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1 Executive summary

This document was commissioned by Cisco to provide guidance for communications service providers (CSPs) on the benefits and returns available from investment in the Cisco Prime product suite. The Cisco Prime suite potentially has an impact on a number of processes within a CSP, and this paper provides details of the more significant of these. Guidance is also provided on the metrics that can be used to build tangible business benefits when creating a business case for the use of Cisco Prime.

The benefits for Cisco Prime need to be viewed in the context of larger business drivers in the market that are justifying investments in networks and services offerings. These investments drive operational support systems (OSS) projects as well as network equipment. Where network equipment sales are supported by a comprehensive suite of OSS software, such as Cisco Prime, projects tend to be easier to manage and as a consequence represent a lower risk of failure; lateness; or going over budget; thus providing an attractive proposition for CSPs. A comprehensive OSS suite should also provide ongoing operational savings as processes can be run faster, more accurately and consume fewer resources, to provide year-on-year savings. This paper considers only the processes that the Cisco Prime suite affects.

Cisco Prime helps users achieve their business goals in being able to help address cost, quality and revenue requirements. These benefits are summarised as:

- The ability to provide automations that reduce the time to create new services or implementing service orders and improve on previous processes that involved interfacing to multiple element management systems. This not only ensures services can be launched sooner and capture more revenue, but also reduces the cost of each service launch.

- The centralisation of network information and automated workflows help improve the quality of the data held, which drives up network utilisation rates.

- Automations and higher-quality data drive up better service quality, which in turn reduces calls to call centres and trouble tickets.

- The simplification of the complex element management systems (EMS) infrastructure to a single framework, with a single user interface, provides a reduction in resources needed to run management systems.

- Every implementation is unique and each will have different benefits, however the Cisco Prime approach and architecture should provide benefits to most CSPs once implemented and indirectly provide more competitive service offerings to the market.

2 Introduction

The remainder of this report is laid out in the following sections:

- **Industry business drivers**. Increasingly, business drivers are creating a significant number of projects that are partly or wholly dependent on implementing effective management systems. This section outlines some of the significant business drivers in the market that Cisco Prime can support.

- **Specific processes**. The advantages of Cisco Prime will hinge on the impact it has on processes and the improvements it is able to deliver to reduce resources and/or increase revenues. Processes need to be executed faster, cheaper or more accurately than before to support an investment in Cisco Prime. This section outlines the significant processes that Cisco Prime software affects.

- **Measurement metrics**. A tangible business case requires financial metrics to build investment justification. This section outlines the typical measurements that should be considered when building a business case for implementing Cisco Prime.

Each of the sections provides details of the components that support the goals of the business drivers. The drivers fall into two broad categories:

- **Increasing revenues**, through gaining new subscribers, increasing revenues per subscriber and retaining current subscribers.

- **Improving utilisation of resources**, through more accurate data and faster execution of processes that drive reductions in resources needed or delayed purchases.

