# TM Forum
# Portfolio and Product Management
# Quick Start Pack:
# Frameworx for Defense
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# Executive Summary

The purpose of this document is to demonstrate the benefits of using Frameworx to Defense Organizations. The approach taken was to identify the key issues, or 'pain points', facing Defense ICT departments. The list of 15 issues was reviewed by a number of defense professionals and Organizations and scored/ranked accordingly to what they felt was the most important issues facing Defense today.

The top five issues were correlated against the various Frameworx Case Studies & Management World presentations that have been published by the TM Forum. This identified how similar issues were solved in the commercial world using Frameworx and the benefits realized using this approach.

In conclusion, this report shows that Frameworx offers real benefits to Defense Organizations; for example by aiming for integrated insight in and management of total installed base, reducing operational cost, improving Service Delivery efficiency and improving problem, performance & SLA management.

  

# 1. Introduction

## *1.1. Intended audience*

This Guidebook is aimed at Defense agencies. More particularly this document targets:

- Policy makers that prescribe what best practices and standards to use within the Defense organization.
- Internal ICT service providers that provide the Defense community with ICT services they require to do their work, either being it executing some far away mission or doing office work in the homeland.
- Procurement departments that select & purchase (COTS) network and IT infrastructure and third party (commercial) ICT services needed by the internal Defense ICT service provider(s) to meet the ICT service requirements of the Defense community.

Purpose of this document

The goals associated with the delivery of a service from one organization to a customer can be seen as generic across the majority of industries; given that a service is defined by ITIL as:

> *"...a means of delivering value to customers by facilitating outcomes customers want to achieve without the ownership of specific cost and risks."*

This definition can be applied equally to the voice and broadband services that are provided to consumers by Telecommunications Companies as well as the new car bought from a dealership. But while the goals and aims of organizations in providing services are broadly similar, the processes used differ between industry sectors. Service Management is subsequently defined by ITIL as:

> *"...a set of specialized organizational capabilities for providing value to customers in the form of services."*

This similarity between different commercial market segments has allowed best practice from one industry sector to be applied to different industries enabling improvements; whether through increased efficiency or reduced costs etc.

Within Defense Organizations, while the need to improve margins and increase profits are not applicable, the fundamental challenges to an organization, to drive down costs and improve Service delivery efficiency, particularly where the Services can be commoditized, are still very applicable. Internal Defense ICT service providers are responsible for provisioning and assuring the continuity of the ICT services requested by their internal "customers". The ICT services and

  

supporting resources (network & IT infrastructure) can be owned by the Defense agency themselves or can be obtained for third party commercial ICT service providers.

At first look this seems not different a task than commercial service providers do today when offering services to their customers. However, when taking a closer there are various differences. Some examples:

- The circumstances within which ICT services are to be used by Defense employees can vary a lot, from office desktop use to low bandwidth highly critical field use. Next to that the lifecycle of Defense ICT services is different. Many services are deployed for a limited period of time, then removed and later redeployed again in a different mission.
- Defense agencies tend to more and more collaborate with other Defense agencies and non-military organizations such as NGOs and first responders in a fully federated way. In many cases ICT services and infrastructures are shared among the coalition partners.
- Military Doctrine, a description of the role of the military and how forces undertake campaigns, operations etc., and more over the Policies derived from it, also have an impact on provisioning and integration of ICT Services and Systems. Doctrine and Policy are important in providing the rules and context within which the military can operate; for example, how the different forces work together and with coalition partners. With the size of Defense Organizations it is easy to have conflicting Policies, which in turn can create both personnel and technology barriers. Additionally the military management style, where the military operates and makes decisions based upon operational needs, means funding is not always the final determinate within the decision making process.
- While ICT costs are accounted for within Defense Departments, rarely are Total Cost of Ownership costs calculated and accounted for. In general the budget for procurement of ICT equipment is separate to budget used to pay for the operation of the equipment once in service. This separation of costs mean that the integration costs of ICT equipment are not realized as part of the procurement costs of the equipment. Defense also has extra steps required to integrate / facilitate both the enterprise architecture and security requirements for both Defense and the Service Provider. The ongoing strategic architecture and applications will be the driving force in the future as Defense Departments embark on their IP roadmap, and unless this is captured upfront then there will be the ongoing lag of trying to resolve todays issues as “business as usual”.

Commercial service providers typically refer to best practices and industry standards to help them cut cost, improve efficiency and customer experience, select vendor solutions and better innovate. In the telecommunications industry TM Forum is the leading organization providing such material, most prominently Frameworx a set of best practices. A short introduction on TM Forum and Frameworx can be found in the next sections. In the IT Service Management domain the most referred to set of best practices is ITIL.

  

Best practices are already used within Defense ICT service providers but not the same extend as within commercial service providers. While ITIL is applied in many Defense agencies, the TM Forum material is less well known to many Defense organizations.

This document introduces TM Forum and Frameworx and explains how applying Frameworx (even additionally to ITIL) can benefit Defense service providers in the following ways:

- Reducing operating costs, research and development, implementation cycles, and integration risks
- Maximizing mission assurance by coordinating network performance with mission impact
- Rapidly deploying secure network services – anywhere, anytime, anyhow
- Enabling flexible, federated network services across a vast and diverse infrastructure.

This is achieved in a four step pragmatic approach:

1. Define 15 ICT service management related pain points
2. Determine Top five out of these 15 pain points that have highest priority at Defense agencies
3. Find relevant TM Forum case studies that explain how to tackle these challenges in a commercial context
4. Translate these to the Defense context (if needed)

  

## 1.2. Purpose of this document

The rest of this document is structured as follows. The next two chapters introduce both TM Forum and TM Forum Frameworx. Section 4 discusses the Defense Top 15 ICT service management pain points and how the top five highest priority items have been determined. Section 5 details the top five highest priority pain points, it relates them to TM Forum case studies & Management World presentations that describe how TM Forum Frameworx can help overcome them and explains how this is also applicable for Defense.

  

# 2. TM Forum

With more than 750 corporate members in 195 countries, TM Forum is the world's leading industry association focused on enabling best-in-class IT for service providers in the communications, media, defense, cloud service and smart grid markets. We provide business-critical industry standards and expertise to enable the creation, delivery and monetization of digital services. TM Forum's mission is to continually improve business effectiveness for our members.

Over 90 member companies including Defense Agencies, such as the NATO C3 Agency, DISA, DSTL, their contractors, integrators, and vendors have a distinct voice and collaboration venue within the TM Forum. The TM Forum's Defense Interest Group serves as a global industry community, with the primary purpose of enabling collaboration on key industry management issues of special relevance to defense organizations, including special requirements known as "military unique features" (MUFs), and the identification and development of supporting standards.

By working together as a single community, our Defense members can leverage existing and proven TM Forum best practices and standards, share techniques, and collaborate on and launch new work efforts. It is through the TM Forum's Defense Interest Group that this document was conceived.

  

# 3. TM Forum Frameworx

TM Forum's Frameworx Integrated Business Architecture [FWX] provides industry standard, service-oriented approach for rationalizing IT, processes, and systems that enables service providers to significantly reduce their operational costs and improve business agility.

Frameworx utilizes a service-oriented approach, delivering business agility through component re-use, essential in today's market where service providers need to deliver new services rapidly, changing value chains, and new technologies.

Frameworx uses standard, reusable, generic blocks – Platforms and Business Services – that can be assembled in unique ways to gain the advantages of standardization while still allowing customization and enabling competition at the service level.

Frameworx is built on the TM Forum's NGOSS standard – already widely implemented across the telecommunications industry. Frameworx delivers a comprehensive enterprise IT and business process architecture, and embraces major IT industry standards such as ITIL and TOGAF.

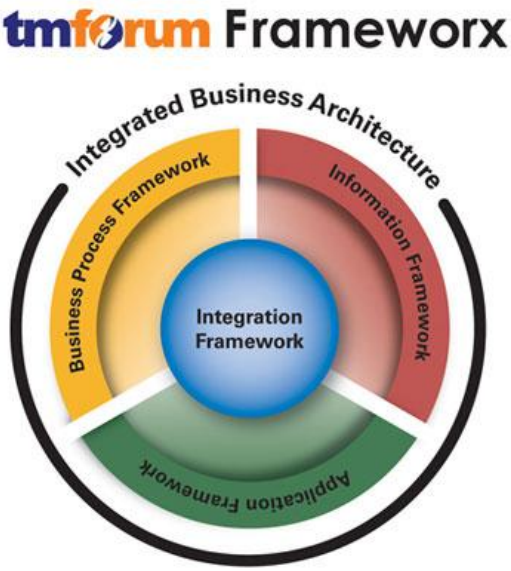


**Figure 1: TM Forum Integrated Business Architecture**

The core components of Frameworx are:

- Business Process Framework (eTOM) – the industry standard process architecture for both business and functional processes

  

- Information Framework (SID) – a common reference model for enterprise information that service providers, software providers, software providers, and integrators use to describe management information
- Application Framework (TAM) – which provides a common language between service providers and their suppliers to describe systems and their functions, as well as a common way of grouping them
- Integration Framework – which delivers a service oriented integration approach with standardized interfaces and support tools

In August 2012, the US Department of Defense released US DoD Instruction 8410-03 on Network Management (http://www.dtic.mil/whs/directives/corres/pdf/841003p.pdf). This policy for its communications suppliers and system integrators that requires TM Forum's Frameworx Information Framework (SID) standard[1] as one of its baseline protocols and standards for exchanging network management data.
The policy also references TM Forum's Guidebook 917, Service Level Agreement (SLA) Management Handbook Release 3.0[2], which provides a full set of definitions used in the field of SLA management, where there is a wide range of interpretations in use in the industry today.

**TM Forum's Conformance Certification Program**
TM Forum's Frameworx is a comprehensive suite of standards that enables a service provider's business to run with maximum agility, simplicity and efficiency. DOD suppliers and system integrators can align their network management solutions with TM Forum standards by undertaking TM Forum's Frameworx Product, Solution and Implementation Conformance Assessments[3], which enable suppliers to verify their conformance to the Frameworx Business Process (eTOM) and Information (SID) Frameworks.
TM Forum grants a TM Forum Conformance Mark to all products and solutions that successfully complete the Frameworx Conformance Certification assessment process and publish their results. TM Forum also announces the completed certification to its membership base of over 65,000 individuals from 900-plus companies around the world. Suppliers are then free to use the Conformance Mark in their own marketing efforts.
For more information about TM Forum's Frameworx Conformance Certification, please go to www.tmforum.org/conformance.

[1] http://www.tmforum.org/InformationFramework/1684/Home.html
[2] http://www.tmforum.org/Guidebooks/GB917SLAManagement/42094/article.html
[3] http://www.tmforum.org/ConformanceCertification/7450/home.html

  

# 4. Top 15 ICT Service Management pain points

## 4.1. Approach

The goal of this document is to demonstrate the benefits of using Frameworx to the Defense community. The approach followed and already introduced shortly in this section is chosen to illustrate the applicability of TM Forum Frameworx as concrete as possible. Instead of writing down a rationale to use Frameworx a set of concrete cases has been identified by which the use of Frameworx is clarified.

