IMS Operations Savings and Time to Market Improvements

The success of an IMS infrastructure will depend on the service provider's ability to quickly and cost-effectively introduce and manage new revenue-generating applications.

IMS-based solutions have shown operations cost savings of approximately 20-25%.

This white paper:

- Reveals the results of an analysis conducted to quantify operational cost savings and improved "time to market (TTM)" realized by using an IMS infrastructure
- Details a task-based operations cost model developed for comparing IMS-based solutions with point solutions

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Contents

Introduction

Service providers are often forced to deploy stand-alone, individual service applications (referred to as "point solutions") to meet revenue pressures; and are faced with the complex and expensive task of integrating these solutions and associated operations after investing in the infrastructure. The IP Multimedia Subsystem (IMS) architecture is designed to provide an environment where applications can share common functions and interact seamlessly.

The measure of success of an IMS infrastructure will depend on the service provider's ability to quickly and cost-effectively introduce and manage new revenue-generating applications. This paper describes the results of an analysis conducted to quantify and determine how applications/services deployed using an IMS infrastructure can reduce operations costs and improve time to market (TTM).

A detailed task-based operations cost model was developed for comparing IMS-based solutions with point solutions (PS) for a rollout of eight applications over three years. The model used the following to identify and quantify the tasks associated with deployment and management of new applications:

- Enhanced Telecom Operations Map™ standard
- Operations Cost Analysis & Modeling methodology (developed by Bell Labs)
- Total Operations Competence metrics (developed by Bell Labs)

The IMS-based solution results were compared with a point solution approach, and were used to identify where the differences lay and quantify them.

IMS-based solutions showed operations cost savings of approximately 20-25% overall, and a reduction of approximately 20% for time to market over the five-year study period.

Methodology and Assumptions

The analysis involved a five-step approach.

- Step 1: Identify applications and rollout plan
- Step 2: Estimate demand
- Step 3: Develop architecture models for IMS and point solution and size the network
- Step 4: Use the eTOM™ model to identify processes for deployment and management of new applications
  - – Detailed process flows with individual tasks
  - – Estimate time required to execute each task
  - – Weight with a cost factor (loaded salary per unit time)
  - – Determine elapsed time to calculate TTM
- Step 5: Compare IMS results with point solution. Identify where the differences lay and quantify them.

Each of these steps is described in more detail in the following sections.

Assumptions

For this study, we assumed a moderately-sized carrier that plans to introduce eight new consumer applications over a three-year period. We extended the study period to five years in order to observe the ongoing operational costs in the "steady state" where no new applications are introduced (years 4 and 5).

We compared two different scenarios:

1. The carrier has a softswitch-based network, and uses separate point solutions to deploy the new applications. Point solutions are defined as stand-alone solutions deployed on centralized application servers. Each point solution has to include all of the functionality required for the application it provides, e.g. presence servers, customer databases, etc.
2. The carrier has an IMS-based network, and uses IMS application servers and IMS application enablers (presence, location, HSS, etc.) to deploy the new applications. In this case, more functionality resides on shared platforms. In addition, the IMS-based network has a data server with a USDS (Unified Subscriber Data Server) type architecture that provides each application with a unified view of all subscriber-related data as needed. That is, the IMS-based network has a unified database platform.

We assumed that the carrier's operations and business processes follow the eTOM™ model.

Applications and Demand Model

We selected eight high volume, high demand applications based on secondary market research. Another criteria for application selection was to exercise several different types of network elements and access methods. In the model, these eight applications were introduced over a three-year period, as shown in Table 1. The target take rates for different categories of customers in the year 2010 was calculated using secondary market research. We assumed an S-shaped adoption curve to calculate the year-by-year forecast. The take rates were applied against a hypothetical customer base of approximately four million subscribers. In the resulting forecast, each subscriber used an average of 2.5 applications.

