TM Forum Frameworx

Statement of Direction
by the Blueprint project

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Executive Summary

TM Forum frameworks have been successfully adopted by many of the world's service providers and their suppliers. However the world in which TM Forum operates is changing at an incredible pace and several key trends continue to affect the evolution of TM Forum frameworks:

- The continued downward pressure on service pricing which is driving ever greater business efficiency and new service innovation
- The emergence of complex service delivery value chains
- customer power and the need to continually deliver more for less
- Radical technology changes allowing the delivery of multiple services across one common IP infrastructure but with significantly greater software components
- The emergence of Service Oriented Architectures (SOA).

To ensure that the Forum's core frameworks keep pace with these changes, the TM Forum Board has established a project called 'Blueprint'. The Blueprint project was under the direction of TM Forum staff. It included interviews with numerous companies among TM Forum members and outside of the membership community about the current and future state of the industry. The gathered findings were socialized across various teams in the collaboration program for feedback. This "Statement of Direction" is the Blueprint advice for an evolution strategy for the TM Forum Frameworx. It will cover the Forum's response to key industry trends, alignment with other standards and frameworks such as ITIL, and support for companies who operate solutions (Information, Communications, Entertainment) businesses.

This document is structured as follows:

1. The new business landscape which is emerging to support digital services
2. The TM Forum's Frameworx' roles within a Service Oriented Enterprise (a modular organization, where process, information, systems, and people are grouped to provide reusable business services [element of functionality] with which the enterprise operates) and the evolution of the existing (Systems) Integration Framework
3. A summary of Frameworx methodology, including an overview of the Integration Framework, which is impacted the most
4. A summary of key changes.

1. The Shifting Industry Landscape

The provision of new wave digital services now involves players from a good number of previously discrete industries. An end user may enjoy a service which has involved players like Sky, Google, Insurance Companies, Health Service Providers, Time Warner, and eBay as well as Nokia, Microsoft and telecommunication companies. An increasingly sophisticated mesh of revenue models (both direct and indirect) will direct the commercial flows across the value network. So, content creators, aggregators, distributors, and device manufacturers are all now playing in spaces that have converged.

Figure 1.1 – Converging Industry Sectors shows how these sectors are starting to converge on each other. The small green circle represents Communications Providers, an area which historically has been the epicenter of TM Forum's work. The Forum's scope is now represented by the much larger envelope depicted in the figure below: it now spans aspects of content creation, packaging, distribution, and consumption.

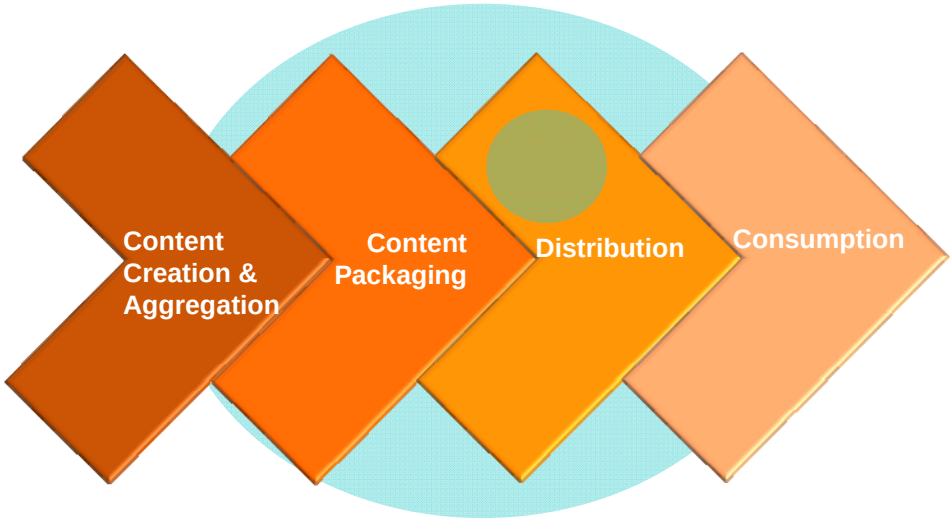

Figure 1.1 – Converging Industry Sectors

This section discusses five key industry trends which will affect the evolution of TM Forum frameworks:

1. The convergence of service
2. Customer Centric Experience
3. The move from monolithic supplier to distributed value networks
4. The rise in expectations of end-to-end service

5. The impact of Service Oriented Architectures (SOA).

1.1. Convergence

The business convergence described in the previous section has been driven primarily by the demand for converged services. The convergence of gaming platforms, digital personal video recorders, and home computing servers is just one example. The evolution of the mobile phone into a multi-purpose access device is another. However the most striking example of convergence is the evolution of the World Wide Web into a distributed software platform. The convergence of networks and IT has underpinned this revolutionary thinking. Routers are just software programs. Voice is just an application. The resource which must be managed in this world is the converged resource called distributed computing power. Sun's marketing slogan of the 1980's was twenty years ahead of its time: in today's world, the network is the computer.

1.2. The Customer Centric Enterprise

Customer centricity, the focus of the Customer Experience initiative, advances an enterprise to include a customer-centric approach. This assures multi-product offerings that depend on a value chain of agile, customer-focused stakeholders and requires that an organization truly understands and influences the full lifecycle of the customer. This understanding begins with events initiated by a prospect or customer, such as when a user logs on to their email account, when a subscriber turns on the TV. Presence is also important to understanding a customer, such as knowledge about the contents of an address books.

The nature of "services" has changed, and so too must the focus and actions of those providing services and managing resources. It is crucial that enterprises build more than just products and services, but branding and loyalty that improve customer perceptions of quality. To build a strong foundation for loyalty, a broader view of the customer lifecycle is needed. The view begins before first contact and continues through to the actual delivery of the offerings. That means considering more than in-service quality of the delivered products, but also the pre-custom, pre-service aspects of the customer relationship. Success will require intentional management of "knowledge" based on both customer and user preferences, as well as behavioral and social network affiliations that influence and shape inner circles and social groups.

This approach sheds light on people, content and the supply chain, thus enabling infrastructure to be built around the desired end-to-end customer experience, rather than just around resource performance goals.

In addressing customer experience, an enterprise needs to have a 360-degree view of the relationship and interactions between the customer and the provider. The most important thing to recognize is that these relationships are formed before any service is provided, and are maintained by experiences during the provisioning and operation

of the service. In support of this, there exist four customer centric pillars aspects as shown in Figure 1.2 -- Customer Centric Pillars.

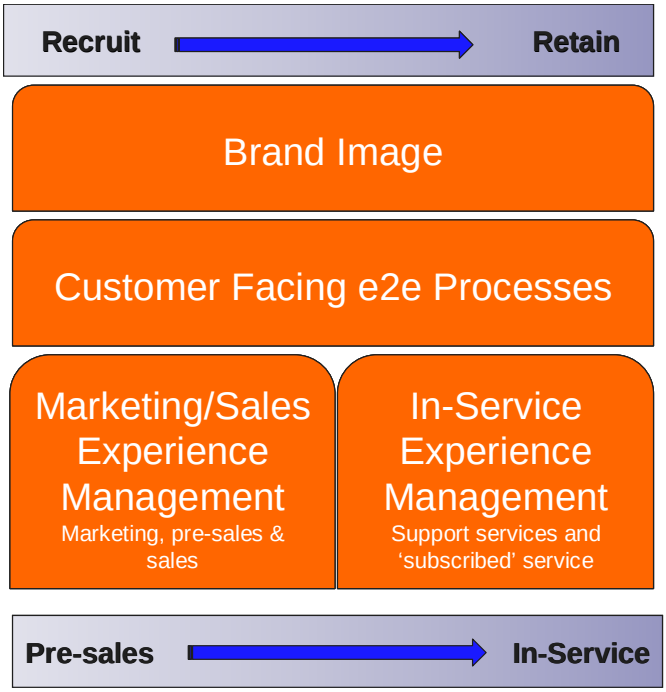

Figure 1.2 -- Customer Centric Pillars

The four pillars are:

- Brand Image

  Brand image addresses the enterprise's need to relate to customers' and/or social groups' behavioral and lifestyle /aspiration image. If an enterprise wants to cultivate its image in sports, entertainment, lifestyle, and social issues, it can promote a specific cause that harmonizes with what the target customer wants. For example, environmental consciousness that leads to campaigns to reduce carbon footprint

- Customer-Facing e2e Processes

  In-Service, Customer-Facing Processes which support customer-centric service fulfillment, assurance, and revenue management. It's all about being easy to work with

- Marketing/Sales Experience Management

  Pre-service marketing that connects with customers before they are customers, and demonstrates how a product offering can meet their service needs. That can drive service usability and adoption by customers

- In-Service Experience Management

  In-Service Product/Service Quality ensures the service is available and usable to both customers and users and meets their Pre Service expectations and needs.

All four Pillars satisfy some specific aspects of customer and user needs, and can be measured using techniques such as those developed in the TM Forum Benchmarking program and the SLA Management Handbook.

In-Service, customer-facing processes are a particular focus as they help improve the efficiency and effectiveness of the organization, and improve customer satisfaction. It's a win-win proposition that is mostly under the direct control of the enterprise.

Service Quality Management underpins In-Service Service Quality. However, the traditional measurements developed by the industry are based upon "aggregating up" resource performance measures to create product measures. This is a partial answer, but needs to be augmented with information about other aspects of the customer/user relationship not usually contained in Customer Relationship Management systems. The traditional SQM/QoS measures need be enhanced to include a customer centric approach. There is a body of work that has been developed by the TM Forum in this area including the SLA Handbook (GB917 series) and the Wireless Services Management guide book (GB923).