Figure 2.1 shows the linkage between the business drivers, projects and processes, with each process helping to deliver against the two core business benefits of increasing revenues or improving efficiencies. Cisco Prime can be used as an important component in improving processes through its automation capability, and helping deliver business benefits and improve margins.
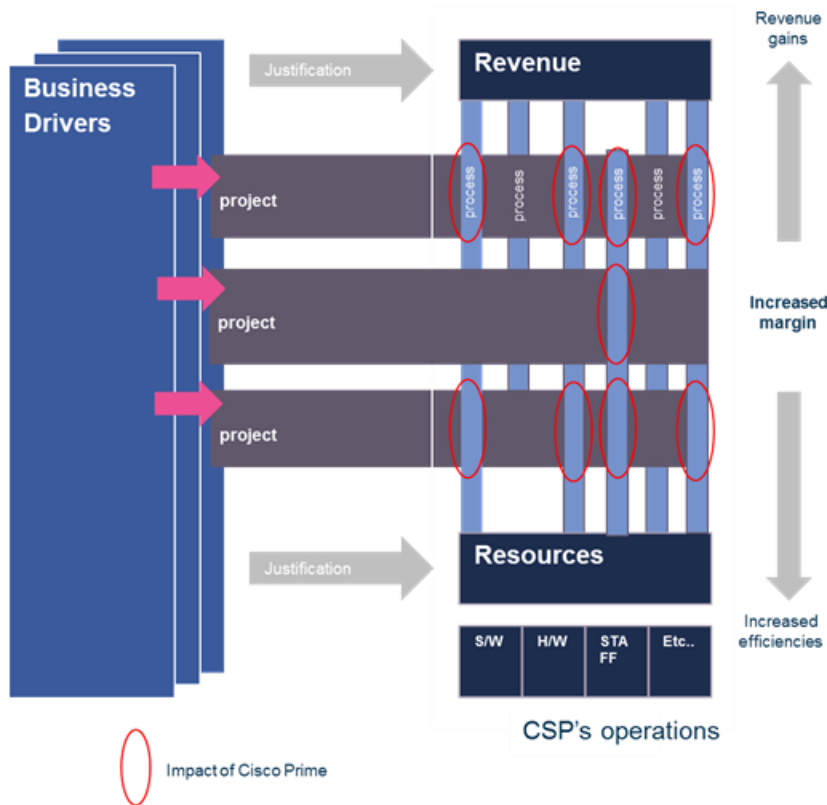
Figure 2.1: Linkage between business drivers and impact of Cisco Prime [Source: Analysys Mason, 2012]

3 Business drivers

Each regional market will have different business drivers as their level of maturity and local market conditions create unique characteristics. Analysys Mason, however, has noted some core business drivers that are creating significant projects and activity within all markets. These business drivers include:

3.1 Mobile data services growth

Mobile data services are growing in both data volumes and revenue and are particularly significant in developed markets today. Mobile data is driving demand for network equipment for: radio access networks (RANs), backhaul, core networking capability and associated management software. Increasing network complexity, more exacting subscriber demands and strong competition are all driving demand for management systems to provide greater quality and efficiencies in network design, implementation and assurance.

Service design and fulfilment processes are most important in the implementation for new service types as well as validation processes to ensure that they are configured correctly, making sure each new service operates as expected.

The Cisco product portfolio provides network solutions that support different aspects of mobile data including: unified RAN backhaul, LTE evolved packet core, core access solutions as well as femtocell solutions. Each network solution is supported by Cisco Prime functionality for implementation, operation and optimisation.

3.2 Drive for scale

CSPs are rationalising networks, servers, systems and service infrastructure, and apply resources across multiple services, customers and markets to build larger-scale operations to help reduce the unit cost of each service instance.

The drive to scale affects all processes within a CSP. There is, however, a more complex management requirement as the diversity of infrastructure, services and associated processes expands, requiring greater functionality within management systems.

Cisco's network solutions provide the ability to consolidate traffic on to next-generation network solutions such as: carrier Ethernet, core IP/MPLS routing solutions, optical solutions and a portfolio of edge network solutions. This helps drive down costs on network equipment and provides incremental, smooth expansion options. Cisco Prime provides a key component with its ability to work across different network technologies, to provide automated workflows and to reduce the number of disparate management system and associated servers, systems and processes.

3.3 Improvements to customer experience

Subscribers are requiring higher quality in their services and interactions with CSPs. Smartphones and demanding online applications require attributes such as connection for long periods of time; high-bandwidth low-latency connections for video, and "over-the-top" IP services, which are testing networks in unforeseen ways. Subscribers' expectations of CSP services are increasing, where service outages, poor customer service and late-to-market service offerings result in churn or increased calls to the customer support teams.

Service assurance processes are most critical in improving customer experience to help prevent and resolve service-affecting issues. With greater automation in design, fulfilment and order management processes, services eliminating manual intervention should also increase reliability.

Cisco Prime provides a cross-domain approach ensuring fewer provisioning errors and faster service delivery times. Faster troubleshooting of faults when they happen and the reduction of faults through predicting them before they occur, both help to create a better customer experience than was possible with previous Cisco management solutions.

4 Impact on business processes

Cisco Prime provides support to three key process areas within a CSP's operation: setting up new service offerings, activating service instances and providing assurance to infrastructure and services.

4.1 **Design/fulfilment**

Service fulfilment systems plan the future capacity and technology of the network, prepare the network to provide service, and plan and implement the changes required in the network and services layer to support the services as ordered by customers.