Application	Deployment Year	Access Type	Description
Wireline VoIP	1	Wireline	Voice with CLASS features
Push Messaging	1	Wireless	User gets notification of voice mail headers and streamed message content
WiFi Roaming	2	Converged	Dual mode phone using WiFi within home
Instant Messaging	2	Wireless	Similar to on-line service
Presence-Enabled Phonebook	2	Converged	See status of contacts
Push Content	3	Wireless	User gets notification of subscribed info based on location
Locator	3	Wireless	User can see location of contacts
On-line Call Management	3	Converged	User can manage detailed call treatment

Table 1. Application Deployment by Year

Network Models

Two different network models were compared as described in the assumptions: a softswitch point solution architecture, and an IMS-based network architecture. They differ in the call control architecture, as well as at the application layer. Each point solution has to include all of the functionality required for the application it provides, e.g. presence servers, customer databases, etc. In the IMS-based solution, SIP or OSA application servers and IMS application enablers (presence, location, HSS, etc.) are used to deploy the new applications. In this case, more functionality resides on shared platforms. In addition, the unified database platform was included in the IMS-based solution.

Based on the subscriber base and the forecast for adoption of the new applications, the networks were sized in terms of the number of each type of server that would be required. This was important for calculating network operations costs.

Operations Models

Operations cost analyses have a long tradition in telecommunication services companies. Typically, an analysis is conducted to determine the key cost components of various operations processes that are performed on a regular basis, either manually or assisted by operations support systems (OSSs). Operations cost is known to be a significant part of the total cost of network ownership. As the telecommunication industry embarks on deploying IMS technology as the platform of choice for the next-generation networks, the potential operations cost savings of IMS network versus current packet and traditional time division multiplexing (TDM) networks have become a subject of considerable interest.

Operations Cost Analysis Modeling (OCAM) is a systematic approach in determining operations cost impact in a service provider environment. OCAM was developed in reference to the levels and business processes that are defined in the enhanced Telecom Operations Map (eTOM™) standard. A detail task-based model that covers relevant eTOM™ level three processes and includes up to two additional levels of detailed processes was developed. In addition, a number of input variables such as subscriber volumes, take/growth rate, churn rate, network sizing, frequency of user actions (such as billing inquiries) and trouble reports, application data, % applications available to both wireless and wireline users, and so forth are used to determine the operations costs.

The parameter values used in the OCAM are from various resources such as known benchmarks, analysts reports, FCC reporting, Bell Labs Total Operations Competency (TOC) metrics, and educated estimates, taking into account different conditions and uncertainties. Based on our understanding that not all Service Providers operate alike, the OCAM model is highly parameterized to support the uniqueness of each Service Providers operations environment.

The model is not limited to the selected applications. To add a new application, all that is required is to enter the necessary application specific data into the model. The order of application deployment can also be varied.

For the most part the model assumes a generic set of IMS components. However, we have modeled the capability of the unified database platform in order to understand its impact on operations. The model could also be modified to look at specific architectures and groupings of functions as requested by a service provider.

The model analyzes the ongoing operations effort and does not include the cost of migrating or enhancing legacy OSS/BSS systems and data to support the IMS or the point solution environments.

Results and Analysis

Operations Cost Savings

Figure 1 illustrates which operations areas in the OCAM were derived from the eTOM™ model. For example, Customer Management is a high-level operations area in the OCAM; and is equivalent to the Customer Requirement Management (across Operations Support & Readiness, Fulfillment, Assurance, and Billing) in the eTOM™ model. There are four high-level operations categories in the OCAM:

- Network/Services/Applications Build-out
- Customer Management
- Network/Services/Applications Management
- Staff Resource Requirements.

Each high-level OCAM operations category is decomposed into further detailed tasks (at 2~3 levels downward). In total, there are more than 80 detailed tasks with specific cost information.