1.3. Distributed Value Chains

The complex eco system of industry players involved in the delivery of a service to an end user raises some profound questions about its operation. How can end-to-end (e2e) service be guaranteed in such a world? How is revenue accrued? Who owns the customer relationship?

The TM Forum through its Value Chain initiative is committed to producing frameworks which allow distributed value chains to deliver e2e customer service, support a wide range of revenue models, and provide the required customer experience. The role of frameworks is paramount in such a distributed world where business agility will be measured in terms of a company's ability to effectively participate in various business eco-systems. The metaphor of plugs and sockets is realized in today's world as a set of reusable business services. Because the days of internal, monolithic processes which operate in a single company are fast disappearing, the world of distributed value chains requires useful standards like never before.

Frameworks should enable agility and service velocity and are critical to the success of companies in any of the sectors identified in Figure 1.1 – Converging Industry Sectors.

1.4. Service Expectations

The dis-aggregation of service provisioning, from single supplier to distributed value network, comes at the same time as an opposing trend. Customer expectations about genuine e2e service management have risen exponentially in the past decade. Business organizations are no longer content to take a collection of disparate network services, applications, and computing platforms, and to string them together themselves. Customers are demanding service level agreements at the level of

distributed applications, rather than at the level of network throughput. So, traditional functions like capacity management, problem resolution, and fulfillment all need to be re-invented for a world which demands seamless service to operate across business boundaries.

1.5. The Impact of Service Orientation

The software industry has had to endure a great number of false dawns. New technologies, approaches and standards have been heralded with great enthusiasm, only to atrophy within a number of years. So TM Forum has approached the subject of Service Oriented Architecture (SOA) with caution. The approach has the potential to meet many of the challenges laid out in the previous paragraphs. However SOA will only do so provided it is not sidetracked into a world of theoretical abstractions. TM Forum is convinced that the power of service orientation lies in its ability to provide a set of highly cohesive, loosely coupled ***reusable business services***. It is this set which provides the basic 'vocabulary' needed to articulate the business processes which must flow across distributed value chains.

The emphasis, therefore, is not on the low-level software protocols used by reusable services to interact. The focus is on the set of reusable business services which business eco-systems can assemble in order to deliver e2e customer service, support a wide range of revenue models, and provide the required customer experience.

The chapter entitled 'Frameworx Methodology' describes the principles which will drive TM Forum's proposed approach to service orientation.

2. The Drivers for Change

The first chapter described the key industry trends which TM Forum believes will shape the evolution of its frameworks This chapter presents the 'client requirements', or business drivers which should guide the evolution strategy for TM Forum frameworks. What should members expect from TM Forum frameworks? The following answers are provided as a starting point:

1. The frameworks should allow communications providers to participate in distributed value chains, and to set up easily different commercial arrangements with other players for new products and services.
2. Stability. TM Forum frameworks must evolve carefully, and in a way which maintains confidence in the core frameworks.
3. Usefulness to designers and engineers. TM Forum frameworks should form a bridge from the world of requirements and theory into the word of implementation. A key measure of this feature is the level of penetration of TM Forum frameworks into the design communities of its member companies. A very strong and harmonious link exists between TM Forum staff and the experts who attend TM Forum events. However, TM Forum desires to understand the level of engagement across the wider design and engineering community in each member organization. It is clear from the levels of training requested by many companies that the engagement of real designers with TM Forum frameworks is often very high. However in other companies the frameworks do not seem to have gained traction at the level of design and engineering.
4. The frameworks should enable service providers to clearly define procurement specifications. In particular, commercial off the shelf (COTS) package functionality should increasingly be able to be expressed in terms of business services and interfaces to be agreed with equipment and IT vendors. Conversely, the COTS vendors must be given the flexibility to add value by offering non-standard services in addition to the TM Forum defined business services and interfaces.
5. The existing TM Forum frameworks should be enhanced to support indirect revenue models and the implications of: digital rights management (DRM), digital wallet, security, content management and more explicit support for communities.
6. The frameworks should be designed to link obviously and easily with other externally developed standards, frameworks and best practices such as ITIL.
7. The frameworks should recognize that agile development will almost certainly be the only way certain reusable services will be created. So TM Forum should be as interested in environments and methodologies as in 'nailed-down' service sets. An iterative approach to the development of reusable services will be required, particularly for those services associated with service execution and content management.
8. The TM Forum shall guide how to apply the frameworks onto a company environment. It should support large-scale outsourcing contracts as well as

products. TM Forum should create a methodology which helps systems integrators to take a complex and chaotic suite of legacy systems and processes, and morph it into a TM Forum compliant architecture.

3. TM Forum Frameworks Today

Frameworks provide key means for companies striving for total cost of ownership reduction and new revenue streams through agile integration of a dynamic value chain in a highly competitive world. The TM Forum Frameworx are not esoteric architectural concepts which have no bearing on the real world: They are in fact a key path towards highly automated business processes within any of the organizations in the value map shown in Figure 1.1 – Converging Industry Sectors. However the importance of frameworks is heightened by the need to cope with the changes identified in the previous chapter. The new world of distributed value chains and customer centricity must, by definition, require significant process integration across business boundaries as well as a change in focus for enterprises. So, go-it-alone and infrastructure-only solutions simply won't work in today's world.

3.1. Leveraging Today's Frameworks

Frameworks can deliver the four basic ingredients needed to achieve this type of zero-touch process integration:

1. Alignment of business models and processes for the key 'touch points' in the value chain
2. A common view of the information which must flow between systems and people in various organizations
3. A set of system-level integration mechanisms to decrease the friction in the integration activity.
4. The management interface specifications such as those within the Interface Program.

One focus area of TM Forum deliverables is the creation of basic vocabularies from which business interactions can be constructed. The abstract business models which underpin the Business Process Framework (eTOM), for example, make the deconstruction of monolithic processes into distributed value chains possible. This specific piece of valuable thinking has already been identified in the work done to bring ITIL and TM Forum frameworks into alignment. (TM Forum is committed to creating standards which align with and complement the ITIL best practice).

It is to be emphasized that these frameworks and specifications are currently being used for system integration. However, the TM forum has not yet specified a methodology or framework for using these existing frameworks and specifications in a formal manner. This present document and the associated document on methodology intend to provide such a unifying framework, known as the integration framework.

In summary, the TM Forum is focused on improving business effectiveness for service providers and their suppliers. Serving the information, communications and entertainment industries, the Forum provides practical solutions, guidance and leadership to transform the way that digital services are created, delivered and charged.

3.2. Impact on Today's Frameworks

The industry trends and drivers for change necessitate a methodology that in part show how the frameworks work and can be used together. Another goal of the methodology is to make TM Forums core frameworks easier to use, better integrated, and in line with key business and software directions, including service-orientation.

Figure 3.1 - Solution Framework Methodology Focus shows the methodology's focus as the four Frameworx (rectangle in red) within the context of the overall TM Forum Collaboration Program.

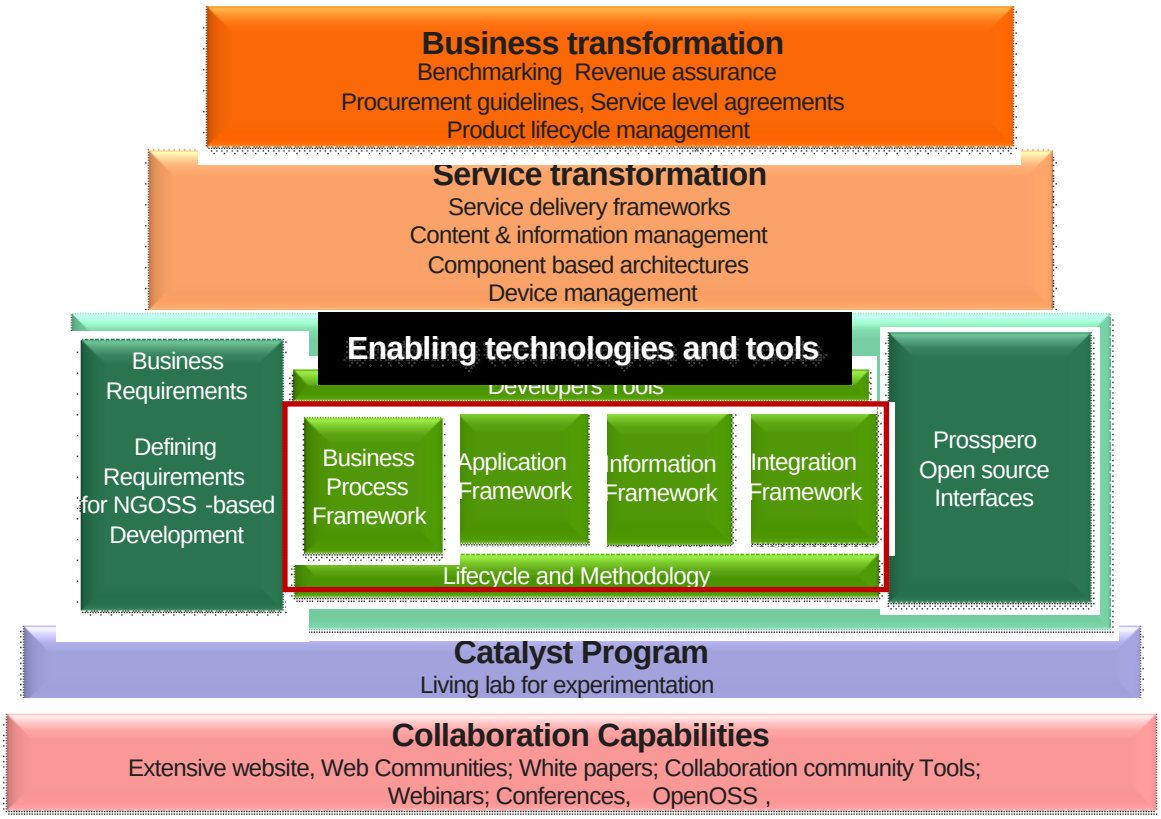

Figure 3.1 - Solution Framework Methodology Focus

A significant change is the augmentation of the Systems Integration Framework (aka Technology Neutral Architecture), represented by an enhanced Integration Framework (the word System has been removed). The Integration Framework has been augmented with two brand new elements. The first is the notion of a platform-architecture. In simple terms, a platform-architecture is a company implementation that takes process and information elements and presents them as a service oriented blueprint. This new blueprint is gradually implemented by an increasingly rich set of reusable services held in the second key element of the Integration Framework – the Business Services Repository. The platform architecture concept is detailed in section 4.2.3.