This is the used approach to reach the goal defined above in more detail:

1. TM Forum, NATO, UK MOD & TNO have determined 15 of the biggest issues affecting Defense Organizations in the management and delivery of their Communication and Information Services (CIS)/Information and Communication Technology (ICT) to their end users.
2. These 15 issues have been reviewed and ranked according to priority/urgency levels as felt by Defense Organizations and Professionals. A Top 5 of main pain points has been distilled from this feedback.
3. For these Top 5 ICT Service Management challenges TM Forum case studies have been identified in the huge TM Forum case study database that illustrate how similar challenges have been addressed by commercial organizations, using TM Forum Frameworx and what benefits (in terms of efficiency, reduction in the time and customer costs needed to deliver new or enhanced Services to the End User etc.) have been achieved. Additionally the agendas of past editions of TM Forum's conference Management World have been scanned for presentations that cover these top 5 issues.
4. Where required additional explanation is given how the benefits & solutions described in the case studies also apply for the Defense community. As has been said in section 1.1, while there are differences between the way a Commercial Telecommunications Service Provider may run their business compared to the internal Defense ICT service providers, in reality much of the processes, equipment, protocols, and types of services delivered are very similar; be it voice services using VOIP or email services. In looking at the commonalities between Defense and Commercial environments it is possible to see similar issues within both and examples how Commercial Organizations tackled and resolved these issues using industry best practice also show value for Defense organizations. Only there where distinctive Defense characteristics are so prevalent that understanding the Frameworx benefits described from a commercial viewpoint aren't applicable enough additional clarification is given.

## 4.2. Top 5 ICT Service Management challenges

  

The total list 15 of the biggest issues affecting Defense Organizations in the management and delivery of their Communication and Information Services (CIS)/Information and Communication Technology (ICT) to their end users can be found in Annex A. After review and ranking by Defense Organizations and Professionals this list was prioritized to identify the following Defense Industries' top 5 most important issues:

1. How to manage the total installed base of (end-to-end) services and resources. What does everything deployed/added look as a whole?
2. How to create an integrated overview of products, services & resources (networks. Network elements, IT systems, devices)? How to relate & map product offerings, services and comprising resources? How to capture this with service/resource catalogue & inventory management?
3. How to achieve better integration (and/or rationalisation) between national forces or between collation partners? i.e. Comparable systems (similar services) deployed more than once, one for each force.
4. How to apply / make use of an enterprise architecture?
5. How do I define what performance information I need from my service provider?

  

# 5. How Frameworx addresses the top 5 Defense ICT Service Management issues

For the top 5 issues that have been identified and reviewed by the Defense Community, listed in section 4.2, one or more Case Studies from the TeleManagement Forum website or a presentation presented at one of the previous Management World conferences will be used to show how Frameworx has been used to resolve a similar problem and what benefits are realized from taking that approach. Further clarification on how this applies to the covered Defense issue is given when required for better understanding.

The Case Studies used in this document can be found on the TeleManagement Forum website by following this link:
http://www.tmforum.org/ResearchPublications/7097/home.html?q=Case_Studies#TRCPublications/LIST

Agendas from following Management World conferences have been scanned:

- 2009: http://www.tmforum.org/PreviousEvents2009/ManagementWorld2009/6012/home.html
- 2010: http://www.tmforum.org/PreviousEvents/ManagementWorld2010/7867/home.html
- 2011: http://www.tmforum.org/PreviousEvents/ManagementWorld2011/9414/home.html
- 2012: http://www.tmforum.org/PreviousEvents/TMForumsManagement/11848/home.html

## *5.1. How to manage the total installed base of (end-to-end) services and resources. What does everything deployed/added look as a whole?*

### Issue description

Knowing what resources make up your network & IT landscape is key to being able to manage Service Delivery capacity and to maintain the security and integrity of the network. Comptel's approach, using Frameworx, greatly improved one Service Provider's ability to manage their resource Capacity:

  

## Related case study: Leveraging Fulfillment to break away from the Business silo maturity trap – Enabling service innovation and growth[4]

*"When the first business use cases were drafted it became apparent that because of an aggressive expansion plan, the view and knowledge of the physical and logical resources (i.e. the network) was fractured as it was held in a number of propriety systems that lacked interconnectivity and consistency. Many tasks for Service Provisioning and Service Assurance activities had to be accomplished manually creating an opportunity for frequent mistakes. Comptel together with the Communications Service Provider (CSP) identified the criticality of streamlining the process in order to obtain an accurate and consolidated view on the physical and logical resources (Figure 3) that would facilitate the decoupling of the business requirements from technological constraints and would help lay solid foundations for the transformation effort.*

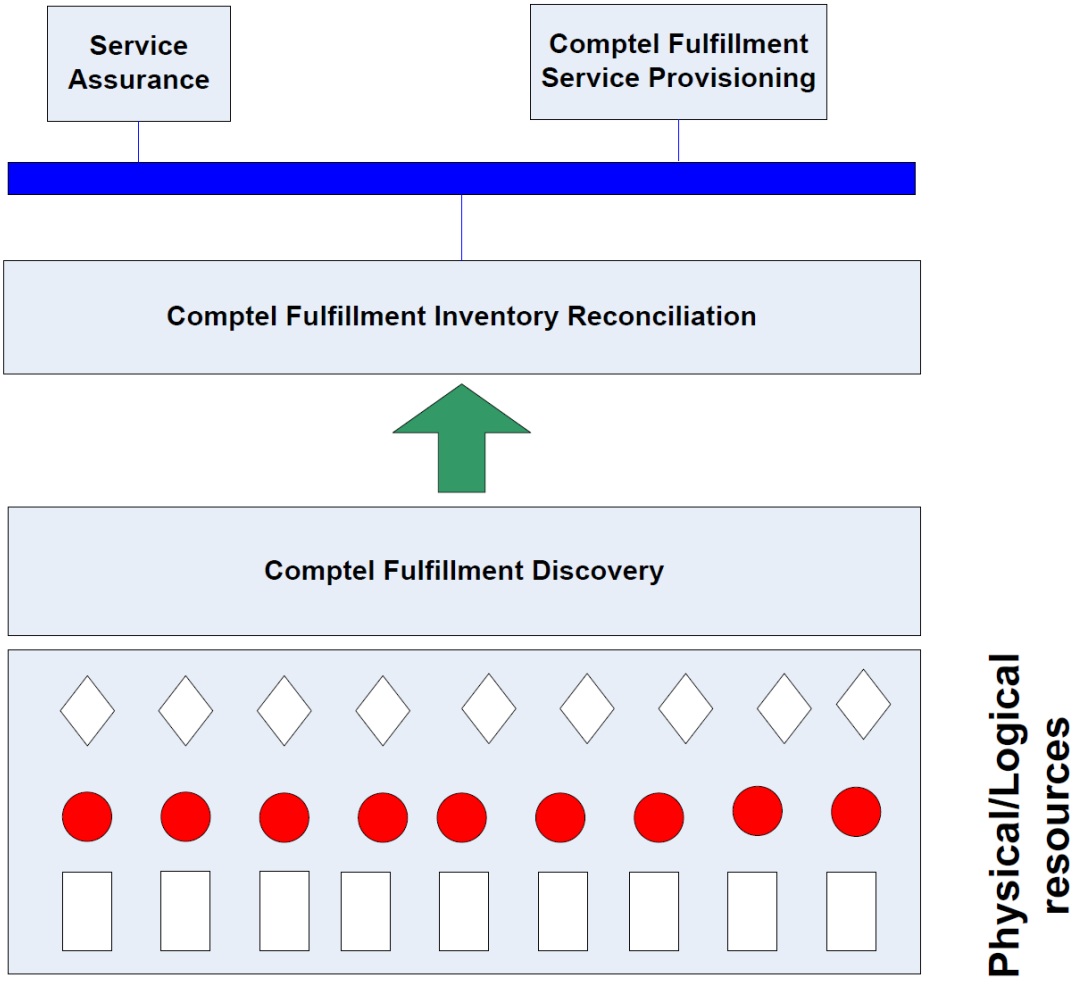


**Figure 2: Consolidated view on physical and logical resources**

[4] http://www.tmforum.org/casestudies/LeveragingFulfillment/46666/article.html

  

***Physical and Logical Resource Discovery***

*Today, common to almost any Telecoms Service Provider in the world, physical and logical resources are supported by a number of different vendors and platforms which interoperate by following a number of standards and guidelines. As part of an aggressive expansion plan, the CSP was increasing its infrastructure by rolling out hundreds of new physical and logical resources every month. With vast geographical areas to cover, and as is common practice in the industry, the process was outsourced to multiple subcontracted third parties throughout the country that reported on progress manually.*

*A mechanism to automatically identify new resources as they came on-line had to be devised in order to establish a comprehensive view and develop an understanding of how they interrelated with each other (both physically and logically), effectively inventory reconciliation. This would prove an interesting and challenging task as no single approach could accomplish such a goal given the inconsistencies between platforms and vendors.*

***Solution:***

*The greatest contribution provided by the TM Forum Solution Frameworks is the experience with industry best practices summarized in its proposed models and documented in the Application Programming Interfaces (APIs). When a CSP embarks on a transformation journey, although it may be time consuming at first, it is extremely advantageous when all stakeholders from different backgrounds and interests share a common language and most importantly a common set of goals. The TM Forum Framework reference guides save valuable time and ensure that important aspects of the solution are not accidentally overlooked whilst encouraging an open architecture that reduces integration efforts.*

***Results:***

*The initial results provided the CSP with the potential for extremely powerful tools helping to reduce manual intervention, cutting costs, pruning errors in day to day operations and increasingly significantly, accountability and control of third party systems and companies operating in the network. It established the foundations of sustainable and scalable growth in line with business expansion plans. The specific details are as follow:*

***Discovery Client Application:***

- *Extremely high Discovery success rate (est. over 98%) – never achieved before in a multivendor network*
- *Unprecedented consolidated view on the physical interoperation (topology)*
- *Unprecedented view of logical resource availability and deployment (plug-in Graphical User Interface), improving overall responsiveness to network operational problems*
- *A reference point for Service Assurance systems helping to improve monitoring*
- *Increasing accountability on deployments exercised by third parties*

  

***Configuration Management:***

- *Faster, safer and more accurate configuration application*
- *Unprecedented support for configuration auditing, allowing the CSP to quickly spot anomalies in order to take corrective action*
- *Capability to Backup and Restore devices at will, regardless of the platform or hardware vendor (vendor/platform agnostic)*
- *Capability to control terminal access to resources (plug-in Graphical User Interface)*
- *An extremely rich set of reports covering a variety of subjects from capacity management to the detection of anomalies on physical and logical resources "*

## Use of TM Forum Frameworx

The use case illustrates a couple of uses of TM Forum Frameworx:

- Common language: This is the most used reason for using TM Forum Frameworx. The simple reason for that is, that it's a quick win. Becoming familiar with Frameworx basics already allows you to talk in the same "language" as other people involved with the same topics within and more importantly outside of your organization. It eliminates discussion on terminology, definition and different people interpreting used terms differently.
- Scoping: Frameworx is a powerful tool to scope projects, tasks, etc. Business Process Framework processes at higher abstraction level (level 0 to level 2) and Information Framework Aggregate Business Entities allows you to quickly scope a project process & information wise, not just for the technical people who do the engineering/development work but even from a project management perspective. On top of that it also gives you a checklist to ensure yourself you haven't overlooked some aspect or other.
- Enterprise wide information definition, structuring, decomposition & relating, reducing integration cost: Frameworx, most importantly Information Framework, offers a complete reference information model to start from that already takes care of how to model the installed base information and more importantly how to relate it together.
- Integration Framework: TM Forum makes available a library of management interface specifications to integrate management systems based on the Information Framework.