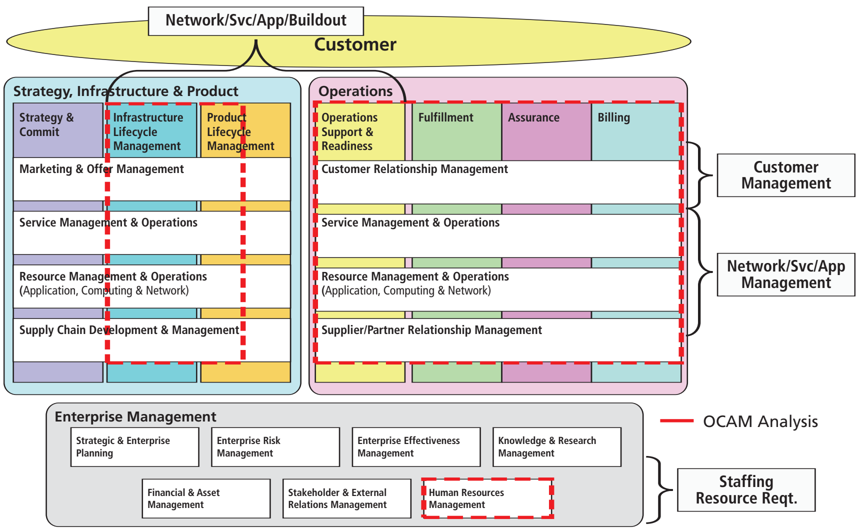

Figure 1. eTOM™ Model (Level 2) and OCAM Operations Categories

With a detail analysis and comparison of effort for each task for the generated operations load over the five-year study period, we observe that:

- IMS shows a 20-25% savings after year 2006 (as shown in Figure 2)
- The largest absolute operations cost savings comes from Customer Management (as shown in at chart at the lower right corner of Figure 2)
- Relative operations cost savings can be seen across all areas of operations (as shown in Figure 2 as well as in Table 2)
- Approximately half of the 20-25% savings is contributed by the unified database platform. That is, the savings will range 10-13% without the unified database platform.

Figure 2 illustrates that IMS will results in operations cost savings starting from the very first year (2006). The savings grow from 13% in the first year to approximately 20-25% for the next four years. Cost savings can be seen across all four operations categories namely, Staffing Resource Requirement, Network/Services/Applications Management, Customer Management, and Network/Services/Applications Buildout. The bulk of the cost savings, however, come from the Customer Management operations category. Figure 2 shows that, in year 2008, IMS has 21% in operations cost savings. The Customer Management operations category contributes almost 70% of the total savings, two-thirds of which is in customer trouble management, and the rest primarily in Customer Provisioning. Some primary reasons for cost savings in this category include:

- PS may require separate trouble tickets and separate subscriber information entry for each application
- PS requires the attendant to repeat problem determination and isolation tasks for each application; while IMS shared infrastructure provides information on multiple applications reducing/eliminating task repetition
- PS may have different procedures to repair each application; while IMS's common/shared platforms will result in common procedures resulting in simplification and reduced number of tasks
- PS may requires the attendant to search for subscriber information in each application; and IMS, with its unified subscriber data server, performs one search for multiple applications;

