Lucent Technologies
Bell Labs Innovations

Business Solutions

for GSM Network Operators

In the highly competitive Global System for Mobile (GSM) communications business, customers expect and demand outstanding service from their network operator.

No matter how technologically advanced they may be, network services alone will not ensure success. Providing network services is only part of the task. To ensure customer loyalty and profitable growth, operators have to do much more – they have to manage an entire business. Lucent Technologies is well renowned as a manufacturer of telecommunications network infrastructure, and supplies complete GSM systems to network operators around the world.



Our technological credentials are unequalled.

Moreover, our long history of working closely with wireline and wireless network operators has given us a wealth of experience in all aspects of running a telecommunications business.

As part of our service, Lucent is ready to advise you on every aspect of setting up or expanding not just your network but many of your important business functions.

Our aim is to give you the power to deliver innovative services and operate at maximum efficiency – both now and far into the future.

Increase your earnings

One of the keys to running a successful business is using every opportunity both to generate new revenue and to stop revenue leakage.

Generating New Revenue

Average revenue per subscriber is falling, therefore it is essential that you optimise your business operations. One way of doing this is by utilising information about your subscribers and their calling habits. In this way, you can increase loyalty and introduce innovative ways to encourage them to spend more.

Stopping Revenue Leakage

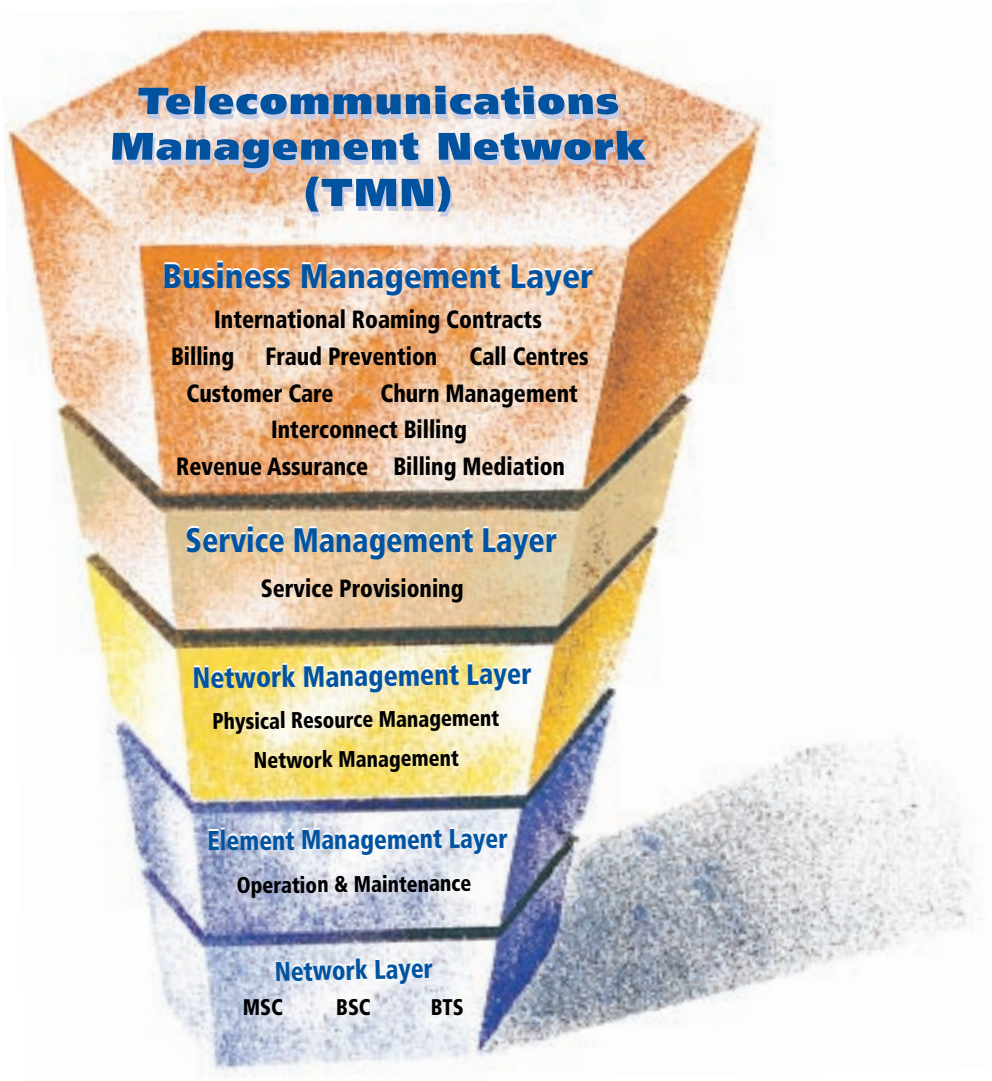
It has been estimated that as much as 5% of annual revenue can be lost every year through 'leakage'. The causes of this include human error, external or internal environmental factors, and flawed processes. To control this loss of revenue, you need to implement systems that address each cause.