Key processes:

- **The design service capabilities processes** manage the design of the service infrastructure to meet the requirements in any approved investment proposals or new service type. This process dictates how fast a new service capability can be offered to market.

- **Design for non-standard sales proposals process**, where customer requirements cause a deviation from standard pre-defined workflow and service design process. This deviation causes a failure in an automated order fulfilment process and will require a manual intervention to create a customer-specific design. This is often the case for services created for larger enterprise accounts for example. Time reductions in this process enable non-standard service to be provisioned quickly and provide timely and robust service designs.

- **Tactical design requirements process**, where short-term requirements need a rapid change in the underlying network capability. These can include short-term capacity or network failure issues, short-term customer requirements or addressing service quality issues. These tend to be driven through the customer requirements and trouble-tickets, though longer-term network optimisation can also drive design changes. Where operations are repeated often, automations can be created to allow for less skilled staff to execute them, and or provide a faster and more reliable process.

Cisco Prime's features help provide support and automations in these processes. Examples include: auto-discovery of IP devices and automated diagnostics workflows to validate configurations.

4.2 Order management and activation

Order management systems control and report on the process of fulfilling service orders. Service orders may be requests for new service, but they may also be removal of services, movement of an established service to a new address or mobile device, or changes to an established service.

Activation systems automate the explicit commands to turn on a new service. They communicate with service layer databases, network management systems, element management systems, or directly with network elements.

Key processes:

- **Resource provisioning and activation processes** encompass allocation, implementation, configuration, activation and testing of specific services to meet customer requirements, or in response to requests from other processes to address service capacity shortfalls, availability concerns or failure conditions.

  The process may include:

  — implementing, configuring and activating specific services, as appropriate
  — reserving specific service parameters
  — recovering specific services
  — verifying whether specific service designs sought by customers are feasible as part of pre-order feasibility checks
  — allocating the appropriate specific service parameters to support service orders or requests from other processes

— decommissioning of an active service, and

— updating the Service Inventory Database to reflect that the specific service has been allocated, modified, deleted or recovered.

Cisco Prime provides intelligent fulfilment services that provision layer 2/3 and MPLS tunnelling services, and order-to-service and activation capability.

4.3 Assurance

Service management – service management is defined as the software systems that link customers with their own individual services. Service management systems enable CSPs to generate granular reports by customer and service to validate service-level commitments.

Fault and event management – fault and event management systems interface with the network elements and element management systems supplied by equipment manufacturers. They process millions of events per day, filtering downstream events in order to isolate and attempt to pinpoint the cause of a problem.

Performance monitoring – performance monitoring systems collect a continuous set of circuit-switched and packet data from the network elements and element management systems supplied by equipment manufacturers. They use SNMP polling, TL1 and other protocols to communicate with network elements or domain-specific applications to collect real-time or historical data.

Key processes:

- **Problem handling processes** are responsible for the management of problems reported by customers and associated with purchased product offerings and resolving them to the customer's satisfaction. The ability to resolve service issues faster is critical in reducing the number of trouble-tickets generated and the impact on customer experience.

- **Customer QoS/SLA management processes** encompass monitoring, managing and reporting of delivered quality of service (QoS) and how it relates against its service level agreements (SLAs) for specific product instances, and other service-related documents. They may include operational parameters such as resource performance and availability, but also encompass performance across all of a product's contractual or regulatory parameters, e.g. % completion on time for order requests, time to repair commitments, customer contact performance. Failure to meet a contracted SLA may lead to billing adjustments, which are handled by Billing and Collections Management.

- **Service problem management processes** are responsible for the management of problems associated with specific services. The processes cover the reporting of a service problem and instigating their restoration, or providing an alternative. Responsibilities of the service problem management processes include, but are not limited to:

  — detecting, analysing, managing and reporting on service-affecting events
  — initiating and managing service trouble reports
  — performing service problem localization analysis
  — correcting and resolving service problems
  — reporting progress on service trouble reports to other processes
  — assigning and tracking service problem testing and recovery activities, and

— managing service problem jeopardy conditions.