## Relevance to Defense

This case study translates back to the Defense specific issue as follows. The aim to have an integrated view of the total installed base is identical in this use case as it is for this Defense top 1 issue.

Another aspect can be translated from this CSP oriented case study to Defense perspectives. This use case talks of "rolling out hundreds of new physical and logical resources every month" which isn't typically a Defense scenario. However it can be easily envisioned that in Defense

  

scenarios resources are added and removed a lot during the overall network lifecycle. Even more so, complete networks and services offered over them are deployed, torn down and redeployed many times. As a result the dynamics between this CSP case and Defense scenarios are comparable.

### Additional Use cases or presentations

The following case study by Vodafone D2 confirms the discussed case study above: "Next-generation service assurance improves operational efficiency" One of benefits of using Frameworx listed by the case study is "The employment of SID (Information Framework) P-CFS-RFS-R model in CMDB product is perceived as a way to achieve further cost reduction due to the common service-resource model: this model can be used to support service assurance and service fulfillment processes. Apart from cost reduction, having a common service model in the CMDB should reduce time-to-market for new services. Put another way, the CMDB's common service resource model can support the entire service lifecycle".

A Management World 2011 presentation "Inventory & The Customer Experience" by Virgin Media also illustrates how TM Forum Frameworx was used "To effectively embed inventory management into business as usual processes, creating an operating environment where data is effectively correlated across 'domains'" and "A Complete, Accurate and Available Record of all Deployed and Planned Network Resources both Logical and Physical".

## *5.2. How to create an integrated overview of products, services & resources (networks, Network elements, IT systems, devices)? How to relate & map product offerings, services and comprising resources? How to capture this with service/resource catalogue & inventory management?*

### Issue description

This issue poses a number of interrelated questions; how does an organization relate Products (sold to customers), to Services (delivered to customers) and to Resources (used to deliver Services) and leverage this to manage Service and Resource capacity and configuration. The organization must be able to offer Products, through catalogs, to customers and understand what the delivery of these products mean in terms of Service configuration and Resource capacity. The key to delivering and managing the performance of End to End Services within a Federated Service environment is to understand how a Service uses the underlying Resources. This has been realized by Qwest:

  

## Related case study: Qwest cuts operational costs, gets products out there faster[5]

*"…wanted to transform its service delivery to shorten the time-to-market for new products, including cloud services, reduce its operating costs, and have visibility and traceability from products to services to resources. It was also determined to reduce individual service component redundancy and enforce Qwest's high standards for the overall customer experience. To reduce investment risk and prove the viability of what it wanted to achieve, the operator and its partners turned to TM Forum's Frameworx and Catalyst Program before it embarked on the transformation. Within a year of the deployment Qwest saw a 4 percent increase in revenue, a 5 percent cost reduction, a 25 percent improvement in new product deployment cycle times, and a decrease in unique provisioning and assurance job steps.*

***Reducing risk:*** *To transform service lifecycle and service delivery methodologies to meet rapidly changing industry and business pressures, Qwest needed to:*

- *streamline service delivery processes;*
- *speed concept-to-cash cycle times;*
- *create visibility and traceability from products to services to resources;*
- *reduce individual service component redundancy;*
- *deliver best-in-class service levels.*

*Following Frameworx best practices and standards, Qwest implemented the following solutions to meet its service delivery transformation goals:*

- *order management: automated sales order entry and order status visibility; centralized service and product specifications; configuration tools; consistent product and service orders; accurate quotes;*
- *product information manager: product lifecycle management and workflow; rationalized product and service definitions; real-time product definition simulation and validation;*
- *active service catalog: logical integration of product and service layers; model resources and services; drive provisioning workflow automation and inventory; rapid update of product offerings.*

***The results:*** *Qwest's approach to participate in and contribute to the TM Forum Community led to a deployed service delivery platform that exceeded expectations, with both quantifiable and repeatable results. Toland confirms, "Frameworx absolutely enabled us to shorten product definition, deployment, and assurance times, improve our cycle times and operational environment, as well as decrease provisioning time. The result was faster delivery of consistent, reliable, and competitively priced services – the real measure of our success – with excellent customer experience." Qwest believes TM Forum Frameworx Business Process Framework (eTOM), Information Framework (SID), and Service Delivery Framework are exactly what it needs to achieve practical application and fast return on investment. Within the first year,*

[5] http://www.tmforum.org/ThursdayNovember11/QwestCutsOperational/43903/article.html

  

*Qwest used Frameworx in conjunction with its own proprietary methods to realize a 4 percent revenue increase, 5 percent cost reduction, 25 percent cycle time improvement for new product deployment, and an overall decrease in unique provisioning and assurance job steps."*

### Use of TM Forum Frameworx

The use case illustrates a couple of uses of TM Forum Frameworx:

- Business Process Framework: Process design (Service Delivery Process)
- Information Framework: Definition of products, services, resources
- Information Framework: Integrated visibility and traceability from products to services to resources

### Relevance to Defense

The solution set out in the Case Study, implemented an active Service catalog which, using Frameworx, provided a: "…logical integration of product and service layers; model resources and services; drive provisioning workflow automation and inventory…" As has been stated organizations must be able to offer Products to customers and understand what the delivery of these products mean in terms of Service configuration and Resource capacity. To be able to do this organizations need an integrated view of Products, Services and Resources and Frameworx, particularly through the Information Framework define this relationship and through the implementation of Frameworx realizes this relationship.

As such the above case study illustrates how to cover most part of the no.2 issue "5.2. How to create an integrated overview of products, services & resources (networks, Network elements, IT systems, devices)? How to relate & map product offerings, services and comprising resources? How to capture this with service/resource catalogue & inventory management? The case studies and presentation listed in the no.1 issue in section 1 also address the "inventory management" aspect of this issue.

## *5.3. How to achieve better integration (and/or rationalization) between National Forces or between coalition partners?*

### Issue description

There are two aspects to this issue:

1. "Active" integration of multiple partners involved in a shared operation.
2. Integration "transformation" where multiple forces transformed into one.

"Active" integration is one of the biggest issues facing Defense Organizations. Interoperating with other National Forces and/or other coalition partners, who may not be Defense Organizations, when on Operations is essential these days. In many cases neither party may never have worked together before, but even where they have worked together there may still be issues of integration, interoperability and information sharing. Con Hem, a Swedish Service

  

Provider, is using Frameworx to streamline operations and software platforms across departments and partners

The second development that should be familiar for Defense organizations is the transformation from multiple, strictly separated, forces to much more integrated forces. This kind of transition also requires the ICT services and supporting resources (Networks, Servers, Management systems) to be integrated. This integration needs to be done from a functional perspective where the different forces now need to have access to a broader set of shared ICT services originally originating from the several forces. And the integration needs to be done from a cost perspective where duplicate functionality/resources should be rationalized.

The first type of integration is very defense specific. Current Frameworx releases still have too much of a commercial business scope in mind to really address this issue fully. However The TM Forum's Defense Interest Group has been started with exact that purpose to update TM Forum standards and most importantly Frameworx to even better address the Defense community. A first step towards this exact issue has been taken with the 3 phased Catalyst project "Secure Federated Service Management" that resulted in "TMF866, Federated Service Management for Defense (Catalyst) Blueprint, Version 1.2" that explains to what extend the current version of Frameworx already can help solving this issue.

For the integration "transformation" topic many related TM Forum case studies and presentations exist:

- Integration of the ICT resources from multiple (acquired) organizations like the "Com Hem" case study 1 below
- "All IP" transformations where ICT services from different organizations are integrated over a single overlay network
- Rationalization use cases where mainly the Application Framework is used to draw the current OSS/BSS landscape and identify overlap and white spots with the aim to significantly reduce the amount of systems (and associated cost). Case study 2 gives an example.

## Related case study 1: Enabling IT to play a central business and operational role[6]

*"Private equity funds are powerful players in the European multi-service operator (MSO) market and they expect their investments in those operators to pay serious dividends. Delivering value to shareholders and customers, while transitioning operations and integrating new companies is a big task, particularly in such an IT-centric company. Standards, including TM Forum's Frameworx, have played a crucial role in Com Hem's success throughout these many changes.*

[6] http://www.tmforum.org/casestudies/EnablingITtoplay/47127/article.html

  

*Com Hem (a play on the Swedish phrase kom hem – come home) is the largest multi-service operator in Sweden, offering telephony, broadband and TV services. It is connected to about 40 percent of Swedish homes through coverage of 35 cities and has 1.77 million subscribers.*

*The systems and infrastructure that enable Com Hem's business are clearly crucial elements in its remarkable success. Hans Hedström is Senior Advisor on Information Systems at Com Hem and leads the architecture team, which he says is primarily about information, integration and deep involvement with the process development people.*
*TM Forum Frameworx is the foundation for projects right from the start at Com Hem. Hedström states, "The management team's starting approach is always to look at which part of the [Forum's] Business Process Framework is relevant to this project. It's a good way of checking whether we've forgotten anything. That is a big part of why a reference model is so useful."*
*He adds, "If you deploy TM Forum Frameworx before work starts on a project, as a sort of umbrella over it, it has a fundamental influence. For big and small projects, it helps you work out resources you need, which might not be obvious from the initial scoping exercise."*

*Com Hem also has partner relationships across their service delivery value chain that benefit from leveraging Frameworx, with a particular focus on TM Forum's Business Process Framework (eTOM) in the initial stages. Hedström continues, "Where there is a good business case we build our own infrastructure, otherwise we lease dark fiber and other links. So when we are launching a new product, let's say a new type of access, we need to provision the service on someone else's network. We need to establish what use cases we need to support and which processes to make the service work across our two organizations.*
*"We divide the use cases in Business Process Framework into process areas, for example, Com Hem puts customer relationship management, fulfillment and order handling in an end customer business, customer management and customer order domain. Com Hem has applied Frameworx both 'out of the box' and also with their own modifications to fit its needs – just how Frameworx is designed to be used."*
*"From the start, we invented our own domain model, Com Hem's own version of the Forum's Application Framework (TAM), if you like, which has links to the Business Process Framework and the Information Framework (SID). Use cases within our Application Framework are divided into domains that are very well aligned with the Business Process Framework, so all our use cases and documents are aligned to process, application or information domains.*

*Hedström says, "Frameworx is customer-centric [service provider-friendly] and vendors support it. It is also aligned to other major frameworks including TOGAF, service oriented architecture and ITIL." It can also be used in conjunction with other standards and best practices.*
*TM Forum's Information Model is used as the base for Com Hem's own reference model, CHRIM (for Com Hem Reference Information Model). For the Market, Product and Customer domain it is divided into two parts to apply to business as well as residential customers and products.*
*Hedström says, "The benefit is that CHRIM, together with our Domain Model, gives guidance for our integration designers and developers what service oriented architecture-services and*

  

*operations as well as what information should be used in different integration flows. That gives us a 'self governed' integration patterns across all developers.*
*He concludes, "The Forum's models have helped us see the whole systems and also provide a good way of dividing and mapping business requirements into different domains and solutions so we can see that 'we need this solution to work with this, so we should build it in-house or we should outsource it'. It helps us make better business decisions and stops us leaving anything out of the product lifecycle."*

Additionally UPC gave a presentation at Management World Dublin 2011[7] describing how Oracle leveraged TM Forum Standards to integrate the various national Service Delivery companies into one international Service Delivery Organization.