Manage Capital - Control Costs

You can also increase the profitability of your network by managing capital and controlling costs. Setting up and maintaining a GSM network is a huge investment. To minimise the costs of running and operating your network, it is crucial that you use all resources efficiently.

Management Applications

Telecommunications Management Network (TMN), as defined by the



– decrease your losses

International Telecommunication Union - Telephony (ITU-T), is a set of recommendations specifically formulated to provide integrated management of telecommunications networks using an agreed architecture and a set of standardised interfaces.

Lucent offers a comprehensive range of management applications which conform to these standards. When implemented as part of your complete business process, these systems will help ensure that losses are kept to a minimum and profits raised to a maximum.
The products we offer belong to the following three TMN layers:

- ***Business Management***
- ***Service Management***
- ***Network Management***

Taken together, these domains cover much of the business and administrative side of running a telecommunications network by focussing on the following areas within your company:

- Billing
- Customer Care
- Finance
- Fraud
- Marketing
- Network Operations
- Quality Assurance

Business Management

Billing and Customer Care (BACC) System

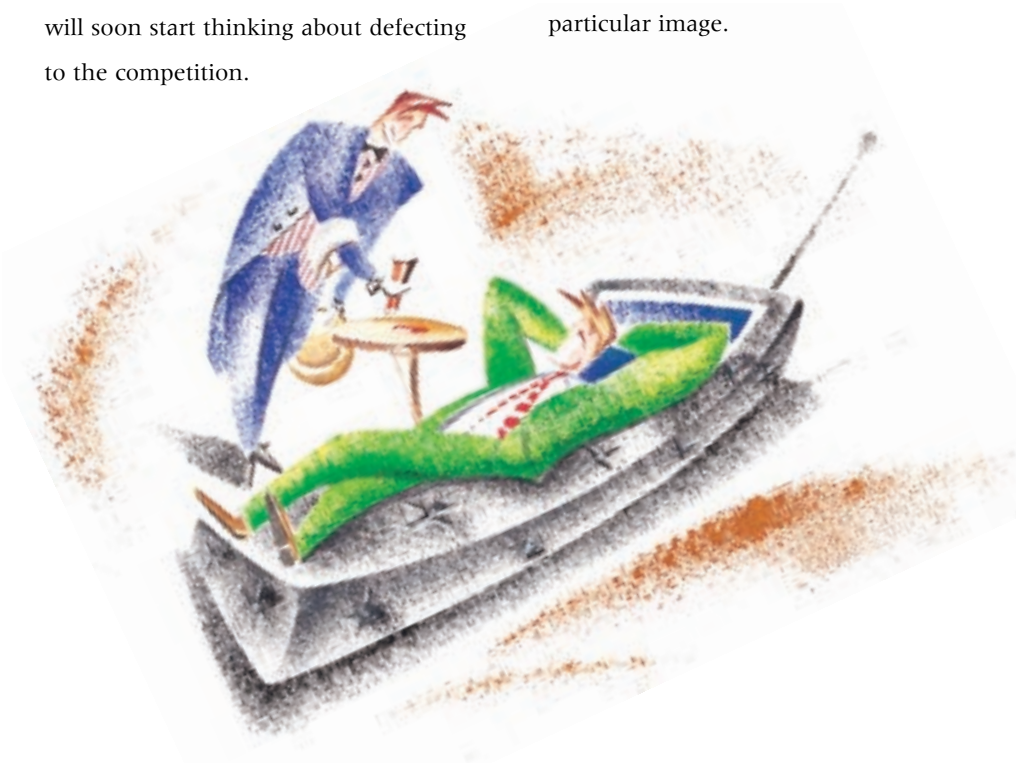
Maximise Returns With Effective Use Of Billing And Subscriber Data