The proposed Business Services Repository contains *reference implementations of TM Forum frameworks*. This will show how the Interface Program's **interfaces**, where lots of the useful technical content has been created, and other work associated with the development of business service (also known as NGOSS Contracts), such as that being done by the Architecture Harmonization team, can be placed within the Business Services Repository. The repository will of course have a sandbox for trying out new ideas. However, over time the interfaces work will be driven by the need to implement the services defined in the platform architecture.

The terms "business service" and "interface" are used throughout this document. It is important to understand the relationship between the two.

An interface (at least in the sense that has been used in the TM Forum work) is a collection of operations with a common purpose such as resource alarm management. In the TM Forum, interfaces have typically been defined without any mandate concerning the type of application that exists at either end of the interface. So, for example, the MTOSI Manage Resource Inventory (MRI) interface can be used between a variety of end points. The most common example would be between two inventory applications but the MRI interface could easily be used between a fault management system and inventory management system. There are many other examples.

Business services, on the other hand, are similar to interfaces but there are some differences. One difference is that business services are between two clearly defined endpoints. Another difference between interface and business service is the additional business information, for example, the time period under which the business services available.

At this point in time, the TM forum has only published interfaces and not business services. However, the intention is to reuse the existing interfaces, of which there are many, and recast these as business services. The idea is not to lose any of the good work concerning existing TM Forum interfaces and not to change the "on the wire" formats of existing interfaces, but rather to extent and supplement the interfaces with additional context as defined in the business service concept. This is ongoing work.

The Integration Framework provides a unifying function in the Frameworx. It takes the key elements from the process and information frameworks and binds them together to form sets of business services being exposed and/or consumed by applications in the Applications Framework. The Integration Framework provides a blueprint of business services. The groups of services were formed by taking the information entities in Information Framework and grouping them using the way in which they were used together by processes in the Process Framework.

4. Frameworx Implementation Methodology

The development of any methodology should be driven by a set of key principles. The principles which underpin the architecture of the Frameworx are:

1. Sets of reusable business services will be defined in such a way that end to end processes can be constructed from pre-fabricated components
2. The interfaces associated with business services will support the integration of applications
3. New platforms can be defined for industries such as service execution and content management out of platform templates.
4. TM Forum will not create its own version of software engineering specifications for the basic definition and development of reusable business services. The TM Forum will focus on creating a vocabulary for businesses to play in a converged, but distributed, world.

4.1. What Enterprises Want from a Methodology

Every enterprise in one sense is on the same journey. There are big forces shaping the business landscape, but scratch under the surface and the same issues lurk underneath. Business leaders want agility and reduced cost but they are frustrated by the complexity of their IT and their processes. They want to stop building elaborate custom solutions every time they change a product specification. At the most senior levels in companies today the same mantra is being heard: We want to configure and assemble products and services from reusable components, not build our applications every year.

The term 'enterprise' is used in its generic sense, covering every type of business from service operator or vendor to content creator.

MIT Sloan School of Management analyzed the enterprise architectures of 103 companies[1]. They identified a four stage enterprise architecture maturity model. Some companies had no architecture at all – they just lived with unmanaged and unmanageable complexity. Some had an architecture which did little more than say 'buy from Supplier X and never buy from Supplier Y'.

The MIT model has been used as a paradigm for the evolutionary phase model used by the TM Forum as shown in Figure 4.1 - Enterprise Architecture Evolutionary Phases.

[1] Ross, Jeanne W., Enterprise Architecture: Driving Business Benefits from IT (April 2006). MIT Sloan Research Paper No. 4614-06; CISR Working Paper No. 359. Available at SSRN: http://ssrn.com/abstract=920666

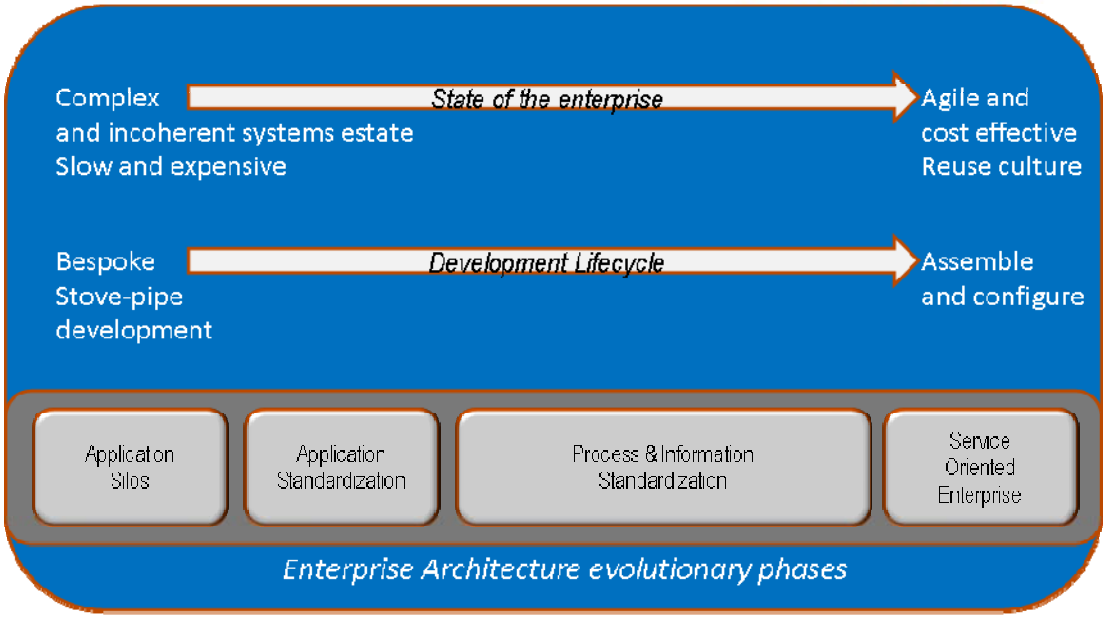

Figure 4.1 - Enterprise Architecture Evolutionary Phases

Application Silos phase – referred to a Business Silos in the MIT study. This phase is where IT organizations investment focus is in localized applications. This is often influenced by historical investment patterns were focuses on applications that address local business needs. During this phase there is little or no use of the frameworks/

Application Standardization phase – referred to Standardized Technology in the MIT study. From a framework perspective this is where the Application Framework can be used to develop standardized application procurement checklists by a requesting organization. It can also be used as a way to respond to requests for applications by the provider of applications, or as a tool for Line of Business Consolidations or Merger and Acquisitions we systems from disparate sources need to be aligned.

Process & Information Standardization phase –referred to Optimized Core in the MIT study. The frameworks role during this phase is in support of tactical use of them and in standards initiatives. Examples of the use are listed below:

Tactical uses may include:

- Using any of the frameworks to define project scope (boundaries), such as the scope of an application development project
- Using the frameworks to focus discussion
- Using the frameworks as a source for application development requirements
- Using the Business Process Framework to perform organizational analysis
- Using the Business Process Framework to show points of interoperability between applications
- Using the Application Framework to catalog SOA Services
- Using the Information Framework as a starting point for database design

- Using Integration Framework Interfaces and business services to support application interoperability.

From a standards initiative perspective, uses may include:

- Using the Business Process Framework as a enterprise wide or business unit wide process model specialized where necessary to support organizational, technology, geographical, or market requirements
- Using the Information Framework as a enterprise wide information reference model and starting point for any project that contains information requirements
- Mandating the use of the Integration Framework's Interfaces and business service structure and content.

Service Oriented Enterprise - Is a modular organization, where process, information, systems, and people are bundled to provide reusable business services with which the enterprise operates. The business services are designed to support the enterprise's portfolio of products (they are not product-specific). Business and IT are converged based on the business service model to achieve business goals in the most efficient way for a given market.

That gives an enterprise strategic agility, allowing organizations to adapt quickly to new business models, new technologies, and new partnering agreements. To achieve these benefits, the underpinning architecture must be enterprise wide. Standardization of process and IT is needed to tackle the proliferation of complexity in most organizations, where the landscape is often a collection of product specific stove pipes.

The key concept which delivers the benefits of an SOE is called the platform architecture that will be explained in more detail later in section 4.2.3. It is the concept which moves an organization towards being service driven.

Up to now the answers to the question 'what do enterprises want?' have been focussed internal to an enterprise. The real thing that enterprises want can only be expressed by looking at the distributed value chains in which enterprises must now operate as shown in Figure 4.2 - Distributed Value Chain.