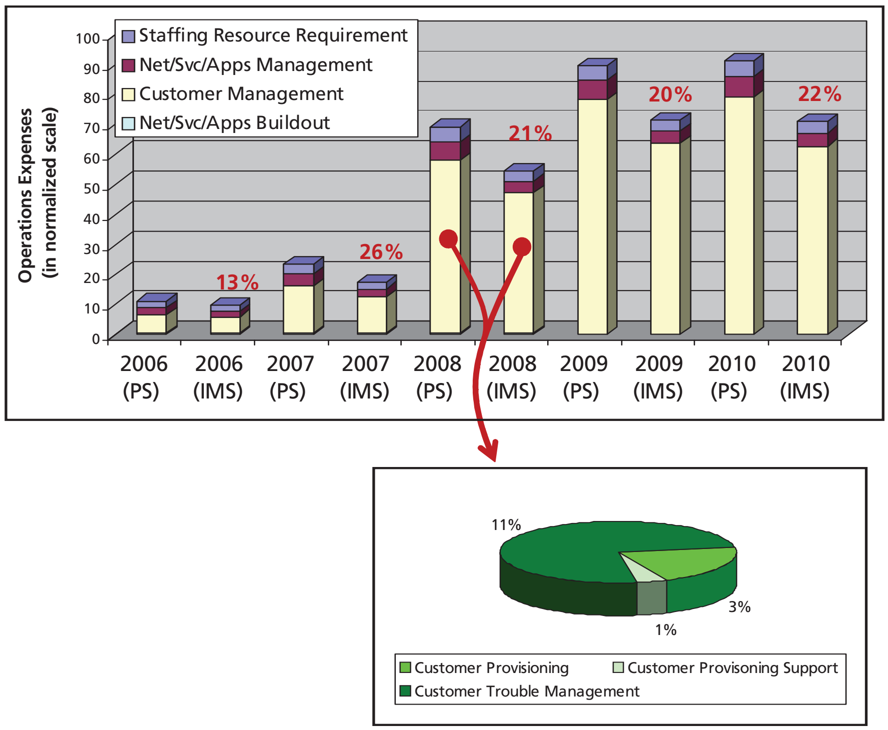

Figure 2. Profile of IMS Operations Cost Savings

IMS infrastructure areas that result in operations advantages are depicted in Table 2.

Advantage Area	Operations Impact
Shared Platforms	• Fewer network elements (to support multiple apps) • Reduced build out time • Reduction in training (incremental) • Incremental HW/SW/FW configuration/updates
Consistent Framework	• Quicker to track down network troubles and easier to isolate • Easier to provide consolidated network views • Easier to define architecture, requirements, processes & interfaces
Open Standard Interfaces	• Less integration complexity • Reduction in training (incremental)
Consolidated User Service Data	• Provides consolidated user service data across multiple applications • Easier to debug troubles/handle inquiries related to user specific service • Reduced complexity for Subscriber provisioning
Unified Data Schema	• Reduced time for troubles handling management • Provides virtual consolidated view and single point of access to data stores throughout the network • More issues resolved at tier 1 • Reduction in training (incremental) • Reduction in Support Staff • Simplified data interfaces by using profile views
Process Consistency & M&P	• Reduction in training (incremental) • Reduction in Support Staff

Table 2. IMS Operations Advantages over PS

Time to Market Savings

Figure 3 illustrates which time to market process areas in the OCAM were derived from the eTOM™ model. Six high-level process areas were studied:

- New Service Introduction
- New Service Development
- Service Creation and Implementation
- Service Readiness Verification
- Service Deployment and Launch
- Post Service Analysis

Each high-level process area is decomposed into further detailed process step (at 2 levels downward). In total, there are more than 110 detailed process steps with specific time information (e.g., number of days to perform a task) in the OCAM.

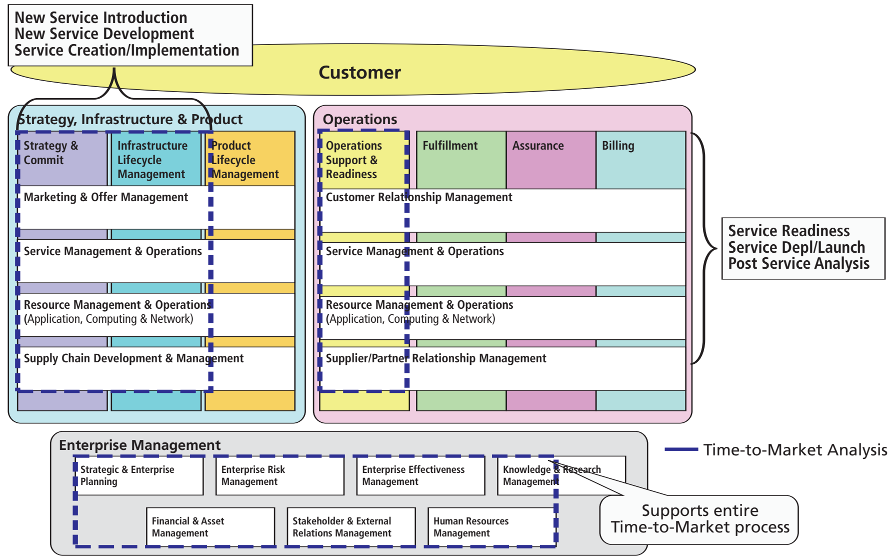

Figure 3. eTOM™ Model (Level 2) and OCAM Time to Market Process Areas

Figure 4 illustrates the time savings identified by our study in each of the six operations areas within the time to market processes. Overall, IMS shows a 20% advantage over PS for time to market. Key tasks/activities within each process area, which benefit from IMS infrastructure, are depicted in Figure 4.