## Use of TM Forum Frameworx

TM Forum Frameworx were used in many ways in this use case:

- Scoping & decomposition: Define project scope and delimit areas that have to be elaborated
- Common Language: Frameworx terminology is used to refer to all important topics
- The Information Framework has been used as a basis for the Com Hem Information Model
- Identification of distinct functional domains to facilitate vendor/solution selection
- Using Frameworx as reference models the solution architecture Enterprise architecture could be plotted in the right position(s) in the (TOGAF) enterprise architecture

## Related case study 2: Application of Frameworx for COTS-Based Business Transformation[8]

This case study is about the Frameworx [NGOSS]-based solution implemented at a US federal government organization (hereafter referred to as "the Organization"). The Organization provides telecommunications and network services to many organizations within the government. In other words it plays the role of an internal Telco and provides services on a par with other Tier 1 commercial providers. As part of an organization-wide technology refresh, the Organization chose to update their OSS suite and implement a SOA-based architecture. The result was an enterprise-wide business transformation. This transformation was expressly based on TM Forum and Frameworx [NGOSS] principles.

In the framework of the legacy fulfillment, inventory, and assurance systems update, the Organization's

- OSS architects were tasked to support the following top-level business values:
- Build a Service Oriented Integration environment where data interfaces are published, self describing, and reusable

[7] http://www.tmforum.org/PreviousEvents/ManagementWorld2011/9414/home.html
[8] http://www.tmforum.org/casestudies/ApplicationofFrameworx/41973/article.html

  

- Use common, shared information exchange schema for application integration
- Support dynamic, on-demand provisioning and activation of voice, video, and data services
- Provide end-to-end visualization of the network
- Reduce order to fulfillment cycle time
- Provide better order tracking transparency and reporting
- Automate processes and facilitate ongoing process re-engineering
- Create interoperable and interchangeable OSS components using one data interface per
- application
- Provide integrated, real-time situational awareness of the network

The Organization's challenges included eliminating legacy systems, streamlining and automating the order fulfillment process, centralizing inventory data, and finally, improving the customer experience.

The Organization made a decision to adopt TM Forum constructs like Business Process Framework and Application Framework to provide the solution blueprint to address Network Inventory, Discovery and Reconciliation, Service Inventory, and Service Provisioning and Activation.

## Use of TM Forum Frameworx

All components of TM Forum Frameworx were used:

- The Organization's OSS architecture reflects major elements of the operations side of the Business Process Framework. A siloed inventory and design system was replaced with a true Resource Management Layer. The Resource Layer includes modules for Resource Inventory, Design and Planning, Discovery and Reconciliation, and Outside Plant. The most sweeping change was the addition of a true Service Management Layer. A technically outdated system was replaced with modules for Service Inventory and Service Provisioning and Activation. At the center of the Service Layer is a Services Catalog with specific constructs for Customer-Facing and Resource-Facing service templates.
- TM Forum's Information Framework was used to accurately describe various business entities engaged in the process of end-to-end service delivery.
- The utilization of TM Forum's Applications Framework allowed for effective classification of hundreds of legacy applications by mapping their roles to Application Framework's components. It also facilitated design migration and integration strategy development.
- A series of TM Forum Integration Framework interfaces for standards-based integrations was realized in the OSS transformation project:

  

## 5.4. How to apply / make use of an enterprise architecture?

### Issue description

Many Defense Organizations make use of Enterprise Architectures, for example DODAF, MODAF, TOGAF etc., to support a number of activities for example capability gap analysis. These architectures can also be used to describe the relationship between Services, Equipment, Doctrine and Concept of Operations or to enforce design policy and requirements to ensure integration and inter-operability. This issue leads to a number of related issues:

- During product development/innovation: How to design/apply conceptual/logical/physical architectures. How to go through the steps from high level concept to "this is the list of things you need"?
- How to explain the benefit of enterprise architecture & make enterprise architecture understandable and practical, not only for architects, but also for other business stakeholders like operations & acquisition management?
- How do you enforce/realize enterprise architecture(s), both internally and with external supplier(s)?

### Related case study: Transforming IT systems to support new business models[9]

Microsoft, a TM Forum Member since 1994, used Enterprise Architecture Tools and Frameworx to deliver its Business Online Services:

*"In 2008, Microsoft launched Business Online Services which includes online versions of business productivity tools such as Exchange Online, SharePoint Online, Office Communications Online, and Office Live Meeting. To accomplish this, the company integrated eight separate vendor solutions to offer 20 online services in just eight months from project start to finish: a Herculean task the company says it could not have achieved without extensive use of TM Forum's Frameworx, which played a big part, right from the start. Indeed Microsoft says that the use of Frameworx reduced the implementation time to commercial launch by nine to 12 months.*

*The role of TM Forum Frameworx: In support of Online Services, Microsoft's OSS/BSS deployment includes service lifecycle management, fulfillment, service assurance, and charging/billing functionality. It includes third-party systems as follows:*

- *MetraTech's hosted software package for order-to-cash, professional services, and hosting;*

[9] http://www.tmforum.org/CaseStudies/10932/home.html#TRCCaseStudies/Link46019

  

- *RMS deals with credit card charge-backs and credit collections;*
- *Cybersource provides a secure credit card payment gateway;*
- *Arvato handles partner payment fees;*
- *Arvato also provides services for Tier 1/Tier 2 customer and partner care;*
- *SAP offers revenue recognition;*
- *Rightnow supports ticketing and reporting;*
- *WorldTax provides tax calculation services.*

## Use of TM Forum Frameworx

Microsoft used TM Forum exactly as it is intended, an integrated business (reference) architecture. They achieved this as follows.

- Business Process Framework*: Microsoft adapted the Business Process Framework's processes into its architecture. They were modeled in an internal enterprise architecture planning tool that facilitated a coordinated implementation across multiple groups.*
- Information Framework*: This was integral to the design of contracts between the various components that make up the Microsoft BSS/OSS to support Online Services. The Information Framework was the starting point to define the data structures associated with the architecture.*
- Application Framework*: Microsoft used an internal enterprise architecture modeling methodology called Solution Domains. The Application Framework was used as the starting point to define the solution domains that Microsoft used to model the entire BSS/OSS architecture.*
- Integration Framework*: Published application program interfaces (APIs) and MTOSI served as a starting point for Microsoft's implementation. This enabled solution designers to generate actual contracts between application framework components when modeling business processes. In addition, the Microsoft implementation considered the work of the Architecture Harmonization and TIP in the formulation of its methodology to design and implement its BSS/OSS architecture."*

## Relevance to Defense

As discussed above Defense organizations are more and more using enterprise architectures to structure their "business", processes, information and infrastructure. As has been said Frameworx has been aligned to a number of other frameworks and standards. This is demonstrated in the TM Forum Technical Report 'Exploring synergies between TOGAF and Frameworx' v1 0, (http://collab.tmforum.org/sf/go/doc13068?nav=1), where it is shown how Frameworx gives you the reference architectures to use when building some of the TOGAF architecture components for the ICT space.

  

## 5.5. How do I define what performance information I need from my service provider?

### Issue description

Any End to End service which uses a Third Party to provide part of that service, be it part of the network backbone or a cloud storage capability will require a Service Level Agreement with that Third Party. This is to ensure that the service provided meets certain requirements (SLA) with that Third Party. This is to ensure that the Third Party Service provided meets the requirements of the End to End Service. In some cases the SLA will just cover the requirements of a Service from point A to point B with no metrics specified in other cases the SLA will specify performance metrics (Service Availability, Packet Loss Ratio etc.) that have to be met. While no Case Study defines what metrics should be measured, or reported through a SLA, to assure the performance of an End to End Service; China Unicom used Frameworx to support the development and implementation of Service Level Management through the definition and monitoring of Key Performance Indicators (KPIs)

### Related case study: Turning chaos into harmony generates a billion dollars [10]

*"China Unicom is the country's second largest mobile network operator with more than 160 million subscribers, as of August 2010. Before the Unified Voucher and Top-up Management Network Solution project, China Unicom had 55 different interactive voice response lines, 120 accounts receivable systems, and 200 different kinds of vouchers for topping up service accounts across the mainland. In addition, operations in each region were unique for different user types and services (wireless, wireline and broadband). To streamline the service operations from end-to-end, the operator developed the Unified Recharging Service Network, using TM Forum's Frameworx, to integrate these disparate channels and provide a consistent user experience. Using Frameworx cut two months off the design phase of the project, which spanned over 268 BSS/OSS systems. The service has achieved 99.9 percent service availability and gained around a billion dollars a year in new revenues and cost savings.*

*China Unicom needed to streamline its various service top-up operations and offer a consistent, simple customer experience. Before starting its Unified Recharging Service Network project, there were 55 separate interactive voice response (IVR) service numbers for customers to call, 120 accounts receivable (AR) systems and 200 different types of recharging voucher cards in use across the mainland.*
*The recharging processes themselves varied widely across China Unicom's 31 provincial subsidiaries: Operations in each region were unique for different user types and services (wireless, wireline and broadband).*

[10] http://www.tmforum.org/casestudies/Turningchaosintoharmony/46012/article.html

  

*This situation caused all sorts of problems for the service provider and customers alike. For instance, there was no single voucher that could be used by a customer to recharge all the services on offer and customers who used services in one province couldn't top up their accounts while in another. Nor was there a unified portal for recharging through multiple channels, such as SMS, online, and IVR.*

***Service contracts:** China Unicom used the concept of service contracts, derived from the Forum's Integration Framework, to define in detail the services passing through the exposed interfaces and to streamline process interactions and monitoring. It also used Frameworx's methodology of service definition and the service oriented architecture (SOA) governance to help with the design of an holistic SOA-style architecture for the integration of multi-system networking.*

*The use of the service contracts concepts and the methodology derived from Frameworx and the Integration Framework cut the design time by two months, resolving holistic architectural issues and the processes and service definition. From this, China Unicom developed a distinct 'heart-beating' mechanism that spans more than 268 BSS/ OSS systems that also draws on the Forum's service level agreement management and SOA governance. It is designed to guarantee the end-to-end service quality an average of 99 percent service availability by defining and monitoring distributed key performance indicators.*

*The heart-beating mechanism collects self-status information from management module deployed in the recharging network nodes in the 31 modules. It also collects status information about the local BSS/OSS systems in each province by initiating simple service transactions.*

*The central management system deployed collects relevant information of each provincial node through periodic management messages over HTTP protocol. Meanwhile, the central system broadcasts the status information about the provinces to each province. The communications within the network of distributed BSS systems is organized as a set of short connections, with a lot of built-in redundancy; that is information is not lost if a single built-in link goes down."*

Additionally Belgacom gave a presentation at Management World Dublin 2012[11]on how they developed Service Level Agreements across all professional solutions to create a converged offering for all professional customers while at the same time balancing the customer service level requirements with the operational capabilities of the delivery organization.

## Related Catalyst

Management World Americas 2012 the Measuring Performance Success Catalyst[12] is to demonstrate how the latest TM Forum Performance Management (PM) interface is used to build a real-life assurance architecture to monitor services based on performance data received from both network and service layers.