The billing and customer care application is the 'front end' of your relationship with subscribers. Every call coming into your customer care centre, and every bill going out, represents an opportunity for personal contact with your subscribers – an opportunity not to be missed. Poor customer care and inaccurate or unclear bills, however, will quickly lead to dissatisfied subscribers, who will soon start thinking about defecting to the competition.

If you are to succeed in attracting and retaining subscribers in the highly competitive world of mobile telecommunications, the choice of BACC system is therefore vital.

Critical Functions In A BACC System

The functions of a complete billing and customer care system are manifold and complex. BACC systems may have to cope with hundreds of thousands of subscribers and millions of calls. Therefore, speed of processing and response times are critical. Moreover, because this is the main point of contact with your subscribers, it is perhaps your BACC system that requires the most extensive customisation, so as to suit your special requirements and reflect your particular image.



When choosing a BACC system, you should look for the following basic functions:

- Subscriber management (consumers and corporate)
- Provisioning (interface to HLR to activate/deactivate network services)
- Accounts receivable / payment processing / bank interfaces
- Tariff maintenance
- Discounts
- Call rating (real time)
- Bill generation (collecting all the billing information – e.g. usage and recurring charges)
- Bill production (choice of medium – formatting the bills in the style you would like)
- SIM management
- Number management
- International roaming (must support the GSM Transferred Accounts Procedures (TAP) standard)
- Interconnection with other network operators
- Retailer management
- Management reporting

Our BACC System Offers All This, And More

Lucent has selected a powerful BACC system, whose suite of modules offers all these basic elements. You can select these modules according to your own particular business requirements, making our system extremely flexible. Also, the scalability of the product minimises your initial outlay and allows for future expansion when you need it.

Billing Mediation System

Maximise The Full Potential Of Your Billing Data

All Call Detail Records (CDRs) originating on your network must be forwarded to your BACC system so that they can be used to generate invoices for your subscribers. There must, therefore, be an interface between all the switches and the BACC system. Here, you have two options: a direct interface or a billing mediation system.

Direct Interface

A direct interface feeds CDR information straight into the billing system, which then forwards the data to other downstream applications. However, this generally delays the processing of the data, and requires you to use staff and equipment best reserved for other tasks. In addition, as your network expands and the number of subscribers and calls increases, you need to have usage data readily available for more sophisticated processing and analysis.

Billing Mediation System

A billing mediation system collects CDRs from the various switches in your network and distributes them simultaneously to many downstream applications such as the BACC and fraud prevention systems. The benefits of this are that it speeds up CDR processing, and that all the downstream applications are protected from changes in the switching software.

A Billing Mediation System That Lets You Profit From Your Data

Lucent can offer you a robust billing mediation system which provides the benefits described above. It is designed specifically to help you maximise the value of your call data, and includes the following functions:

- Editing and validation of records (e.g. incomplete records)
- Browsing (converting records so that they can be viewed or printed)
- Reformatting (e.g. usage records from different switches can be standardised for the billing system)
- Filtering (e.g. removing all zero-rated calls)
- Searching (looking for specific records – e.g. for fraud prevention)

Fraud Prevention System

Clamp Down On Fraud And Keep Losses To A Minimum

Unfortunately, all network operators fall victim to a small number of

unscrupulous 'subscribers' who misuse the services provided, and have no intention of paying their bills. The financial impact on you, the operator, is potentially enormous. Average figures for fraud losses range from 3% to 10% of annual revenue. You must, therefore, be ready to combat fraud from the very first day you launch your service.



Tracking Suspicious Calling Patterns

The fundamental concept behind a fraud prevention system is that detectable changes occur and distinct calling patterns emerge when an account is accessed illegally, or when the registered user has no intention of paying the bill.