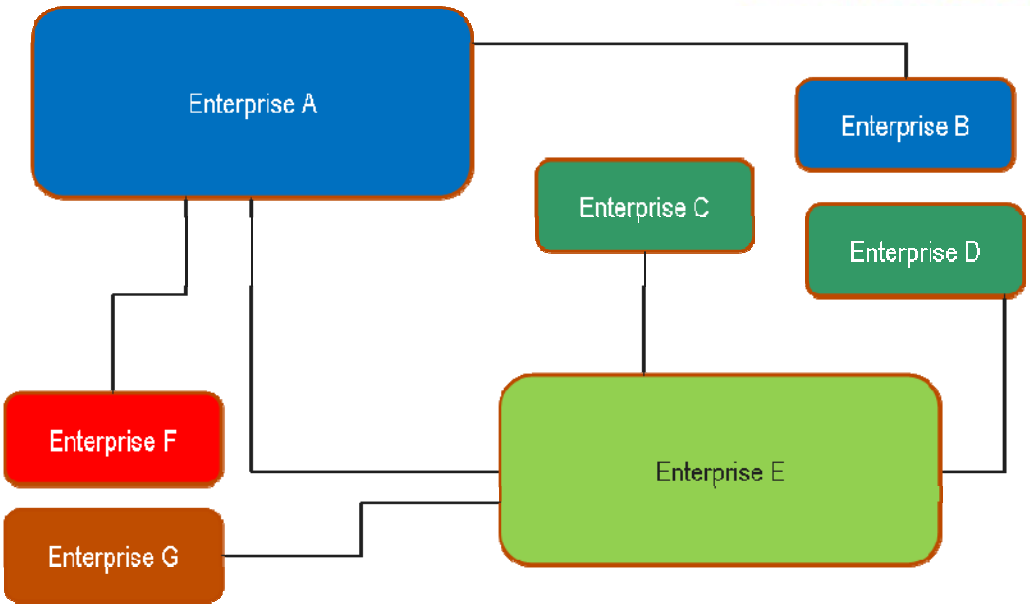

Figure 4.2 - Distributed Value Chain

In the modern world enterprises cannot survive as big monolithic suppliers who offer 'soup to nuts' service. In the modern world, success depends on the ability to assemble and disassemble collaborative eco-systems with real velocity. Speed of integration is the new competitive weapon.

This is where SOEs come into play. Modular organizations are designed to operate across value chains. Their approach to business process and IT assumes that reusable process elements can connect using standard, zero-touch and often real-time interfaces. So, the imposition of business boundaries between these connected services reduces to the (not insignificant) questions of SLAs and security. But the real costs sinks in the integration game have already been dealt with by an SOE.

But the need for frameworks which work at scale is dramatically increased by the move to distributed value chains. In Figure 4.2, the only way Enterprise A can run fast is if its interactions with other enterprises are standardized. Without standard frameworks, Enterprise A is doomed to march at the same rate as B-G.

The Integration Framework will leverage existing B2B standards, such as ebXML and RosettaNet. In the case of RosettaNet, an extensive set of standard interchanges have been defined within their Partner Interface Processes (PIPs). It is based on a notion of a standard external processes made up of standard business services. The process is orchestrated by an agreement called a Collaboration Partner Agreement (CPA) that states exact how each party will work with the other, such as the services used, profiles and allowed sequences of business services. CPA's structure is very similar to that of a business service. It is also designed to be established automatically, although this rarely happens due to governance considerations. These standards are described in GB921 B – Public B2B Business Operations Map (BOM) Application Note along with the principles that underpin them.

There is a requirement to enable the construction of end-to-end processes which operate across entire value chains as described here. Interfaces between bits of hardware are much easier than interfaces between organizations. Writing best practice guides is even easier. The real challenge is the development of frameworks which allow value chains to be articulated as the orchestration of a set of reusable business services, such as those provided by ebXML and RosettaNet.

Frameworks need to be a help to companies at whatever evolutionary phase they are at. For example, if a company is still treating architecture as a procurement checklist, then something like the Application Framework may be a useful thing. Companies which start to launch process harmonization initiatives should be able to turn to something like the Process Framework. IT departments which find the courage to tackle data diversity will train their solution designers in the Information Framework. These early phase approaches to architecture that progressively use all or parts of the frameworks in a phased implementation do generate significant benefit – reducing complexity, increasing speed, and starting to codify process within the organization so that organizational learning is streamlined. The use of these frameworks is shown in Figure 4.3 - Leveraging Industry Frameworks and Guides.

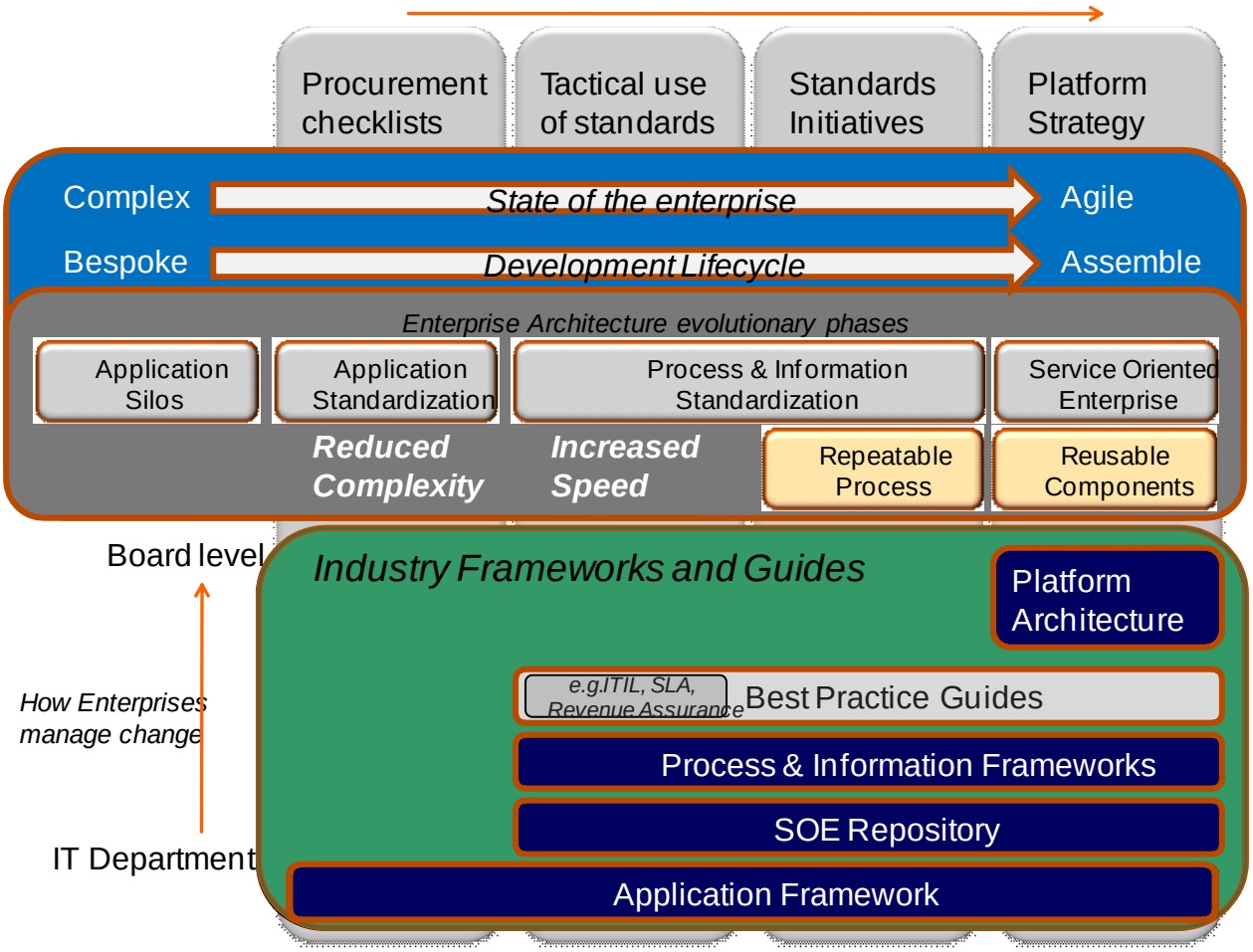

Figure 4.3 - Leveraging Industry Frameworks and Guides

However companies which want to transform themselves into an SOE will need a new generation of frameworks, what we have called the Integration Framework. The Integration Framework is not a new architecture. It is the successor of the Technology-Neutral Architecture which uses the Process, Information, Application frameworks and interfaces to support a service-oriented enterprise.

Not every enterprise will get to the latter phases. The level of executive sponsorship must increase when moving from one phase to the next. If phase two is sponsored by the CIO, then phase 4 has to be sponsored by the COO or even CEO.

4.2. Frameworx Architecture

The Frameworx Architecture encompasses the frameworks' current architecture and introduces some new concepts, such as business service, service set, and the platform architecture, which is part of the Integration Framework.

The Frameworx provide information, communications, and entertainment industry-specific process (eTOM), information (SID), and application (TAM) Frameworks united by an Integration Framework which includes Interface Program **interfaces** that support interoperability within and between distributed value chain participants accompanied by a methodology describing how to use them. The architecture builds on work already deployed in the existing TM Forum frameworks as well as identified enhancements to the frameworks.

There are various entry points in to the frameworks based upon focus/needs of the frameworks' user. For example, if focus is on a reusable set of web services, the entry point would lead into the Application Framework and/or the Integration Framework. Figure 4.4 - TM Forum Frameworx depicts various entry points.

