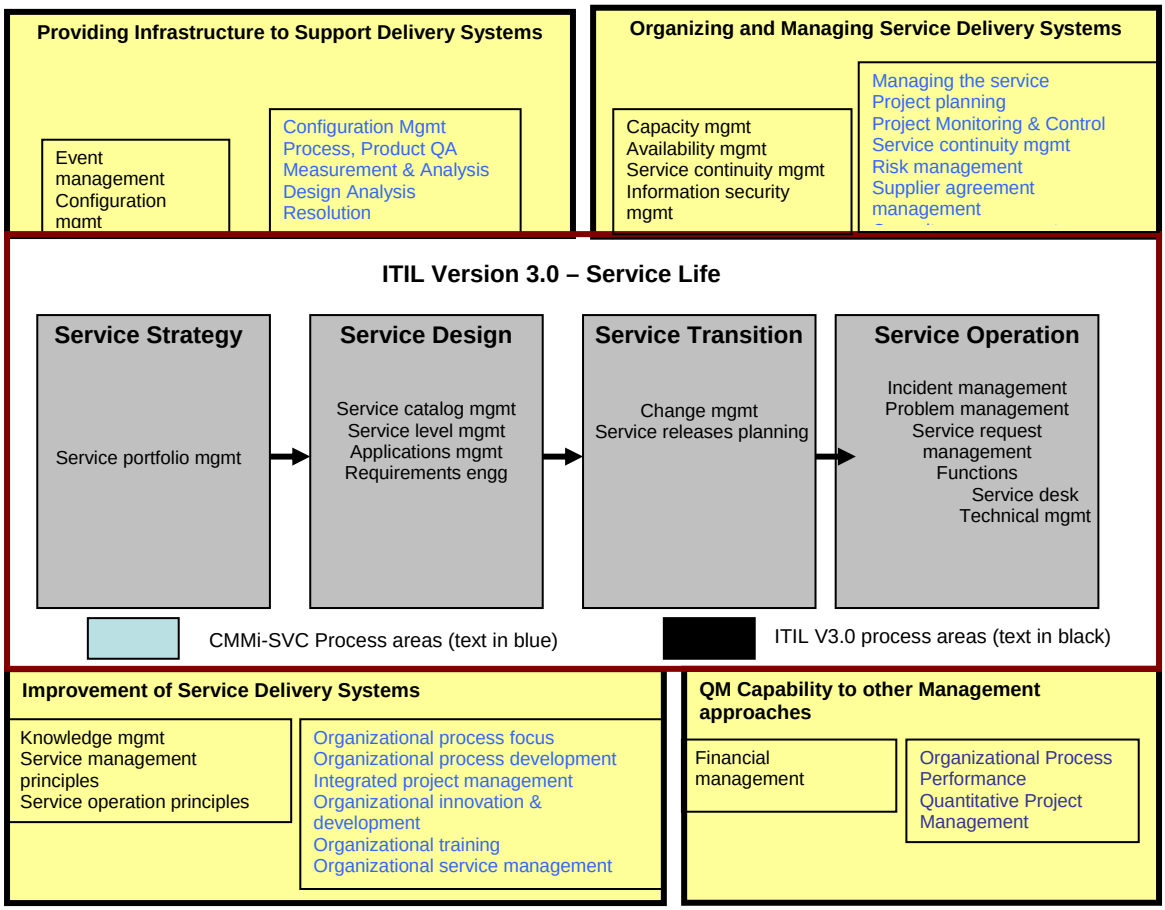

Figure 5: Simplified Service life cycle

Central block representing the life cycle has process groups with core activities listed. This can be compared to "Service Life Cycle" in figure 3. To elaborate further, the requirement development block or "Understanding service requirements" in figure 3 is functionally similar to Service strategy block in figure 5. Similarly, "Designing Service Systems" functional block in figure 3 which contains all service delivery process areas is same as service deign block in figure 5

Each of the functional blocks in figure 5 has support process areas from the two process frameworks. For example, "Organizing and Managing Service Delivery Systems" block has ITIL version 3.0 process areas viz. Capacity, Availability, Service Continuity and Information Security management and CMMi-SVC process areas viz. Project planning, Project Monitoring and Control, Risk Management and Supplier Agreement Management. Conceptually, these two set of processes are intended to provide a similar support for managing and organizing the Service Delivery Systems.

This emphasizes the fact that every functional block which supports core service life cycle has similar process components from both the models. Thus Figure 5 very efficiently illustrates the correlation of each process block from CMMi with that of ITIL version 3.0. Existing functional blocks in CMMi-SVC can be assessed for adequate coverage of related process areas from ITIL. Figure 5 thus becomes the basic building block for any further studies on analogies between CMMi-SVC and ITIL V3 and can prove to be extremely useful to develop a maturity model for ITIL life cycle service phases based on CMMi.

5. Conclusion

This paper brings about the similarities and differences of CMMi-SVC and ITIL V3. The idea is built around the scope of service life cycle management which is supported by both ITIL V3 and CMMi-SVC. The service life cycle as explained in this paper are set of activities involved in conceptualizing, designing and delivering the services. Process areas have been broken down further into core and non-core activities to establish the analogy between ITIL version 3.0 and CMMi-SVC model. Core activities contribute to the life cycle whereas non-core activities form the support infrastructure. This paper forms the foundation for all future work in the field of IT services process framework. By establishing this analogy, best practices can be cross leveraged. This gives possible directions to expand current coverage of each of the model. This throws open multiple avenues that researchers and practitioners can follow in the vast arena of Maturity modeling and Capability building.

6. Abbreviation

ITIL – IT Infrastructure library

CMMi – Capability Maturity Model Integration

CMMi-SVC – Capability Maturity Model Integration – Services

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