The fraud prevention system analyses CDRs and creates individual usage profiles for each subscriber. These profiles are updated, referenced and analysed call by call. You can also pre-define usage thresholds for each subscriber. By constantly monitoring calls, comparing new information with historical data, and checking the subscriber's usage threshold, the system automatically evaluates call patterns for signs of suspicious activity. You can then examine this data, and decide whether to take corrective action, according to your own specific policies and procedures.

Early Detection Produces Long-Lasting Benefits

Lucent's fraud prevention software system can be integrated into your customer care solution. It helps you to detect fraudulent usage as early as possible, thus protecting both honest subscribers and your revenues.
The software system is scalable, allowing you to expand its capacity to support ever-increasing subscriber numbers and call traffic. Experience has shown that the savings made by successfully combating fraud can quickly cover the cost of investing in the fraud prevention system.

Churn Management System

Reduce Churn – Reduce Costs

Subscriber churn is now one of the most important financial concerns for cellular network operators. In some countries, churn levels have reached 30% of the subscriber base. Given that signing up a new subscriber can cost between five and six times more than managing an existing one, churn is clearly a serious drain on your revenues. Subscribers change operators predominantly because of lack of coverage, poor customer care , inferior network service and incorrect billing, or because they can find better prices elsewhere.

Identifying Potential Dissatisfaction, And Resolving It

Lucent can provide a software package designed specifically to help you combat churn. As part of your complete customer care solution, our churn management system can significantly contribute to increased customer loyalty, and thus increased revenues and profit margins.

Our churn management system uses a number of different variables to provide the network operator with 'churn values'. These identify which subscribers are 'at risk', enabling you to take action before they decide to leave.



Call Centre

Win Subscriber Loyalty With First-Rate Customer Service

Your choice of a billing and customer care system is crucial for the efficient management of your subscriber base. However, even the best BACC system cannot operate effectively in isolation.

Dissatisfaction with customer service is one of the main causes of subscriber churn. Typically, if subscribers want to ask a question, report a problem, or request additional services, they will call you. It is extremely frustrating to phone a company, and find that all their lines are busy or no one answers; surveys have shown that by the fifth ringing tone, callers start to lose patience. Network operators must therefore install a first-rate call centre to support their customer care operations.

A key benefit of call centres is that they help to automate and personalise service to your subscribers. By handling subscribers' questions efficiently, your call centre enhances your image as a responsive and professional operator.

Features That Enhance Call Centre Performance

Lucent is a premier supplier of call centre solutions. We can provide you with a complete solution to help ensure that your subscribers enjoy fast, efficient service, and that you can make optimum use of your call centre personnel. Among our solution's features are:

- Automated Call Distribution (ACD) – manages queues of calls, and directs calls to staff with the appropriate skills.
- Computer Telephony Integration (CTI) – integrates the call centre with the BACC system. When a call is connected, subscriber details appear simultaneously on the BACC screen.

- Interactive Voice Response (IVR) – directs a call by offering the caller pre-defined options (e.g. "If your query is about billing, press 1."). The IVR module can also answer many standard questions without requiring any human intervention.
- Speech Recognition – can recognise simple words and numbers in different languages and accents. Like IVR, the speech recognition module can direct and answer calls. It is particularly useful in areas where touchtone telephones are not widely used.
- Predictive Dialler – pre-programmes outgoing calls (e.g. for telemarketing, account collections and returning customer calls).

A Call Centre Built And Designed Around Your Needs

Like many products in Lucent's GSM portfolio, the call centre can be tailored to match your unique requirements. From basic ACD to sophisticated call routing between networked customer care centres, our solution can grow to keep pace with your subscriber base.

Revenue Assurance System

Eliminate Billing Errors – Eliminate Revenue Leakage

No matter how good your network and billing systems are, discrepancies still occur. For example, an incorrectly set switch clock causes calls to be registered in the wrong tariff period, or call durations to be measured inaccurately; CDRs are corrupt, and cannot be billed; a tariff is not set up correctly in the billing module, so the call is not charged accurately.
All these situations may reduce your revenues. What you need, therefore, is some form of 'external audit' to ensure that any discrepancies are detected and corrected as quickly as possible.