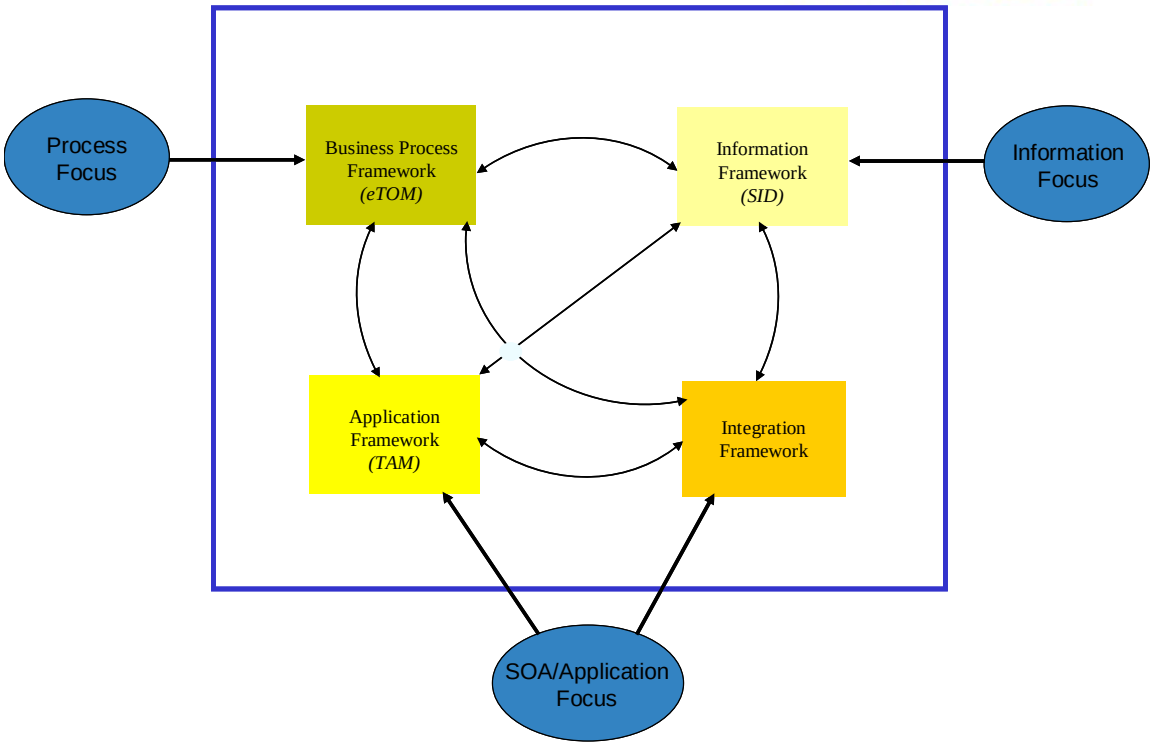

Figure 4.4 - TM Forum Frameworx

Figure 4.4 also depicts the associations among the frameworks. The Process Framework and Information Framework are naturally related. Processes act on entities defined within the Information Framework. The Integration Framework defines the interaction between processes and entities in more detail by describing the interaction in terms of details that characterize the entities, contained within Contract and interface specifications and their implementations. The Application Framework, composed of application areas, describes the processes and entities supported by the application areas and also serves as a catalog of business services and interfaces.

4.2.1. Business Service

A business service (aka NGOSS Contract) is an element of functionality. It may be:

task-centric, such as *Allocate Resource* or *Identify Customer*,

entity-centric, such as *Resource Service* or *Customer Service,*

utility-centric such as Notify.

The technical specifications within the Integration Framework define how the services are described using common models.

A task-centric service's context represents a service modeled to encapsulate process logic or use case steps. In this case, the thread that ties together the grouped logic or steps is a specific activity being automated by the service logic. Therefore, the use of verbs in service names is common.

An entity-centric service's context represents a specific business entity or group of entities. The focus of the service is on the entity or group of entities, but may act on other entities. The labeling of entity-centric business services is often predetermined by the entity name.

Another type of service is a utility-centric. A utility-centric service's context is found in application services involving operations that encapsulate cross-cutting functions, such as event logging, exception handling, or notification. These reusable services need to be labeled according to a specific processing context, agnostic in terms of any particular solution environment. For example, a utility service might be named Notify.

The relationship between a business service and the Process Framework and the Information Framework is shown in Figure 4.5 – Frameworx Concepts. Services that represent a combination are referred to as composite business services. Composite services can also be made up of other services. This is shown in the figure as Octagon 2. Additional information about services and types of services can be found in GB942CP – Business Services Concepts and Principles and GB942U – Business Service User Guidelines.

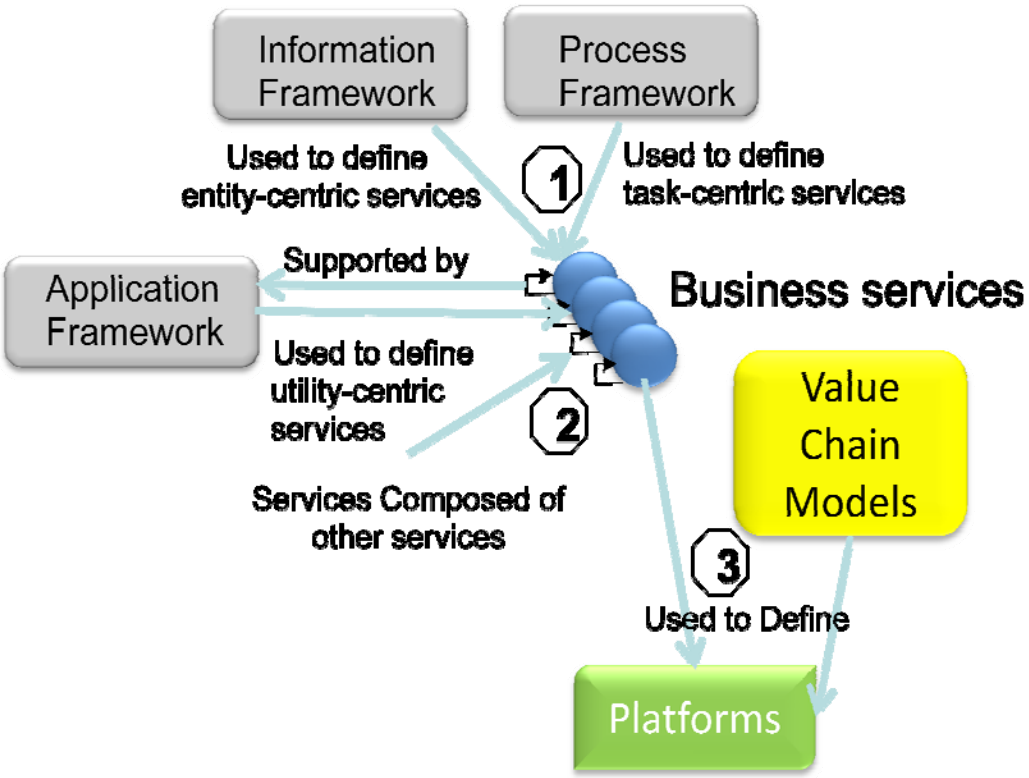

Figure 4.5 – Frameworx Concepts

The figure, as indicated by octagon 1, shows that business services can be sourced from the Process Framework and the Information Framework. Task-centric services can be derived from Process Framework level 3 and below processes, which represent the task level(s) of the framework. Entities from the Information Framework provided the "things" upon which the tasks act and use. Entity-centric services implement the complete set of tasks or a subset of the tasks, representing the decomposition of a core level 2 process, that manage the life of a cohesive group of business entities, called Aggregate Business Entities (ABE). For example, Product & Offering Development & Retirement manages the entire life of a Product Offering, from the time it is first envisioned by a Product Manager until the Offering is retired.

Utility-centric services can be identified by analyzing an application map of the Application Framework. Whenever a common or repetitive service is being identified, the service can be generalized as a utility. This is a continuous process between consequent versions of the Application Framework. The analysis process extends the Utility-centric services base and crystallizes the application map.

For example: The Application Framework 2.1 analysis identified a repetitive functionality across the customer layer. The functionality has been generalized as a one way communication transaction from the service provider to the customer in various business flows using a predefined template through different media (paper, email etc.). Such communications can be found in invoices, promotions and collection letters. Application Framework 3.0 introduced a generalized application function named "Transactional Document Production" that exposes utility-centric services for the management of those transactional documents. This use of the application has been demonstrated in the Application Framework 3.0 model for the bill formatting application in version 2.1.

The Application Framework's level 1 application areas will be used as groupings of business services, a sample of which are contained on the next figures. For example the Customer Management composite entity-centric service maps directly to the Customer Management application area. The Product Lifecycle Management composite maps to the Product/Service Catalog and Product Lifecycle Management application areas. This mapping may reveal adjustments that may need to be made to both the Integration Framework's services and the Application Framework's application areas. This will demonstrate how the application areas support the platform architecture, which is described below.

A platform is a grouping of business services, people and roles. Platforms are the building blocks of an enterprise architecture. Platforms are groupings of services, indicated by octagon 3, which reflect the focus of an enterprise, set out its top-level approach to service delivery, clarify the constraints imposed by the value chains in which the enterprise operates.

A suite of blueprint or example architectures for each industry sector as well as a methodology to produce TM Forum-conformant platforms will be provided in an accompanying methodology guide book.

4.2.2. Blueprint Composite and Entity-Centric Services

A survey of a number of TM Forum members revealed that they are either planning, developing, or are implementing Service Oriented Architectures that are comprised of entity-centric services. Many of these members use the Information Framework as

both a source of entity-centric services and as an organizing structure for these services.