*"With the proliferation and rapid evolution of Service Quality Management and Customer Experience Management needs and systems, Performance Management is a key topic where a strong need for standardized interfaces exists. This need intensifies with the introduction of*

[11] http://www.tmforum.org/PreviousEvents/TMForumsManagement/11848/home.html
[12] http://www.tmforum.org/InsideBestPractices/13853/home.html#TRCPublications/Link49944

  

*Mobile Media Services where the user experience is highly affected by performance degradation.*

- *Assurance of mobile media services, based on performance data supplied from various network and service sources such as media servers, the transmission network, mobile RAN and mobile core network.*
- *Unified Performance Management of service delivery chain resources providing service-context information to network engineers*
- *Use of the new harmonized TM Forum Performance Management (PM) interface harmonization work for multi-vendor, multi-technology assurance from the network up to the service quality and customer experience layers.*

*Presentation of a meaningful and coherent status of the monitored services using correlated Key Performance Indicators from the various data sources."*

## Use of TM Forum Frameworx

China Unicom made use of the Service Contracts to support the definition of the process interactions and monitoring. They also made use of Frameworx's methodology for Service definition and the Service Oriented Architecture (SOA) governance to help with the design of a holistic SOA style architecture which supported the integration of multiple systems.
The TM Forum have also published the Service Level Agreement Handbook[13] which *"provides a full set of harmonized definitions of terms used in the field of SLA management, where there is a wide range of interpretations in use in the industry today. Other objectives that have been addressed included support for modern, complex services, especially those that are not inherently networking services and those that are provided via a Value Chain of Service Providers. It should be capable of supporting SLA lifecycles for any service or product."*

## Relevance to Defense

Much like the federated environment, China Unicom needed to monitor the whole of its environment to be able to assure the delivery of its Services. Its approach, to use the concept of Frameworx Service Contracts, greatly helped the streamlining of process interactions and monitoring. At the same time it developed a holistic SOA architecture to integrate the various systems. This architecture allowed China Unicom to gather performance for multiple sources and understand the end to end performance of its various systems. Key to being able to do this China Unicom used the Frameworx methodology support the design of the SOA architecture.

[13] http://www.tmforum.org/Guidebooks/GB917SLAManagement/42094/article.html

  

# 6. Survey Results

While there were only three responses to the online survey, these have been augmented with responses from the UK MOD, NATO and Dutch Defense. The UK MOD provided a top six list of issues, while Dutch Defense provided a top five list. The tables below detail the results from all the different sources.

Table 4 shows the survey results. As can be seen the top five issues are:

1. How to manage the total installed base of (end-to-end) services and resources. What does everything deployed/added look as a whole?
2. How to create an integrated overview of products, services & resources (networks. Network elements, IT systems, devices)? How to relate & map product offerings, services and comprising resources? How to capture this with service/resource catalogue & inventory management?
3. How to achieve better integration (and/or rationalisation) between national forces or between collation partners? i.e. Comparable systems (similar services) deployed more than once, one for each force.
4. How to apply / make use of an enterprise architecture?
5. How do I define what performance information I need from my service provider?

It is fair to say that these issues represent the complexity of Service Management within Federated Service environment and the necessary integration of Systems and Services required to support joint/collation operations.

  

| Issue: | Percentage of respondents who rated the issue as: | | | | Average Ranking |
|---|---|---|---|---|---|
| | Very Important | Important | Not Important | Not an Issue | |
| Demand management. How to manage & translate the demand for communication, information services & business process automation into actual product offerings. | 33.3% | 66.7% | | | 3.33 |
| How to achieve better integration (and/or rationalisation) between national forces or between collation partners? i.e. Comparable systems (similar services) deployed more than once, one for each force. | 33.3% | 66.7% | | | 3.33 |
| When implementing a centralised Management System, with an holistic approach, how to separate information details at different management levels. What best practices, recommendations and standards exist, e.g. TM Forum? | 33.3% | 66.7% | | | 3.33 |
| How to apply / make use of an enterprise architecture? | 22.2% | 55.6% | 22.2% | | 3.00 |
| How to create an integrated overview of products, services & resources (networks. Network elements, IT systems, devices, ...)? How to relate & map product offerings, services and comprising resources? How to capture this with service/resource catalogue & inventory management? | 33.3% | 33.3% | | 33.3% | 2.67 |
| How do I become (more) agile? How can I change/improve services in a timely manner? (Timely as when needed not as soon as possible.) | 33.3% | 33.3% | | 33.3% | 2.67 |
| How do I define what performance information I need from my service provider? | 16.7% | 33.3% | 50.0% | | 2.67 |
| What are responsibilities / level of control do / should I still have when I look to outsource a service? | 16.7% | 50.0% | | 33.3% | 2.50 |
| How do I determine root causes of service/resource problems/incidents? | | 66.7% | 33.3% | | 2.67 |
| How to manage the total installed base of (end-to-end) services and resources. What does everything deployed/added look as a whole?<br>Example: How do I compare the as-is with the “should-be”. I have been invoiced for 100 PCs, and I can only see 90 (or more i.e. 101)? Who/what flags such delta? Have I got awarded with 1 extra PC, or someone else is plugged on my network? | | 66.7% | 33.3% | | 2.67 |
| How do I incentivise/encourage service innovation (e.g. driven by technology improvement)? | | 66.7% | 33.3% | | 2.67 |
| Scalability. How to ensure that outsourced service(s) sufficiently allow for significant & dynamic growth or shrinkage in usage, reach…? | | 66.7% | 16.7% | 16.7% | 2.50 |

| Issue: | Percentage of respondents who rated the issue as: | | | | |
|---|---|---|---|---|---|
| | Very Important | Important | Not Important | Not an Issue | Average Ranking |
| Benefit capture, benefits mapping, maturity management. How do you achieve / measure / make sure there is an improvement in the Enterprise (Defence) by improving my IT service. | | 66.7% | | 33.3% | 2.33 |
| How to educate users on the availability, the potential and use of new services? | | 33.3% | 66.7% | | 2.33 |
| SLA: How to define an SLA and make sure it's measurable and has a defined link to service impact. | | 33.3% | 33.3% | 33.3% | 2.00 |

**Table 6-1 Online Survey Results**

| Priority | Issue | Total Mark |
|---|---|---|
| 1 | What do all the end to end services look like when added together | 6 |
| 2 | How do I define what performance information I need from my service provider | 5 |
| 3 | How do I get agility? How can I change/improve services in a timely manner | 4 |
| 4 | Translate the demand/requirement into product(s) that can be delivered to customer(s). Focusing on IT product | 3 |
| 5 | How do I incentivise/encourage service innovation (may be through technology improvement) | 2 |
| 6 | Benefit capture, benefits mapping | 1 |

**Table 6-2 UK MOD Issue Ranking**

| Issue: | 1st Responder | 2nd Responder | 3rd Responder | Total Mark |
|---|---|---|---|---|
| How to create an integrated overview of products, services & resources (networks. Network elements, IT systems, devices, ...)? How to relate & map product offerings, services and comprising resources? How to capture this with service/resource catalogue & inventory management? | | 5 | 5 | 10 |
| How to manage the total installed base of (end-to-end) services and resources. What does everything deployed/added look as a whole?<br>Example: How do I compare the as-is with the "should-be". I have been invoiced for 100 PCs, and I can only see 90 (or more i.e. 101)? Who/what flags such delta? Have I got awarded with 1 extra PC, or someone else is plugged on my network? | 5 | 4 | 1 | 10 |
| How to achieve better integration (and/or rationalisation) between national forces or between collation partners? i.e. Comparable systems (similar services) deployed more than once, one for each force. | 3 | 4 | | 7 |
| SLA: How to define an SLA and make sure it's measurable and has a defined link to service impact. | 4 | | 3 | 7 |
| How do I determine root causes of service/resource problems/incidents? | | 3 | 2 | 5 |
| Demand management. How to manage & translate the demand for communication, information services & business process automation into actual product offerings. | | 2 | | 2 |
| How to apply / make use of an enterprise architecture? | 2 | | | 2 |
| How do I define what performance information I need from my service provider? | | | 1 | 1 |
| What are responsibilities / level of control do / should I still have when I look to outsource a service? | 1 | | | 1 |
| How do I become (more) agile? How can I change/improve services in a timely manner? (Timely as when needed not as soon as possible.) | | | | |
| How do I incentivise/encourage service innovation (e.g. driven by technology improvement)? | | | | |
| Scalability. How to ensure that outsourced service(s) sufficiently allow for significant & dynamic growth or shrinkage in usage, reach…? | | | | |

  

| Issue: | 1st Responder | 2nd Responder | 3rd Responder | Total Mark |
|---|---|---|---|---|
| When implementing a centralised Management System, with an holistic approach, how to separate information details at different management levels. What best practices, recommendations and standards exist, e.g. TM Forum? | | | | |
| How to educate users on the availability, the potential and use of new services? | | | | |
| Benefit capture, benefits mapping, maturity management. How do you achieve / measure / make sure there is an improvement in the Enterprise (Defence) by improving my IT service. | | | | |

**Table 6-3 Dutch Defense Issue Ranking**

| Issue: | Normalized Mark |
|---|---|
| How to manage the total installed base of (end-to-end) services and resources. What does everything deployed/added look as a whole?<br>Example: How do I compare the as-is with the "should-be". I have been invoiced for 100 PCs, and I can only see 90 (or more i.e. 101)? Who/what flags such delta? Have I got awarded with 1 extra PC, or someone else is plugged on my network? | 3.43 |
| How to create an integrated overview of products, services & resources (networks. Network elements, IT systems, devices)? How to relate & map product offerings, services and comprising resources? How to capture this with service/resource catalogue & inventory management? | 2.57 |
| How to achieve better integration (and/or rationalisation) between national forces or between collation partners? i.e. Comparable systems (similar services) deployed more than once, one for each force. | 2.43 |
| How to apply / make use of an enterprise architecture? | 2.23 |
| How do I define what performance information I need from my service provider? | 2.20 |
| Demand management. How to manage & translate the demand for communication, information services & business process automation into actual product offerings. | 2.14 |
| How do I determine root causes of service/resource problems/incidents? | 1.86 |
| SLA: How to define an SLA and make sure it's measurable and has a defined link to service impact. | 1.86 |
| How do I become (more) agile? How can I change/improve services in a timely manner? (Timely as when needed not as soon as possible.) | 1.71 |

  

| | |
|---|---|
| What are responsibilities / level of control do / should I still have when I look to outsource a service? | 1.60 |
| Scalability. How to ensure that outsourced service(s) sufficiently allow for significant & dynamic growth or shrinkage in usage, reach…? | 1.50 |
| How do I incentivise/encourage service innovation (e.g. driven by technology improvement)? | 1.43 |
| When implementing a centralised Management System, with an holistic approach, how to separate information details at different management levels. What best practices, recommendations and standards exist, e.g. TM Forum? | 1.43 |
| Benefit capture, benefits mapping, maturity management. How do you achieve / measure / make sure there is an improvement in the Enterprise (Defence) by improving my IT service. | 1.14 |
| How to educate users on the availability, the potential and use of new services? | 1.00 |

**Table 6-4 Final Issue Ranking**

  

# 7. Bibliography

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TMF866, Federated Service Management for Defense (Catalyst) Blueprint, Version 1.2

# 8. Administrative Appendix

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

## *8.1. Document History*

This section records changes to versions of the document as well as the release history.