Service problem management processes activities need to interact with problem handling processes, as they are responsible for informing of potential customer problems.

Cisco Prime provides assurance capability that includes automated detection and isolation workflows and configuration management to restore network elements.
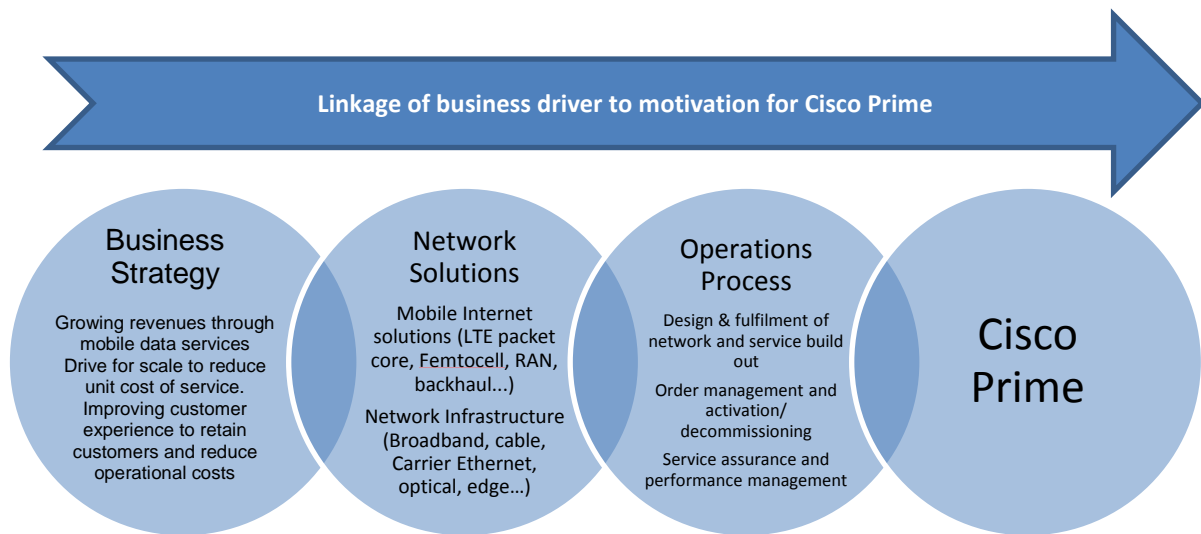
5 Measurement parameters

Cisco Prime has the potential to positively affect each of the processes outlined in the previous section, through performing processes faster, more accurately and at low costs or using fewer resources than previously deployed. Although many of the metrics concentrate on the reduction of costs, greater gains may be attributed to increased revenues from better service offerings that are earlier to market and potentially priced more competitively. Increases in revenue are highly dependent on each CSP's situation.

For illustration purposes, it is assumed that the environment that Cisco Prime will be implemented in would be comparable to that provided by multiple stand-alone element management systems each tied to a specific technology domain, and that there would be multiple technologies deployed.

Cisco Prime has the additional benefit of helping to reduce the management systems costs, through server rationalisation, moving to virtual servers and reducing staff training costs.

Implementation of Cisco Prime can provide a direct linkage to business strategies, providing time savings, more efficient use of resources and indirectly help increase revenue as outlined in Figure 5.1.

Figure 5.1: Linkage between Cisco Prime and business strategies [Source: Analysys Mason. 2011]

Linkage of business driver to motivation for Cisco Prime

Business Strategy

Growing revenues through mobile data services
Drive for scale to reduce unit cost of service.
Improving customer experience to retain customers and reduce operational costs

Network Solutions

Mobile Internet solutions (LTE packet core, Femtocell, RAN, backhaul...)

Network Infrastructure (Broadband, cable, Carrier Ethernet, optical, edge...)

Operations Process

Design & fulfilment of network and service build out

Order management and activation/decommissioning

Service assurance and performance management

Cisco Prime

5.1 Time reduction

Cisco Prime helps reduce both the time and resources needed to complete key processes, providing savings and improving quality. This can be through the use of automated workflows in Cisco Prime replacing manual complex command line interface (CLI) interventions and the use of multiple standalone management systems needed prior to Cisco Prime for each network domain.