Based on this and other factors, it is advised that the Integration Framework services blueprint will be comprised of "entity-centric" business services and composites of entity-centric services. Each entity-centric service represents a composite of all or a sub-set of the task-centric services that manage the life of the entities that make up an Information Framework level 1 Aggregate Business Entity as shown in Figure 4.6 - Draft Blueprint Composite and Entity-Centric Services. This figure represents a working copy of the Information Framework that was used to define the services blueprint. The criteria for identifying the services are explained following the figure.

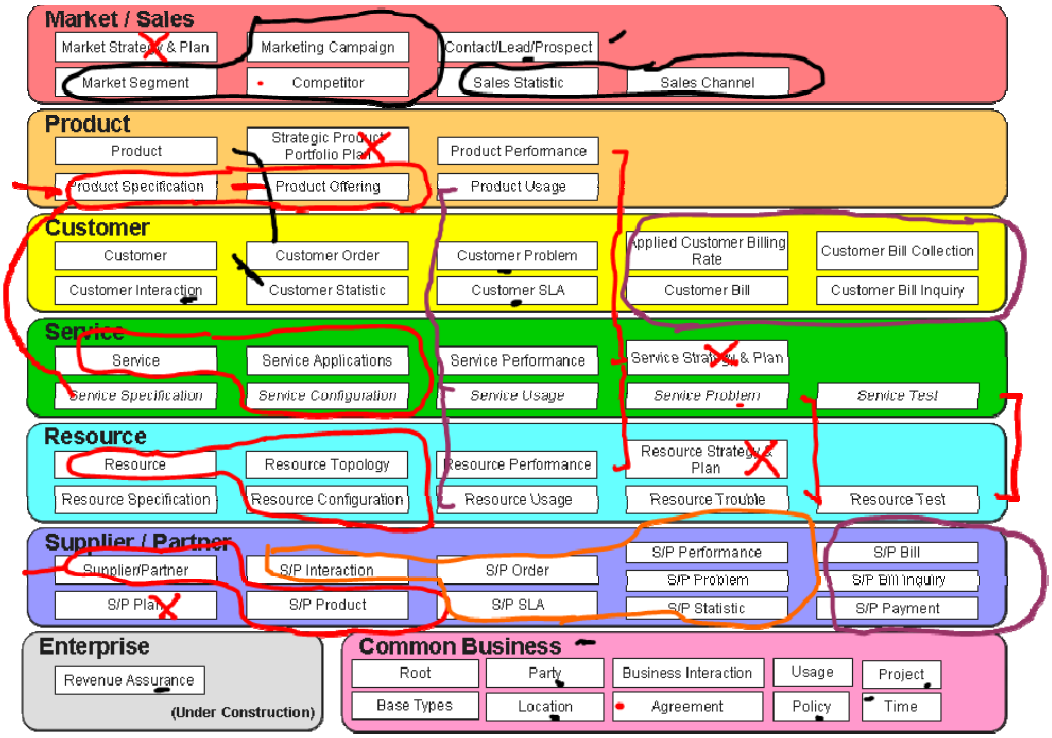

Figure 4.6 - Draft Blueprint Composite and Entity-Centric Services

It should be noted that many of these L1 ABEs are quite comprehensive and decompose into lower level groups of entities (ABEs). Therefore, a L1 entity-centric service may be composed of lower level entity-centric services. For example, within the Resource L1 ABE, there are a number of L2 and L3 ABEs that represent entity-centric services, such as Alarm, Equipment, and so forth. An example is shown later in this section.

The Level 1 (L1) services in the blueprint shown in Figure 4.6 - Draft Blueprint Composite and Entity-Centric Services have been defined using three criteria:

- Entity-centric services represented by ABEs were filtered to remove 'executive' functions, such as Market Strategy & Plan, which are typically performed using desk top tools rather than more formal applications

- Some ABEs were grouped into a single composite service using existing Process Framework to Information Framework mappings. For example, Order Handling manages the life of Customer Order ABE and Product ABE, so they were combined as shown by the line between the two ABEs
- Some ABEs were grouped into a single composite service because they have many characteristics in common and include a generalized ABE, or there would be a generalized ABE if the ABEs were developed, in the Common Business Entities domain. For example, Product Usage, Service Usage, Resource Usage, and Usage were combined using this criterion. This is shown by the line that groups these three ABEs and includes the Usage ABE in the Common Business Entities domain.

This blueprint and its services can be used as an organizing structure and a source of services for enterprises just embarking on the move to service orientation or as a check point to confirm an existing approach to service orientation. It should not be viewed as a framework containing the same level of detail as the other Frameworx. It will be used as a service-oriented catalog of services developed by the TM Forum which will be sourced using current TM Forum Interface Program Interfaces.

Figure 4.7 – Draft Blueprint Composite and Entity-Centric Services shows the L1.services.

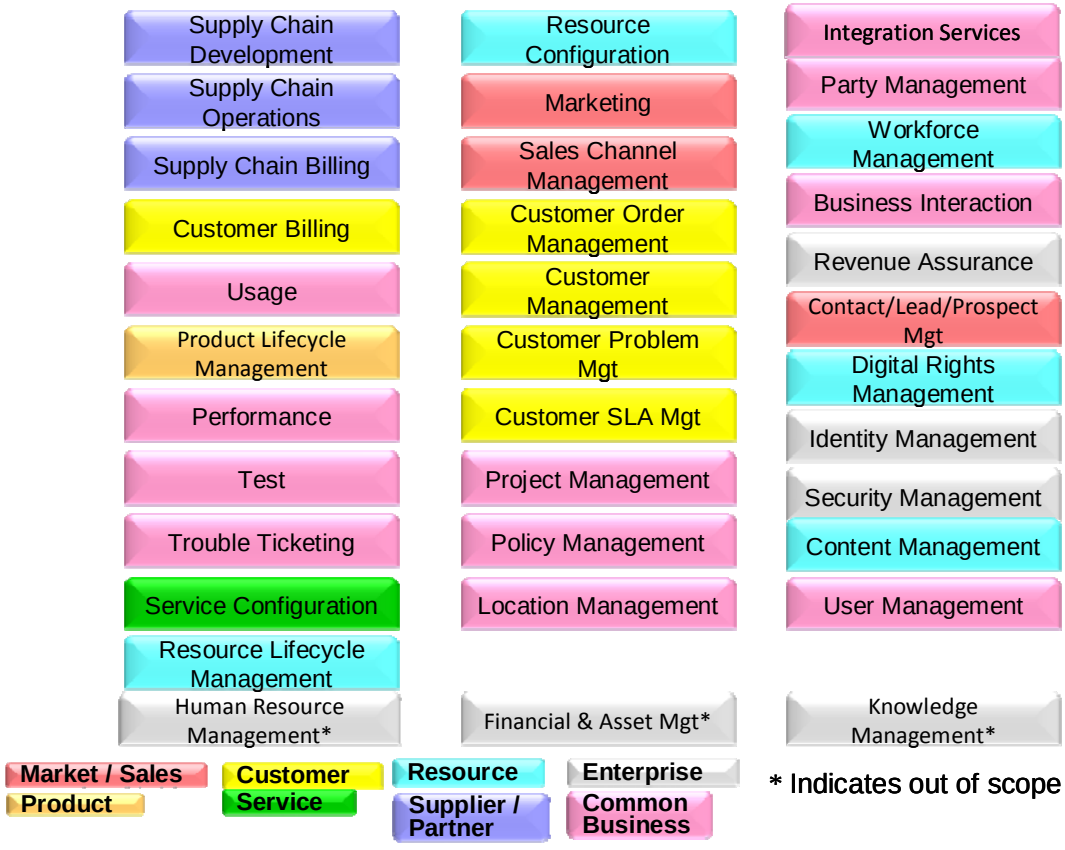

Figure 4.7 – Draft Blueprint Composite and Entity-Centric Services

An additional integration service has been introduced to cover orchestration services within an enterprise. Additionally, the Business Interaction service, which includes Customer Interaction Supplier/Partner interaction entity-centric services, in combination with applicable Customer and Supply Chain services will support offered external services among distributed value chain participants.

The services in the figure are presented as color-coded 'tabs', a library of elements used to form platforms, which are described in the next section. An additional integration service has been introduced to cover orchestration services. The color-coding uses the domain concept, which is fundamental to the structure of the other three Frameworx. Domains are not platforms; they are just an organizing principle that provides a structure for the services.

Figure 4.8 - L2 Services[2] depicts lower level services. For example, the Customer Management service is a composite made up of two entity-centric services; Customer Order Management is a composite of the Customer Order and Product (not shown in the figure, but explained in an earlier example) entity-centric services. Each lower level entity-centric service can also be viewed as a composite made up of task-centric services. Shown in the figure are the task-centric services that correspond to the Process Framework's L3 processes that manage the life of a Customer Order.