### Version History

| Version Number | Date Modified | Modified by: | Description of changes |
|---|---|---|---|
| 0.1 | 6th September 2012 | Nick Webb (TM Forum) | Wrote initial draft |
| 0.2 | 25th September | Tim Daeleman (TNO) | Revised introduction based on comments |
| 0.3 | 25th September | Nick Webb (TM Forum) | Revised following additional comments. Revision of survey results |
| 0.4 | 1st October | Tim Daeleman (TNO) | Revised following additional comments, addition of Sections 2 and 3 and re-write of Introduction |
| 0.5 | 2nd October | Nick Webb ( TM Forum) | Minor formatting and cosmetic corrections made prior to web posting for Member Evaluation |
| 0.6 | 14th October | Nick Webb (TM Forum) | Updates based upon community comments |
| 0.7 | 15 October 2012 | Mary Amalfitano | Updated based on Team Vote meeting on 15 October and format cleanup |
| 0.8 | 6 November 2012 | Alicja Kawecki | Minor style/cosmetic edits prior to posting and Member Evaluation |
| 0.9 | 25 February 2013 | Nick Webb (TM Forum) | Minor style/cosmetic corrections following Member Evaluation |
| 0.10 | 26 February 2013 | Alicja Kawecki | Updated Notice, footer and fixed section numbering prior to submission for AWG |

  

| | | | |
|---|---|---|---|
| | | | approval |

### Release History

| Release Number | Date Modified | Modified by: | Description of changes |
|---|---|---|---|
| x.y | DD-MMM-YYYY | Name<br>Company | Description |

## *8.2. Company Contact Details*

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## *8.3. Acknowledgment*

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# 9. Annex A – The other issues

## *9.1. Demand Management. How to manage & translate the demand for communication, information services & business process automation into actual product offerings.*

### Issue description

Within a federated Service environment encountered in many Defense Organizations, Services are rarely translated into easy to understand and order End to End Services, but are more often an amalgam of different Services offered by the different Networks and Services within the Federated environment. The issue facing Defense Organizations is how to translate to a system that provides more automated and simpler orderings.

### Related case study: Better Service Provisioning g and Activation Create Foundation for Growth[14]

The following is an extract from a case study about Magyar Telekom's solution to resolve similar issues:

*"Magyar Telekom (MT) is Hungary's largest telecom provider. It provides fixed and mobile telephony, data transmission, and IT and systems integration services to consumer and business customers. MT is also the majority stakeholder in Crnogorski Telekom in Montenegro and Maekdonski Telekom in Macedonia.*
*Launched in 2008, MT started by collaborating with HP Solution Consulting Services (SCS) to transform its business structure, processes, and technologies, and implemented a unified activation and provisioning framework for all services. MT's Service Provisioning Automation project (SPA) converted a home-grown legacy provisioning system to a single platform for provisioning and activation of multiple product lines. Operational Support Systems (OSSs) slated for conversion included service design and resource assignment, order entry, service activation, and upstream systems notification.*
*Completed in Q2 2009, the project realized a number of measurable benefits, including:*

- *Service activation time was decreased by 20 percent;*
- *The ratio of successful automated activations was improved by 30 percent;*
- *Time-to-market was decreased by 10 to 20 percent by implementing a Customer Relationship Management (CRM) system that is independent of product structure for the provisioning system, and clear service and resource-facing service definitions;*
- *Integration time and effort of new network management systems (NMS) was decreased by 30 percent;*

[14] http://www.tmforum.org/ResearchPublications/7097/home.html?q=Case_Studies#TRCPublications/Link46018

  

- *Manual configuration times – when needed – were decreased by 70 percent;*
- *Field force activities decreased by 30 percent due to zerotouch home gateway deployment.*

*TM Forum's Business Process Framework provided significant value in the design of this architecture; orchestration, decomposition. Other processes from the Business Process Framework described the primary handoffs between CRM, product lifecycle management, and SPA processes.*
*The interfaces at these handoffs were described using the TM Forum Information Framework (SID), which guided the architectural choice of separating product, service, and resource, which were extended to meet MT's particular needs. In addition, the Information Framework provided a starting point for the common data model used throughout the project: Business Process Framework processes and Information Framework objects were used for detailed process and interface designs.*
*There are also a number of personnel benefits arising from the use of TM Forum standards. The use of TM Forum Frameworx helped management convey the quality and professionalism of the solution design methodology and operational model. Clear definition of different application responsibilities helped to reduce frustrations that would otherwise be felt on such a substantial transformation project. Diagrams derived from Information Framework and Business Process Framework helped to communicate project plans with stakeholders.*
*The OSS team claims that creating the processes and data structures for this project from scratch would have taken much longer than re-using Frameworx.MT also attributes a number of benefits to the use of TM Forum standards, including a 25 percent reduction in definition and detail design, and an overall 10 percent reduction in development time. Substantial risks were also mitigated."*

## Use of TM Forum Frameworx

The TM Forum Business Process Framework and Information Framework provided the backbone to this project. This provides a common understanding of the architecture and issues involved. Without this common understanding to all those involved the project goals may not have been realized.

## Relevance to Defense

The Business Process Framework provide a common process architecture by which all the parties involved understand where they sit in the end-to-end process and their associated roles and responsibilities. Within a Federated Architecture it acutely important that all the parties involved in the delivery of the end-to-end Service understand their roles and responsibilities therein.

  

## *9.2. How do I determine root causes of service/resource problems/incidents?*

Within a Federated Service Environment the ability to identify the source of an incident is imperative so that incidents can be resolved quickly and efficiently rather than being bounced between different Service Providers. At the same time it is equally important to understand the impact of an incident on the delivery of the End to End Service. Within the Defense environment this can be critical, without knowing how an incident has impacted on Services restoration priorities cannot be set correctly which could have a directly impact on current operations.

### Related case study: Consistent processes deliver more than 50 percent greater efficiencies in launching new services[15]

*"MIMO Tech Co. Ltd. of Thailand is an IT service provider and content aggregator for value added services such as mobile, broadband and content. The provisioning of value-added services was becoming increasingly complex and more important to its business in terms of remaining competitive and retaining market share. In addition, the value-added services' architecture was not flexible enough to support dynamic marketing, technological changes and new business models. It turned to a unified service management tool, aligned with TM Forum's Frameworx suite of standards, to achieve its business transformation. This helped it reduce operating expenditure by 20 to 30 percent through greater efficiencies between service modeling and monitoring. It also continues to see at least a 50 percent improvement in efficiencies in offering new value-added services compared to the way it used to work.*

***Information sharing:** The solution has a number of tools to help different departments share information more quickly and easily. For example, IT network owners can build and test resource blueprints by modeling network node frameworks, each of which carries out a specific function for a service.*
*Once these and other tasks have been completed by the IT network, the service planners can use the information generated for a variety of purposes, from building on these network resources to plan and design services at a high level, to coming up with service blueprints such as service sequence diagrams, service topologies, impact diagrams and network path schematics, and of course testing.*
*These consistent processes between the two disciplines mean that all the value-added service blueprints can be stored in a unified data model that is used in a production environment for unified service monitoring. This provides a 'living' centralized repository of information for service configuration and service dependencies.*

[15] http://www.tmforum.org/CaseStudies/Consistentprocesses/47940/article.html

  

*When resource and/or service alarms are received, they are correlated according to the service impact and dependency models.*

***Customer support:*** *When one of the customers reports a service problem, the support team can look at a dashboard to identify the service and the alarms associated with it. They can investigate to find the root cause, log customers' complaints and create a trouble ticket. The company's engineers use the diagrams created by the service planners to help fix the problem, which clears the alarms and trouble ticket more quickly than was previously possible.*
*So from SIP to Operations, information is shared among departments in a unified way, from the IT and planning groups to the operations, support and management teams, saving time and effort, and increasing customer satisfaction. Service impact presentation and analysis is available across the teams without being limited 'by group, by service type, by inbound/outbound flow and so on'.*

***The business benefits:*** *MIMO has transformed its SIP and Operations management functions, and enjoyed very substantial benefits from that transformation and continues to see at least a 50 percent improvement in efficiencies in offering new value-added services compared to the way it used to offer them. The efficiencies are largely due to the end-to-end service flow, the service path, and the service impact to service monitoring process, from SIP to Operations, as defined by TM Forum's Business Process Framework."*

### Use of TM Forum Frameworx

Understanding the relationship between the Resources and associated Services delivered over those resources is key to understanding how resource problems and failures impact the Services and Customers using those Services. MIMO used the TM Forum Standards to develop a unified Service Management tool which links the resources to the Services that are being delivered. This used the Business Process Framework to ensure process consistency and the Information Framework to produce the associated models.

### Relevance to Defense

Once again it has been shown that the Information and Business Process Frameworks are key to defining and identifying the key processes, process relationships and ensuring process consistency. The Information Framework defines a relationship between Services and resources which can be adapted and built upon to support a particular organization's needs.

## *9.3. How do I become (more) agile? How can I change/improve services in a timely manner?*

Within the Commercial environment it is clear that the rate of Service evolution is increasing. As new Services are made available to Consumers, Service Providers must be ready to deliver them quickly and efficiently without disrupting existing Services or, at the same time as the

  

Service introduction, improve existing Services without affecting the consumers' ability to use them.

## Related case study: Simpler IT speeds up new service provision, drives take-up[16]

*"Mobitel, Slovenia's biggest wireless communications service provider, operates in challenging conditions. It is facing increasing competition, is heavily regulated and must comply with complex governmental processes before it can provide customers with new products and services. In addition, Mobitel's OSS/BSS applications were developed in silos and it relied heavily on manual processes. Nevertheless, it has transformed itself, now delivering unique and customized products and services to the market, and will do so even more as it merges with its parent company, the incumbent fixed communications services provider, Telekom Slovenije (see page 26). For example, it will begin to offer combined fixed and mobile bundles starting July 2011. Little wonder Mobitel decided to adopt a service oriented architecture along with TM Forum's Frameworx and streamline its IT and application infrastructure.*
*It worked closely with IBM to gain greater operational flexibility, business agility, and the ability to respond to customers more rapidly. Mobitel reaped benefits almost immediately.*
***Selection process:** Mobitel's primary reason for adopting a BPM and SOA approach was to separate business processes from the business applications so that business agility could be improved. TM Forum's Frameworx was adopted as the basis to provide a standards-based implementation model based on SOA and telecom industry standards, enabling Mobitel to reduce the risk of a vendor-specific implementation model.*
*Mobitel then prioritized the business processes that needed to be transformed, focusing on those that were most important to meeting its core business objectives. SOA maps IT services to business goals to help rationalize and optimize business processes by identifying and minimizing redundant or inefficient tasks. It also reduces operating costs, which in tough economic times is very important. With the promise of business optimization and the cost reductions it brings, Robežnik obtained buy-in from Mobitel's business units. One of the first aspects of its business that Mobitel chose to transform was order management, specifically customer order handling. Right from the start, Mobitel was committed to using TM Forum's Frameworx in its IT transformation program and chose IBM as a partner to convert its existing infrastructure using its Smart SOA approach.*
***Tangible benefits:** The IBM WTCP provides prebuilt process models, business services, messaging schemas and other content based on TM Forum's Frameworx, and supports the WebSphere Dynamic BPM platform. By adopting this Frameworx-based approach, Mobitel has enjoyed the following benefits:*

- *40 percent less expenditure on professional services;*

[16] http://www.tmforum.org/casestudies/SimplerITspeedsup/46021/article.html

  

- *80 percent saved through the reuse of artifacts;*
- *45 percent shorter delivery cycle for the ongoing maintenance and new releases of processes;*
- *40 percent reduced total cost of ownership.*

*Mobitel began work on the customer order management function after a business value assessment was completed in collaboration with a team of business and technical experts from IBM. Klemen Dragar, IBM client executive, says, "We created this assessment with staff from Mobitel working alongside our telecom industry experts to draw up a transformation roadmap. We needed to understand what Mobitel wanted to accomplish as a business and how quickly they needed to achieve their goals.*
*"We helped them assess the costs and lead times required for process transformation using their existing systems and compared that cost to using a SOA approach using IBM's Dynamic BPM capabilities and our accelerators for implementing Frameworx process models, data models, application maps and a technology neutral architecture. It was clear SOA would create big financial benefits and we would be able to measure the benefits to Mobitel."*

In the same vein, Service Providers themselves must be able to adapt to changes in their environment so Services are maintained and costs kept down[17].