Ensuring That No Revenue Goes Astray

Lucent offers a sophisticated system which tests the accuracy of CDRs coming from the switches, and also of rated calls produced by the billing system. This is achieved by automatically generating and pricing test calls. The metering, collection and rating process is complex, and a major benefit of our system is that it is possible to pinpoint exactly where in the process any error occurred.
Our revenue assurance system is extremely simple to use and very cost-effective. It can be scaled according to the number of switches in your network and the level of testing you wish to perform. A further advantage is that the system can be used to satisfy requirements that may be applied by an official telecommunications regulator.



International Roaming

Exploit The Opportunities Of Roaming To Generate Additional Revenue

International roaming is a feature exclusive to GSM, and offers a major advantage over other telecommunications standards. For you, the financial benefits of GSM are potentially substantial. You can greatly increase your subscriber base by allowing visitors from abroad to 'roam' on your network. With huge numbers of business people and tourists travelling around the world every day of the year, as much as one quarter of your annual revenue can come from roaming.

A Centralised Roaming Agreement Ensures Maximum GSM Income

If no roaming agreement exists, your subscribers are temporarily 'out of coverage' every time they go abroad. Traditionally, this situation is managed by setting up a bilateral roaming agreement – that is, two network operators agree to let each other's subscribers roam on their respective networks. Such agreements, however, can take a lot of time and effort to prepare, implement and test, and have to be arranged on an operator-by-operator basis.

A centralised roaming agreement is a viable low-cost alternative. Lucent can assist you in organising such an agreement so that from day one you can enjoy all the benefits of international roaming with most GSM networks throughout the world.

Service Management

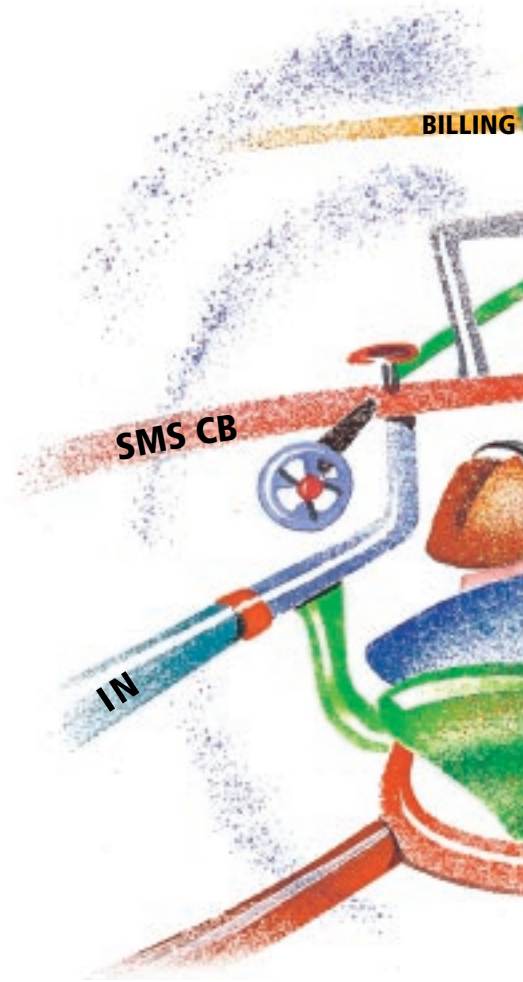
Service Provisioning

The Importance Of Prompt Service Provision

Service provisioning systems that rely on manual intervention produce time-consuming and error-prone processes which frequently result in the services being delayed, provisioned incorrectly or, worse, failing completely. The time taken by Customer Care Representatives (CCRs) to correct these errors, or to deal with dissatisfied subscribers, is unproductive, and represents an unnecessary addition to your business costs. Moreover, your subscribers will quickly become disillusioned with your performance, and might defect to your competition.