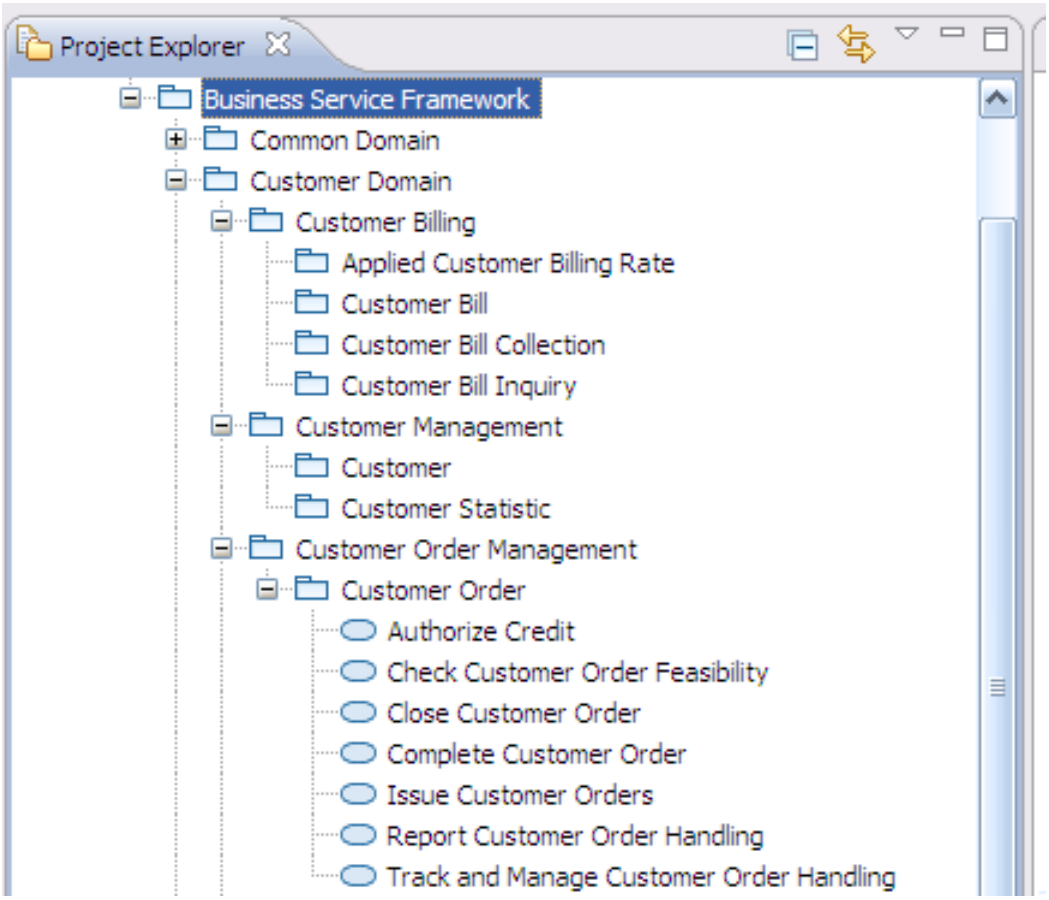

Figure 4.8 - L2 Services

[2] The content in the figure was developed using Rational Software Modeler.

4.2.3. Platform Architecture

A platform is a grouping of services, people and roles. The key thing about a platform is that it is a "real" implementable thing. It has managerial significance. Its definition reflects the focus of an enterprise and its top-level approach to delivering service within the constraints imposed by a specific business model. A platform is a device to manage the complexity of an organization's processes and IT infrastructure.

Platforms are the building blocks of an enterprise architecture. Platforms reflect the focus of an enterprise, set out its top-level approach to service delivery, and clarify the constraints imposed by the value chains in which the enterprise operates. Figure 4.9 - Platform Views depicts two ways of viewing a platform.

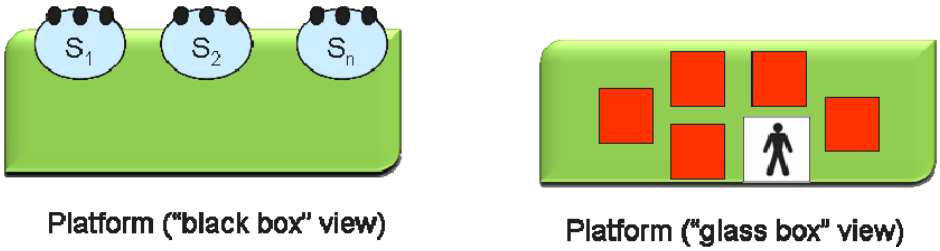

Figure 4.9 - Platform Views

The "black box" provides the ability to only see the services that comprise the platform. The "glass box" provides the ability to see the applications and people roles involved in the business services.

There is no 'standard' platform architecture. Each enterprise will have its own platform architecture based on the business model under which it operates as shown in Figure 4.5 – Frameworx Concepts. Conformance to TM Forum frameworks in part would be based on its use of services that make up the Integration Framework services repository, and if it is derived using the Frameworx methodology.

There is an opportunity to develop a set of example (template) platforms for different distributed value chains and/or business models. For example, templates could represent the platform architecture for a mobile virtual network operator, a Line of Business model, a device manufacturer, a web company, a communications company.

The next series of figures show how an enterprise specific platform architecture can be developed starting with service. Figure 4.10 - Enterprise Specific View of Service shows the starting point for defining the architecture based on the selection of a subset of services.

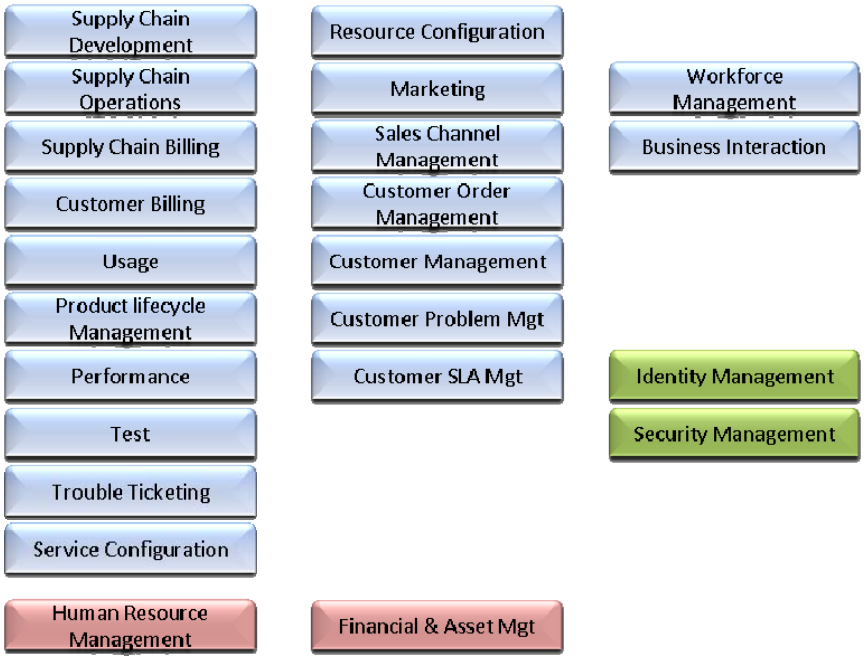

Figure 4.10 - Enterprise Specific View of Services

Figure 4.11 – Enterprise Specific Services Grouped into Platforms shows an example of how the services could be grouped into enterprise specific platforms. It should be noted other groupings are possible.

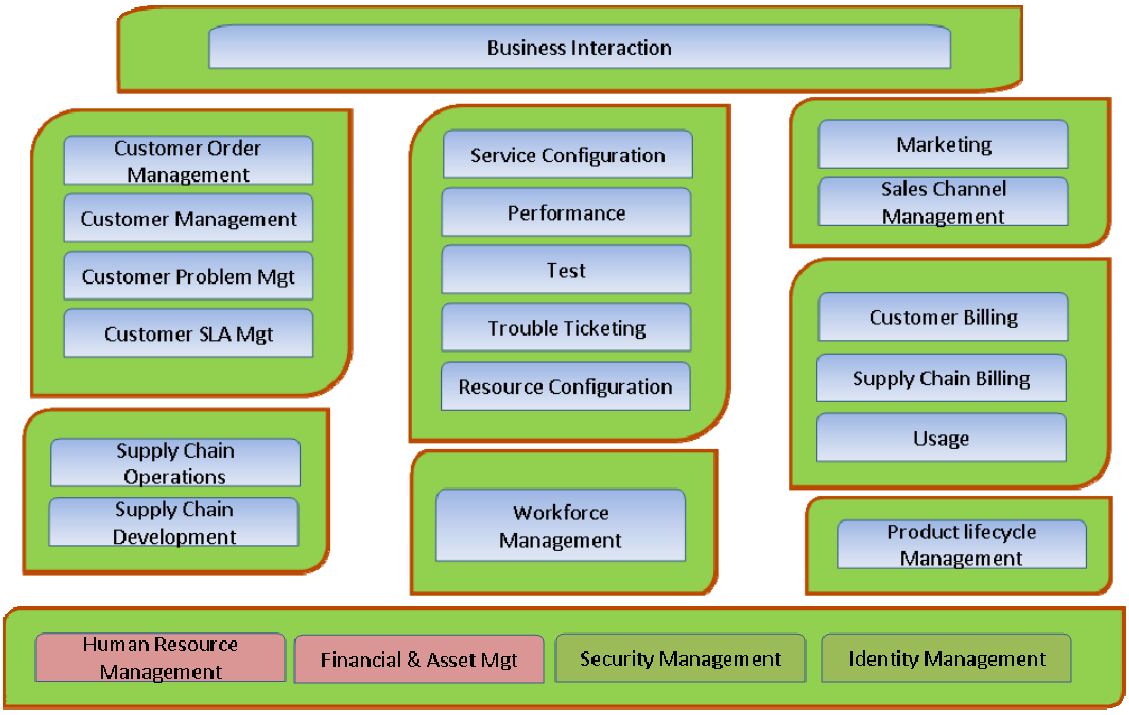

Figure 4.11 – Enterprise Specific Services Grouped into Platforms

Figure 4.12 - Enterprise Specific Platforms Architecture shows the resultant enterprise specific platforms architecture.