*"This case study is about the Frameworx [NGOSS]-based solution implemented at a US federal government organization (hereafter referred to as "the Organization"). The Organization provides telecommunications and network services to many organizations within the government. In other words it plays the role of an internal Telco and provides services on a par with other Tier 1 commercial providers. As part of an organization-wide technology refresh, the Organization chose to update their OSS suite and implement a SOA-based architecture. The result was an enterprise-wide business transformation. This transformation was expressly based on TM Forum and Frameworx [NGOSS] principles.*
*The Organization's mission requires it to provide secure communications, rapidly deployed to meet the needs of governmental organizations around the country. Lengthy fulfillment times, a lack of in-fight order visibility, and the introduction of new services sparked a re-evaluation of the Organization's back office.*
*In the framework of the legacy fulfillment, inventory, and assurance systems update, the Organization's OSS architects were tasked to support the following top-level business values:*

- *Build a Service Oriented Integration environment where data interfaces are published, self describing, and reusable*
- *Use common, shared information exchange schema for application integration*
- *Support dynamic, on-demand provisioning and activation of voice, video, and data services*

[17] http://www.tmforum.org/casestudies/ApplicationofFrameworx/41973/article.html

  

- *Provide end-to-end visualization of the network*
- *Reduce order to fulfillment cycle time*
- *Provide better order tracking transparency and reporting*
- *Automate processes and facilitate ongoing process re-engineering*
- *Create interoperable and interchangeable OSS components using one data interface per application*
- *Provide integrated, real-time situational awareness of the network*

*Industry-standard specifications bundled with COTS solutions reduced delivery times, enabled fast service introduction, and consequent integration cost reductions.*
*To date, the Organization has reduced the system count in the fulfillment chain. Now a unified Resource Layer holds all as-built and to-be inventory data. In addition, this also eliminates several GOTS systems, which was also a key goal. This has driven down costs and updated the underlying technology. The Organization has also received the capability to report on exact order statuses. Future plans include self-service portals where secured users can get instant status and order tracking information."*

## Use of TM Forum Frameworx

Both IBM and Netcracker use Frameworx to implement a Service Oriented Architecture which provides a highly agile and adapted platform for the Operations Support Systems and Business Support Systems that organizations need to manage their Service Delivery, resource configuration etc.

## Relevance to Defense

Using Frameworx provides a standard based implementation model which reduces the cost associated with System and Service integration. This is because Frameworx provides a set of open, non proprietary telecommunications industry wide specifications. As vendors' products are certified as meeting Frameworx conformance, organizations can be assured that they are not locked into a single vendor's solution suite when implementing OSS and BSS software.

## Related case study: Getting services to market 46 percent faster while seeing almost immediate return on investment[18]

*"Türk Telekom recognizes that its business needs to evolve to stay at the top. In particular, it wants to become more customer-centric and to be able to get offers to market faster, by shifting to a more business-centered model for IT infrastructures, moving away from functions and applications to processes and business. With this mind, it moved to a service oriented architecture, which enables far greater reuse of processes and services, through a multi-phase*

[18] http://www.tmforum.org/ResearchPublications/7097/home.html?q=Case_Studies#TRCPublications/Link47942

  

*program that will be carried out over several years. The transformation program is built around the best practices and principles of TM Forum's Frameworx. At the end of the first phase in 2010, the implementation team delivered services, on average, 15 percent faster than before, despite the need for much more testing. Already the second phase is using more than 60 percent of the services from the first stage. Time to market for new offerings was reduced by 15 percent in the first phase which has increased to 46 percent in the second, with 42 percent return on investment from the second phase.*

***Advantages of service oriented architecture:*** *Türk Telekom opted for an SOA approach because implementing SOA-based solutions is less costly, as the integration of clients and services doesn't need the in-depth analysis and the unique coding of customized solutions. Other benefits of an SOA approach include:*

- *Reusability: an application's business functionality can be reused to meet new business requirements. New services can be designed with reusability in mind, determined by their usage patterns within the business domain.*
- *Interoperability: communication between services and the business processes is not dependent on the platform and are standards-enabled. Also, the services are not tightly coupled to the application.*
- *Scalability: applications are flexible to meet changing business requirements.*
- *Cost: Highly cost efficient as integrating the business resources is standards-based.*

***In conclusion:*** *Long term, strategic ROI is harder to difficult to quantify because the savings and increased revenue are based on agility afforded through service infrastructure and business alignment. This index will be influenced mainly by the following goals being achieved through the TTIP infrastructure:*

- *better alignment between business needs and IT resources on different platforms;*
- *the simplification of business reporting and management using business monitoring tools that provide near real-time business reports and alerts on critical conditions;*
- *The elimination of barriers between different platforms or applications enabling the simple creation of processes that use services on different platforms;*
- *reducing the risk of vendor lock-in through SOA standards instead of proprietary protocols;*
- *being able to modify information systems with little or no coding.*

*Taking these aspects into consideration, ROI could reach 130 percent within three years."*

## *9.4. When implementing a centralized Management System, with an holistic approach, how to separate information details at different*

  

***management levels. What best practices, recommendations and standards exist, e.g. TM Forum?***

This can be seen as one of the core benefits of using Frameworx, within a Defense Federated Service Environment the different management layers, information domains, etc., are more complex and may be repeated several times within the vertical delivery stack; for example the decomposition of an End to End Service order into the constituent Service order parts which are then sent to the appropriate Service and Network Providers, who may then place their own order with a Third Party to provide part of the Service under a SLA. The same basic information id used at each Management Level, but as it moves down the order stack increasingly detailed information is added to the order so the Third Party knows that they are required to deliver a Service between point A and point B which meets the performance requirements of the End to End Service.
While there are no Case Studies that illustrated this abstraction of information across different Management Levels, Netcracker's solution for a US federal government organization illustrates how the different management layers interoperate:

## Related case study: Application of Frameworx for COTS-Based Business Transformation[19]

*"This case study is about the Frameworx [NGOSS]-based solution implemented at a US federal government organization (hereafter referred to as "the Organization"). The Organization provides telecommunications and network services to many organizations within the government. In other words it plays the role of an internal Telco and provides services on a par with other Tier 1 commercial providers. As part of an organization-wide technology refresh, the Organization chose to update their OSS suite and implement a SOA-based architecture. The result was an enterprise-wide business transformation. This transformation was expressly based on TM Forum and Frameworx [NGOSS] principles.*
*The Organization's mission requires it to provide secure communications, rapidly deployed to meet the needs of governmental organizations around the country. Lengthy fulfillment times, a lack of in-flight order visibility, and the introduction of new services sparked a re-evaluation of the Organization's back office.*
*The legacy architecture was a collection of systems specifically built for the Organization's use, the legacy CRM portal being a customized GOTS (Government Off The Shelf) system. The service fulfillment process thus caused inconvenience and was endangered by slow service delivery times, high risks of data inconsistency, and human factor interferences.*
*The legacy inventory system was a collection of COTS and GOTS products used for network documentation. It had basic workflow capabilities, but lacked automated fulfillment.*

[19] http://www.tmforum.org/casestudies/ApplicationofFrameworx/41973/article.html

  

***The Customer Relationship Management Layer:*** *The Order Entry Portal replaced the legacy application with an SOA-capable back end (NetCracker Order Management module), while product definitions are held in a product catalog. OSS/J order definitions are carried over web services to the Order Management system.*
***The Service Management and Operations Layer:*** *The Order Management System (NetCracker Service Inventory and Service Provisioning & Activation modules) receives orders from the Order Entry Portal. Manual decomposition is replaced with advanced workflow which carries the order through to fulfillment. Service order definitions may be reused to aid the rollout of new services or changes to existing ones.*
*Workflow notifies network engineers to plan and design the needed resource allocations. All designs are made in the Network Inventory System.*
***The Resource Management and Operations Layer:*** *The Network Inventory System uses NetCracker Resource Inventory, Design & Planning, and Discovery & Reconciliation modules. Network discovery occurs across the CCV to EMSs. The CCV publishes web services with MTOSI definitions for device and circuit inventory. All inventory and capacity is automatically tracked.*
***Assurance:*** *The Service Quality System exposes the service portfolio for a given customer on the Service Portal. The Service Portal is outside the secured OSS enclave. Data is pushed to a replication instance where JSR-268 port lets feed the service portal inventory, status, and order data.*

*Industry-standard specifications bundled with COTS solutions reduced delivery times, enabled fast service introduction, and consequent integration cost reductions.*
*To date, the Organization has reduced the system count in the fulfillment chain. Now a unified Resource Layer holds all as-built and to-be inventory data. In addition, this also eliminates several GOTS systems, which was also a key goal. This has driven down costs and updated the underlying technology. The Organization has also received the capability to report on exact order statuses. Future plans include self-service portals where secured users can get instant status and order tracking information."*

## Use of TM Forum Frameworx

NetCracker used the Business Process Framework to support the definition and development of the different management layers that formed the solution. By using the Business Process Framework to develop the associated process flows, the Information Framework could then be used to identify the data exchanges between the processes and, correspondingly, between the management layers.

## Relevance to Defense

As before Frameworx has been used to provide the process and information architecture, and also used in developing the process flows and process data exchanges required in implementing

  

the solution. Frameworx provides a common language by which all those involved in the developing as well as the building blocks from which the solution can be developed.