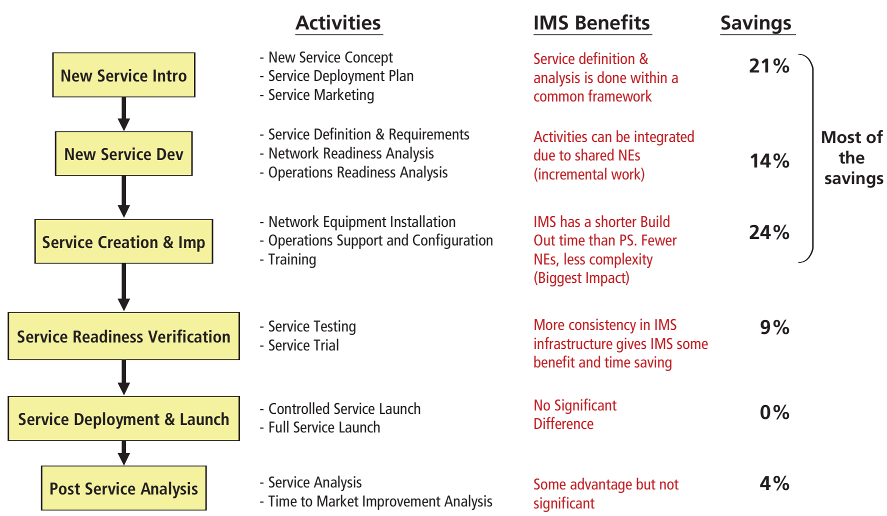

Figure 4. IMS Advantages over PS in Time to Market

Conclusions

In our study, use of IMS infrastructure showed an overall operations cost savings of 20-25%, with the largest absolute impact in the area of customer management. These savings were largely due to the consistent framework of IMS, which:

- Utilizes shared platforms
- Allows for incremental updates
- Eases data and information retrieval by using unified/consistent data schema
- Facilitates consistent processes and M&P re-use.

The study also showed a shorter time to market (~20%) due to:

- Common network architecture framework
- Common platforms
- Reusability of work done for previous applications

The resulting operations cost savings and revenue benefits from early TTM can be folded into an overall IMS business case.

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About the Authors

Vanita Katkar

Vanita Katkar is a manager of Advanced Network Operations Planning & Modeling team in Bell Labs. During her 20+ years of career at Lucent, she has held several technology and business leadership positions and has led pioneering efforts in converged network solutions, network architectures, streaming video services, network operations and switching systems. She holds a BS and MS in Mathematics and has several publications in BLTJ and major conferences. Her current work is focused on next generation network operations and development of models & techniques for network migration, optimizing operations costs and service management metrics

Ming C. Chu

Ming Chu is a Senior Manager in Lucent Worldwide Services' Managed Services Practice. He received a B.Sc. in electrical engineering from the University of Saskatchewan and his professional engineering status from the Association of Professional Engineers and Geoscientists of Saskatchewan (APEGS). He has developed operations models, services and written numerous whitepapers on next-generation network management.

Paul Wu

Paul Wu is a Distinguished Member of Technical Staff in Bell Labs at Lucent Technologies, where he has been a lead expert in IMS OPEX and control plane modeling. He also realized robust risk management practices throughout Lucent and developed network and software risk management services for Lucent's key customers. Application of these practices has had positive impacts on revenues and cost reductions in the hundreds of millions of dollars. His most recent professional conference participations and publications include Bell Labs Technical Journal, NIST process information technology standardization/collaboration, INFORMS conference, SARB review, keynote speaker of Executive Symposium at City University of Hong Kong, Concurrent Engineering Workshop, and WITNESS Simulation Conference. Paul has a Ph.D. degree in Industrial Systems Engineering from the Ohio State University.

Deirdre Doherty

Deirdre Doherty is a technical manager at Bell Labs with over 20 years of experience in network planning, design, and systems engineering. Her current work focuses on evolution to Next Generation Networks and IMS. Previously, she has managed teams in Bell Labs and AT&T's local and toll engineering and operations organizations, focusing on switching, signaling, and optical networking. Deirdre has an MS in EE/CS from Princeton University, an MBA from Rutgers University, and a BS in EE from Stony Brook University.

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