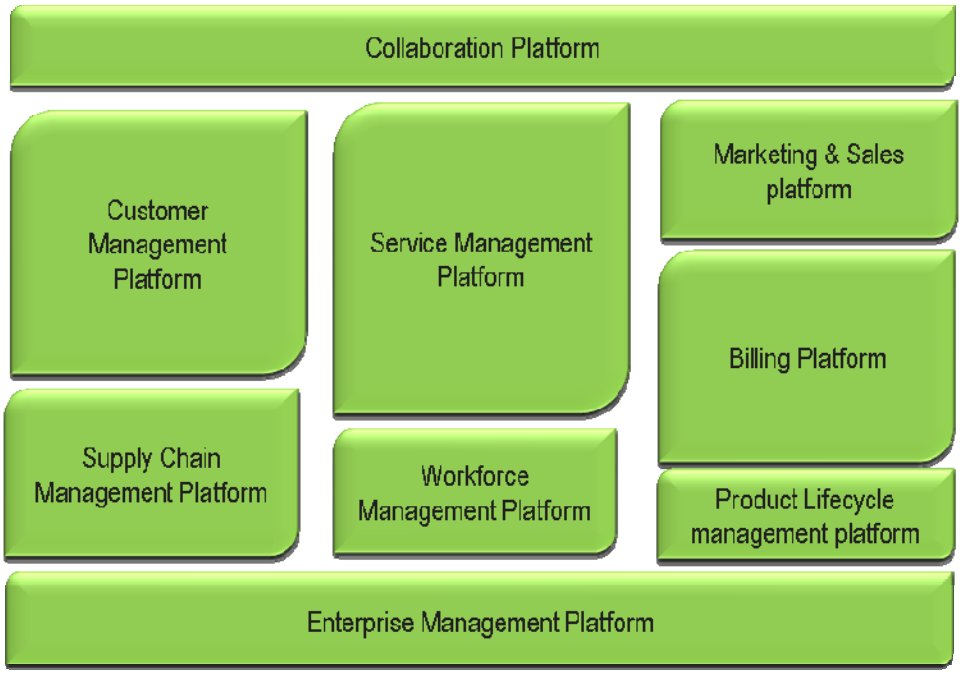

Figure 4.12 - Enterprise Specific Platforms Architecture

The real power of an SOE lies in its ability to play a role in a collaborative eco-system quickly and at low cost. Figure 4.13 - Interacting Enterprise Specific Platform Architectures shows how the platform concept supports the efficient and effective operation of distributed value chains. The Collaboration platform shown in Figure 4.12 - Enterprise Specific Platforms Architecture will forge and monitor inter-enterprise business services.

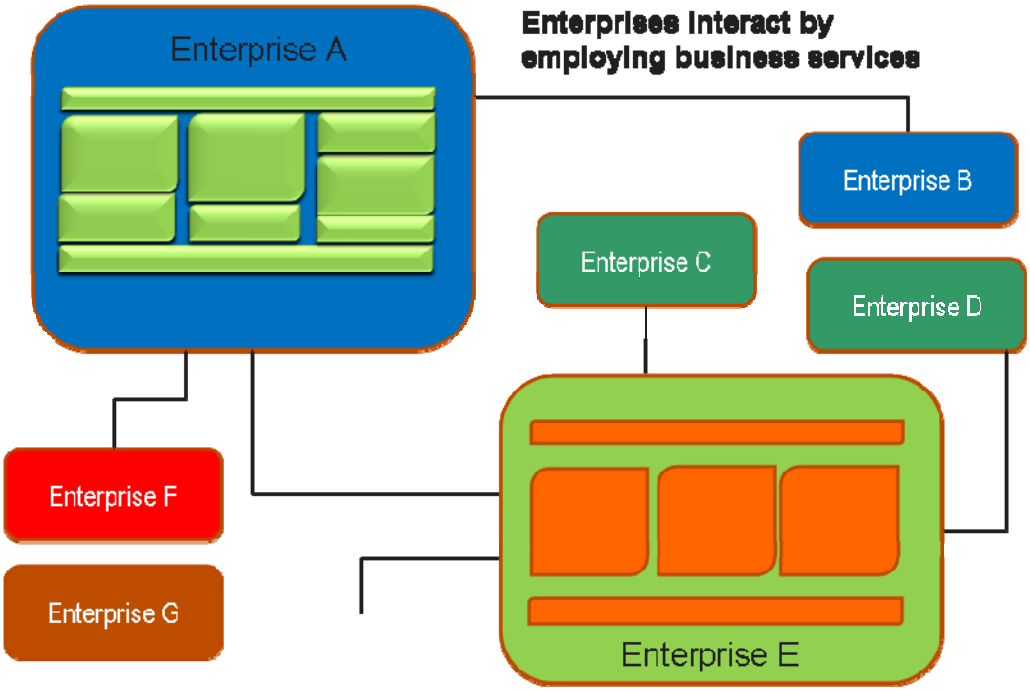

Figure 4.13 - Interacting Enterprise Specific Platform Architectures

4.3. Overview of Implementation Methodology Phase 4

The Frameworx Implementation Methodology provides a process and techniques to assist an enterprise in making the journey through the enterprise architecture evolutionary phases as shown in Figure 4.1 - Enterprise Architecture Evolutionary Phases that employ the Frameworx. Phases 1 through 3 exploit the Application framework, Information and Business Process frameworks. The fourth phase uses the Integration Framework to develop enterprise specific platforms. Figure 4.14 – Phase 4 of the Frameworx Methodology contains a summary of how this fourth phase works.

Figure 4.14 – Phase 4 of the Frameworx Methodology

The methodology in phase 4 is comprised from two steps: Definition and Development. The first step in the Frameworx Methodology Phase 4 is the Definition Method. It uses sets of composite and entity-centric business services shown in the left hand side of the figure to identify the relevant services to the enterprise. Next strategic focus areas for and synergistic goals for the enterprise are identified.

Then value chain models in the platform template shown in the left hand side of the figure are used to describe the value chains in which the enterprise participates. It can be modified based on the enterprise actual value chain descriptors. This will give critical groupings of business services and identify platform boundaries shown on the right hand side of the figure. Identify topological constraints on the organization such as regulatory decision to de-construct an organization into lines of business. Then group the business services in platforms using focal points, goals, and constraints shown at the top of the figure along with platform patterns shown on the left hand side of the figure.

Lastly, describe the key scenarios in the value chains as orchestrations of the reusable business services.

The second step in Phase 4 Development Method is used to express solution designs in terms of reusable business services which make up the enterprise's platform architecture using existing SOE services from the repository and technical specifications shown on the left hand side of the figure. There may be a requirement to develop new business services or enhance existing ones using the Technical Specifications. It is hoped that new and enhanced business services specifications and possibly the reference implementation(s) will be contributed back to the TM Forum for team review and for others to use.

5. Summary of Key Changes

Provided here is a summary of key changes to the way in which the TM Forum provides solutions to the industry:

- Integrate the frameworks into a common business service based blueprint
- Provide a Frameworx methodology to help companies exploit the frameworks in the real world
- Align as much as possible with ITIL, and other best practices, while showing a methodology and set of frameworks into which any best practice guide can be slotted
- Increase focus on practical implementation via a cased based approach
- Guide companies to create their own architectures from a common industry set of frameworks
- Make documents and web site more accessible and easy to understand
- Support related enterprises/distributed value chains by expanding the frameworks' industry footprint
- Develop an increasing rich Business Service Repository aligned with the TM Forum Interface Program
- Integrate the frameworks around common terminology and look/feel.

6. Administrative Appendix

This Appendix provides additional background material about the TM Forum and this document.

6.1. Document History

6.1.1. Version History

This section records the changes between this and the previous document version as it is edited by the team concerned. Note: this is an incremental number which does not have to match the release number

Version Number	Date Modified	Modified by:	Description of changes
0.1	18 Sept 2008	John Reilly	First draft of document
0.2	25 Sept 2008	John Reilly	Second draft based on team feedback.
0.3	2 Oct 2008	John Reilly	Third draft based on feedback.
0.4	19 Oct 2008	John Reilly	Fourth draft with Guide Book (GB) number assigned, updates to terminology and updates based on review with teams.
0.5	30 Nov 2008	John Reilly	Further updates.
0.6	25 Mar 2009	John Reilly	Updates based on member feedback.
0.7			Updates based on internal review.
0.8	12 Apr 2009	John Reilly	Further updates based on internal review.
0.9	May 2009	John Reilly	Member evaluation
1.0	July 2009	John Reilly	Applying members feedback
1.1	July 2009	Ken Dilbeck	Applying Telcordia Comments
1.2	August 2009	Alicja Kawecki	Minor corrections for web posting and TM Forum Approval
1.3	20 November 2009	Alicja Kawecki	Updated to reflect TM Forum Approved status
1.4	January 2010	Ken Dilbeck	Solution Frameworks updated to Frameworx per Marketing
1.5	March 2010	Tina O'Sullivan	Updated to reflect revised release

			number (as per Product Mgmt) and the correct notice statement.

6.1.2. Release History

This section records the changes between this and the previous Official document release

Release Number	Date Modified	Modified by:	Description of changes
1.0			Initial release
1.1			Fix release to address changes from Guide book to technical report and address review comments
8.1	11 March 2010	Tina O'Sullivan	To align with the overall Frameworx release number, as per Product Management.

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6.3. IPR Releases and Patent Disclosures

This document does not involve a claim of patent rights by one or more of the contributors to this document, pursuant to the Agreement on Intellectual Rights between the TM Forum and its members.

6.4. Acknowledgments

This document was prepared by the members of the TM Forum Blueprint project team:

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Review and comments by the Blueprint Team

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