  

### *9.5. SLA: How to define an SLA and make sure it's measurable and has a defined link to service impact.*

When using a Third Party to provide part of the Service being delivered to a consumer it is vital that some sort of agreement is in place to ensure that the Service is, at the very least, delivered between the right start and end points. More complex SLAs will specify performance requirements of the Service, what is expected from each party involved in the SLA, what information is to be provided between parties so that the Service can be managed, what happens when things go wrong etc. It should be noted that a SLA is an agreement between two parties and not a method by which one party can seek redress for the other party if things go wrong (any contract related to the SLA should cover penalties etc.).
As with the previous issue 'How do I define what performance information I need from my service provider?', there are no Use Cases that provide examples of defining a SLA to deal with this issue, though previous examples have looked at linking incidents to Service Impact. Pakistan Telecom used Frameworx in their consolidation program and found invaluable in helping them better define performance metrics:

## Related case study: Enabling consolidation and growth to go hand in hand[20]

*"Pakistan Telecommunication Company Limited is the country's largest communications service provider, offering voice, data, Internet, and TV services. It chose to use TM Forum Frameworx to help it consolidate its network operations when facing a period of rapid growth in its drive to improve the reliability of the network and its customers' experience. As a result it suffers 50 percent fewer network alarms, has 30 percent fewer outages across multiple networks and the time to fix cut fiber cables has fallen by 40 percent. It has also enjoyed a 5 percent drop in indirect costs thanks to better visibility across its infrastructure.*

*In 2008, PTCL chose to work with a number of vendors and TM Forum to create a new Network Operations Center (NOC) because it knew it was about to experience rapid growth and needed to be more streamlined and agile operationally. As it turned out, PTCL tripled its broadband subscriber numbers and doubled its broadband coverage in 2009. The NOC consolidates what were previously several dozen separate element management system functions, which didn't provide a centralized view of the company's network.*

*A central NOC is now located in Islamabad, with regional NOCs in Lahore, Rawalpindi, and Karachi. Together, they control, monitor, and manage the PTCL network through a centralized platform. The project's benefits include:*

[20] http://www.tmforum.org/ArticlePTCLUfone/9289/home.html

  

- *40 percent reduction in time to restore cut fiber optic cables, with associated operating expense benefits;*
- *30 percent fewer wireless local loop, broadband, and MPLS outages, due to the faster resolution of fiber cuts;*
- *an estimated 5 percent indirect reduction in capital expenditure in the transmission/digital cross-connect domain due to improved visibility of network resources and their utilization;*
- *50 percent fewer network alarms, increasing service availability.*

*In addition, the NOC provides full visibility into cross-domain performance, traffic, and trends. This supports network planning for expansion and optimization, along with improved visibility into operational data for networks and operations, supporting better decision making.*

***Frameworx aids transformation:*** *Frameworx played a central role in the project. TM Forum processes allowed the company to create process abstractions such that both national and regional NOCs are treated as one virtual entity: the same processes apply regardless of technology, location, domain, or vendor.*
*In addition, PTCL says Frameworx supported lower costs throughout the project, based on the deployment of automated instead of manual procedures, standard process definitions, reusable processes, and the use of commercial off the shelf software. Automation efficiencies derived, in particular, from automated problem detection, trouble management, and the automated escalation of issues.*
*Specific Frameworx benefits were right across the board.*
*The Application Framework (TAM) enabled PTCL to identify applications and to assess vendors' capabilities, thereby helping the service provider draw up a technology roadmap.*
*The Business Process Framework (eTOM which is mapped to the Infrastructure Technology Information Library – ITIL) helped optimize fault management and performance management processes. It also provided more meaningful KPI metric data for the implementation of service quality management to drive a customer centric operational model. In particular, it provided the processes needed for:*

- *weekly and monthly performance and health checks;*
- *network monitoring;*
- *issue detection and resolution;*
- *alarm management;*
- *performance management;*
- *trouble ticketing;*
- *work order management;*
- *outage management."*

## Use of TM Forum Frameworx

The use of Frameworx was key to this project, as without it the necessary abstracted process flows developed between national and region NOQs. The Application Framework, along with an

  

abstracted process flow, allowed PTCL to identify the applications that would fulfill that process flow and assess vendor capabilities.

### Relevance to Defense

Frameworx was used to provide standard, reusable process definitions, that supported the development of abstracted process flows which enables national and regional NOQs to be treated as one virtual entity. In the development and realization of a holistic Service Management solution with a Federated Service organization the ability to treat all the federated Service Providers as one virtual entity can greatly simplify the understanding and implementation of said solution.

## *9.6. Benefit capture, benefits mapping, maturity management. How do you achieve / measure / make sure there is an improvement in the Enterprise (Defense) by improving my IT service.*

While the Frameworx lifecycle sets out need and application of a Continuous Improvement Process, to date no Maturity Model which exists for Frameworx (though the Revenue Assurance Maturity Model has been developed and used successfully by member organizations) which would support Continuous Improvement. The Revenue Assurance Maturity Model illustrates how process improvement can be measured and applied to a specific part of an Organization:

### Related case study: Better billing saves more than $60 million in a year and reduces churn[21]

*"In the space of three years, Verizon Retail implemented a comprehensive, customer-centric, margin-driven revenue assurance program for retail customers, based on the principle of prevention. Originally the program was to run over five years, but demonstrated such striking success so quickly, with each project paying for itself based on initial findings before full implementation, that the timeframe was shortened to three. The company says the size, scope and focus of this program is unprecedented for a Tier 1 service provider and that the three-year timeframe would have been "extremely challenging" without using TM Forum's standards, key performance indicators and Revenue Assurance Maturity Model. In 2010, the organization saved $20 million by preventing billing-related calls to its call centers and stopped 77 percent of combined over and under-billing issues from impacting customers, thereby netting a further $40 million. Progress continues apace, with Verizon working closely with TM Forum to refine and evolve the Model and other standards.*

[21] http://www.tmforum.org/ResearchPublications/7097/home.html?q=Case_Studies#TRCPublications/Link47938

  

***Ordering failures the main problem:*** *Most of the time, order failures are responsible for incorrect billing, but the established billing quality, accuracy and timeliness measures assumed that all ordering information was correct at the time of billing. This was not the case, but the billing team didn't have any control over ordering, and the metrics didn't take into account that the customer saw the bill as wrong, even if billing had done everything right. Verizon needed a program that optimized revenue and reduced errors to improve margins as well as revenue.*
*The original program called for a five-year implementation period, with 35 unique end-to-end processes defined for controls implementation, with each handled as an individual project. TM Forum standards, key performance indicators (KPIs) and our Revenue Assurance Maturity Model (see panel on page 58) were used as references to ensure that the implementation team was touching the right systems, gathering the relevant data and measuring itself appropriately.*

***How standards helped:*** *The Business Process Framework (eTOM) was used to look at the business functions impacting billing across the business lifecycle to make sure that all critical functions were catered for within the Revenue Assurance Program. Critically, by using the Business Process Framework, the team realized it needed to start with the planning side of the business, especially where it concerned new products or offers. As a result, the team has a seat at the table while new products and offers are being developed and can influence how new projects are delivered.*
*The Business Process Framework was also used as a guide to ensure that all business processes that affect the transaction, order or usage to bill processes were included in the controls built within the three-year program.*
*The Information Framework (SID) was used to drill down from the Business Process Framework to make sure that the team captured all the appropriate data elements from relevant systems. The Verizon Retail Revenue Assurance system receives more than 3,000 unique data feeds each month from more than 150 different systems, and involves more than 14,000 data elements for use in downstream audit processes.*
*The Application Framework (TAM) was used as a reference to identify all the relevant systems and the feeds acquired from them.*

  

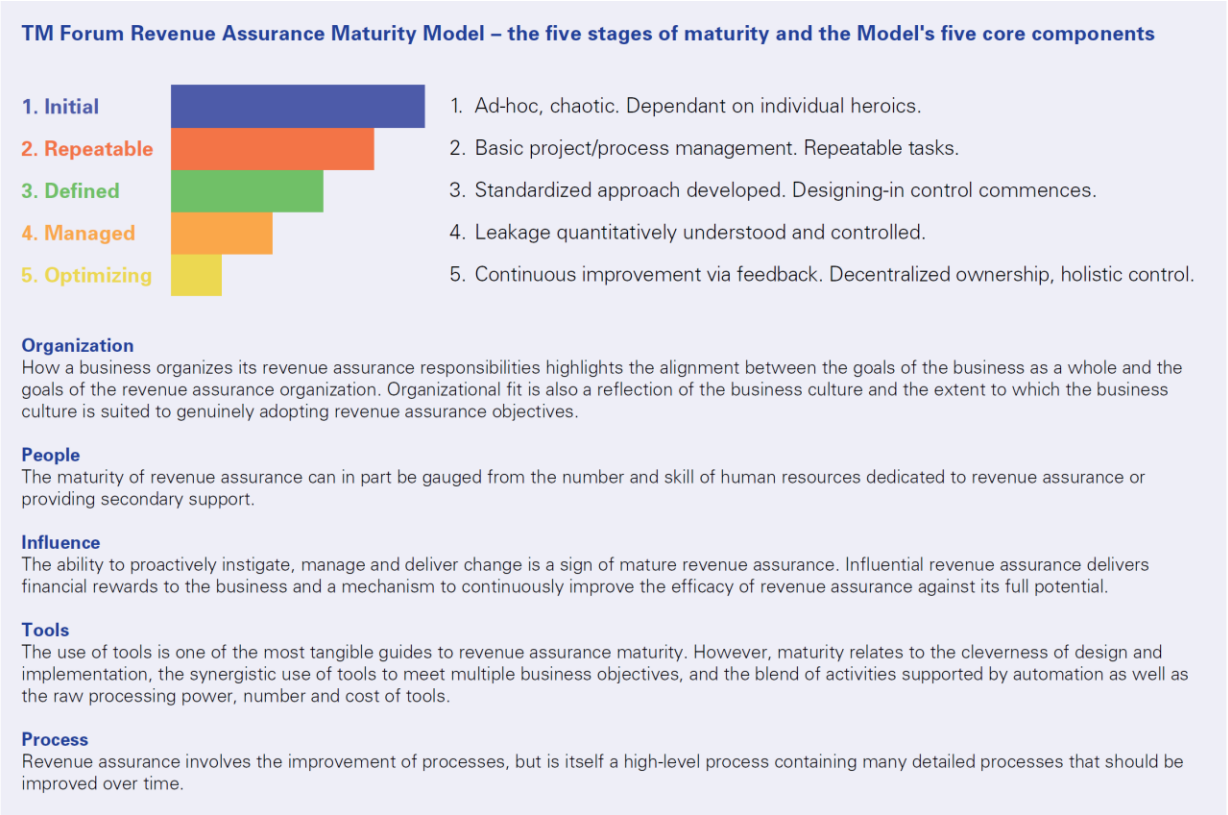


**Figure 3: TM Forum Revenue Assurance Maturity Model**

***Visible success, fast:*** *The success was so apparent that the team was asked to accelerate the program and complete its work in three years. "It would have been extremely challenging to shorten the Verizon Revenue Assurance program from five years to three without using TM Forum's standards, KPIs and Revenue Maturity Model," says Kathleen Romano, Executive Director, Revenue Assurance and Billing, Mass Markets, Verizon Telecom & Business, who led the team.*

*It chose Subex's Moneta system to build the controls, which allowed the operator to normalize data elements across the many systems impacted by the projects.*

*The results for the early projects were extremely promising, with each paying for itself based on initial findings before the project was fully implemented. Also Verizon was discovering billing errors while they were very small, before a significant number of customers was impacted. In one instance, the team knew about four issues and was using a workaround to correct them until IT could fix them.*

*Once controls were in place across the whole customer base, the team found more than 40 issues, most of them very small, and some hadn't yet impacted a bill, but would if the customer placed another order.*

*Findings from initial projects made the team realize that if key data wasn't aligned across certain systems, orders would fail and cause issues for customers, so it added several projects to measure data alignment."*

  

## Use of TM Forum Frameworx

The Business Process Framework was used to look at the business functions impacting billing across the business lifecycle. This ensured that all critical functions were identified. A benefit of this approach was that the team realized that the planning side of the business, critically the around the new products or offers needed to be tackled first. The Business Process Framework also provided a reference model by which a check that all the processes that affected the transaction were included in the program. The Information Framework was used to ensure that all appropriate data was captured for the associated systems. While the Application Framework was used to as a reference to identify all the relevant systems associated with the transaction.

## Relevance to Defense

Frameworx was used a reference model to ensure that all areas within the project were covered fully. This use of a Frameworx as a reference model allows organizations to optimize their processes using best practice. The alignment of the Business Process Framework with ITIL means that ITIL does not need to be discarded when using Frameworx. This is advantageous to organizations which have implemented ITIL to some extent.

  