Time savings represent a gain in productivity for a given resource that was responsible for performing a certain task. This could result in doing more with the same level of resource or reducing the resourcing levels. Time savings affect the speed to market for new services and improve the time to repair service issues.

Examples of these benefits include:

*   Reducing the design processes for service set-up through: automations, more accurate data on network elements and fewer misconfigurations.

*   Time saving for the provisioning and activation for service instances, through automated processes and fewer misconfigurations.

*   Savings on diagnosing implementation issues, in having a single data source and common tool set for multiple network domains.

*   Saving on device configuration through automation of common processes for trouble-ticketing and routine maintenance for additions, deletions and changes to network equipment.

*   Reducing the effort for network auditing, having a single data source.

- Time savings regarding capacity planning, through having a single data source.

- Reduction in effort in troubleshooting issues by having a single data source and access to a common tool set for different network domains. This results in a lower mean time to resolve (MTTR). More accurate root cause analysis (RCA) information not only reduces time to fix, but proves a better service to subscribers. This can directly affect margins if SLAs are violated.

- Time savings regarding OSS integration, as fewer systems are required for integration.

- Time savings on systems maintenance for management systems, through utilisation of virtual machines and fewer servers.

5.2 Improvements in capital resource utilisation

Increased automations and workflows will lead to improvements in the quality of data held within CSPs, this provides the potential to improve utilisations rates on capital assets such as network elements, but also other indirect operational assets such as servers, software licences and call centre infrastructure.

Some examples of this could include:

- Reduction in capital costs through more accurate records of service and physical inventory on systems and network elements. This helps reduce the need to purchase more infrastructure through locating assets that are not being used, so-called "stranded assets", ensuring higher utilisations rates on current equipment and greater confidence in predicting usage to reduce the quantity of spare inventory needed.

- Cisco Prime's management systems based on a common platform enable better utilisation of servers and licence revenues and can lead to the adoption of lower cost commodity servers if required.

5.3 Metrics of measurement

To build a business case for the deployment of Cisco Prime, each benefit in time or resource saving needs to be monetised to compare against implementation costs. Although these benefits are complex to calculate, where Cisco Prime can be directly attributable to increasing revenues they should also be considered as a part of the business benefits of Cisco Prime.

Figure 5.2 below outlines some examples of the associated metrics for savings and revenue gains that are applicable to Cisco Prime.

Figure 5.2: Examples of associated metrics for savings and revenue gains applicable to Cisco Prime [Source: Analysys Mason, 2012]

Type	Description	Metric	Units
Revenue	The ability to increase revenue by winning more business, through launching new services faster, delivering service instance quicker and providing more competitive services in the market (through increased	Number of days earlier that a service was launched	Revenue per day per service
		Savings from not paying out when SLAs have been violated	Retained revenue from not paying out SLAs

Type	Description	Metric	Units
	performance, more aggressive SLAs, and more competitively priced offerings)	Fall in churn rate that is attributable to Cisco Prime	Average revenue per subscriber retained multiplied by average revenue per subscriber
		Number of instances that are delivered at least a day earlier multiplied by the associated revenue	Total revenue per day per service instance
Productivity	The value of reducing time of a given operation is translated into a dollar value. This may be implemented by a reduction in operational resources or provide the ability to do more with the same resources	Average man-day savings on service design processes per year	Average cost of engineer resource multiplied by saved man-days
		Average man-day savings in provisioning and activation process per service order multiplied by total number of service orders per year	Average cost of engineer resource multiplied by saved man-days
		Average reduction in the mean time to resolve (MTTR) trouble-tickets in man-days multiplied by the number of trouble-tickets per year	Average cost of engineer resource multiplied by saved man-days
		Time savings on IT systems for management systems, through utilisation of virtual machines and fewer servers	Average cost of engineer resource multiplied by saved man-days
		Reduction in system integration and associated maintenance in man-days	Average cost of engineer resource multiplied by saved man-days
		Reduction in trouble-tickets per year multiplied by MTTR in man-days. (also to include customer services)	Average cost of engineer resource multiplied by saved man-days
		Time savings performing capacity planning multiplied by number of capacity planning sessions per year	Average cost of engineer resource multiplied by saved man-days

Type	Description	Metric	Units
		Average man-days saved performing network audits multiplied by number of audits per year	Average cost of engineer resource multiplied by saved man-days

5.4 Business benefit calculation

Each Cisco Prime benefit should be considered over an appropriate planning cycle; Figure 5.3 below shows an example over a three-year period. The costs associated with implementing Cisco Prime need to be input both at the time of implementation and any subsequent ongoing costs in order to calculate the project net present value or pay-back period. The example below shows an 18-month pay-back period and a net present value of USD449 000.
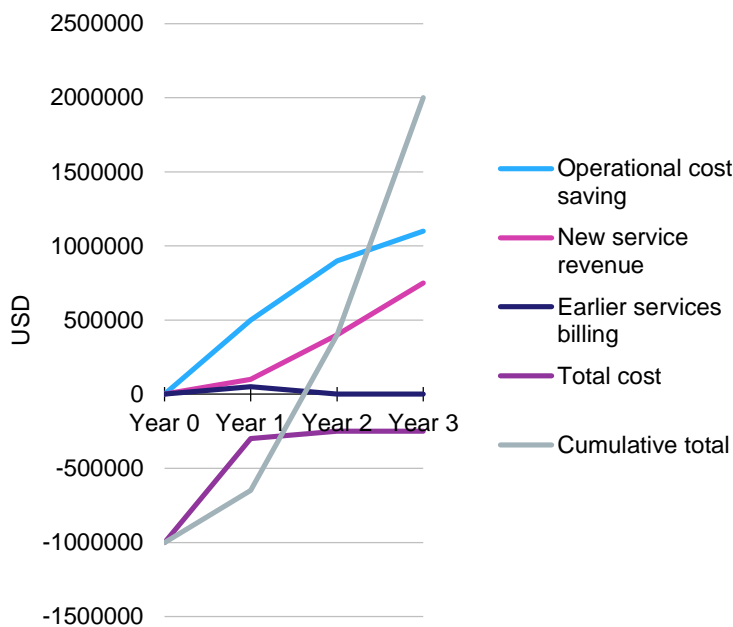
Figure 5.3: Illustration of a project with benefits and costs [Source: Analysys Mason, 2012]

Measurement parameters

About the author

Justin van der Lande (Senior Analyst) is Lead Analyst for Analysys Mason's Revenue Management research programme, which is part of the Telecoms Software research stream. His primary areas of specialisation include converged billing systems, billing strategies and business analytics for mobile data services. He also provides project management for large-scale projects within our Telecoms Software research. Justin has more than 20 years' experience in the communications industry in software development, marketing and research. He has held senior positions at NCR/AT&T, Micromuse (IBM), Granite Systems (Telcordia) and at the TM Forum. Justin holds a B.Sc. in Management Science and Computer Studies from the University of Wales. He is based in our London office.

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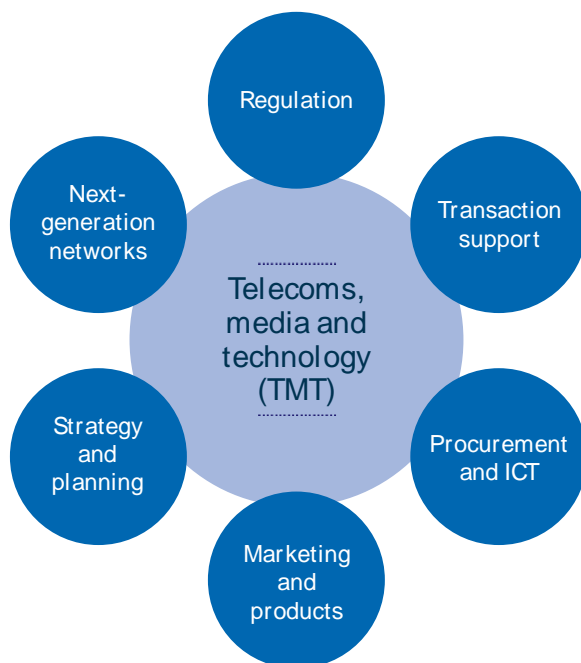
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Network Technologies	Fixed Networks	Wireless Networks	Spectrum	
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