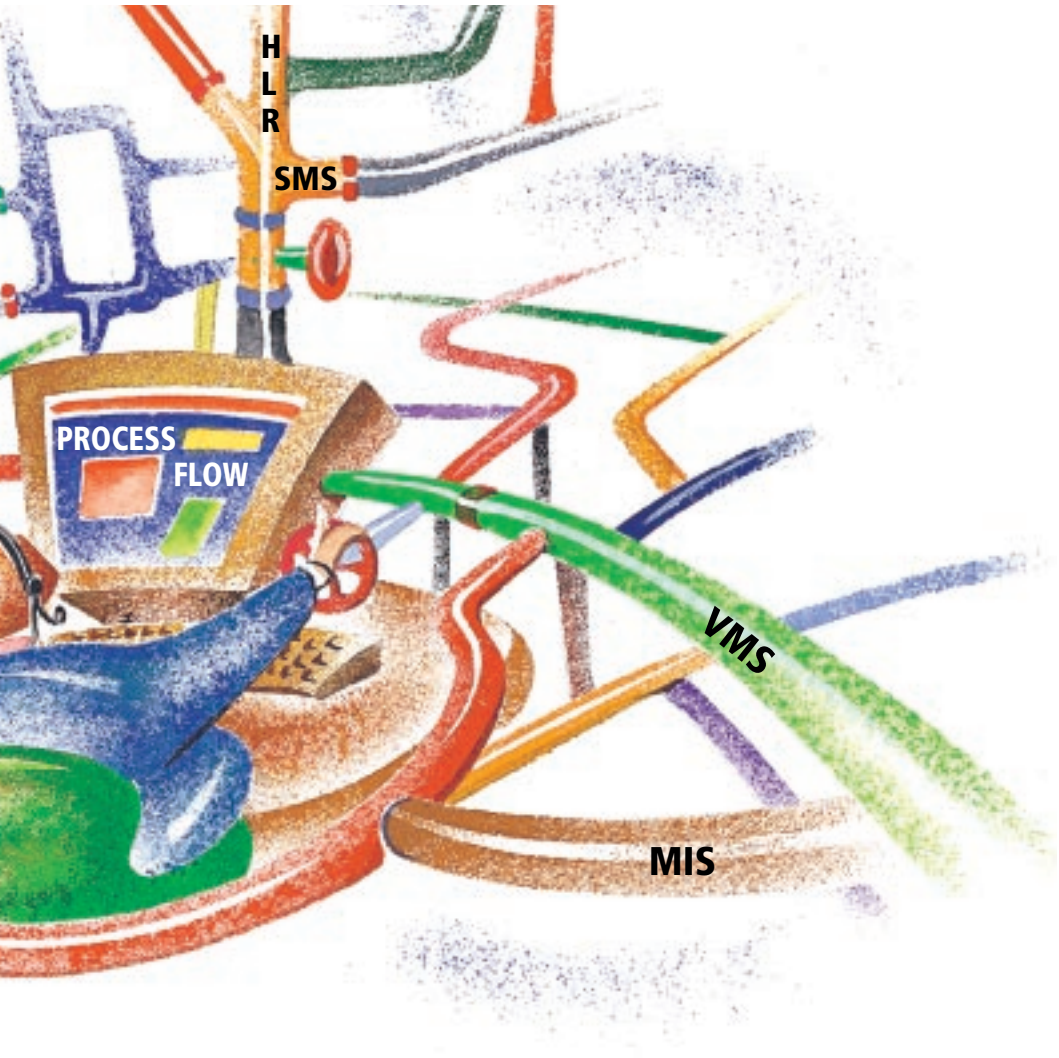
Automated Processes Offer Speed And Flexibility

To deliver a cost effective quality service that will meet or exceed subscribers' expectations, it is vital to optimise your enterprise-wide business



processes. An automated service provisioning function is faster, thus achieving significant time savings and because it is procedure-driven, it is also much more efficient. Lucent's solution helps you to coordinate work and information flows effectively.

As your network grows, you will want to offer your subscribers much more than just the standard GSM services, so the solution you choose must have the versatility to manage the provisioning of a whole range of products.



In addition, your automated service provisioning solution must be 'future-proof' – flexible enough to let your processes evolve as your business needs change, or as new services and technologies emerge.

Lucent's Service Provisioning Management Solution Offers Numerous Benefits

Lucent's solution ensures end-to-end automation of the service provisioning process – from the initial subscriber call to the final confirmation of the completed order. In this way, we provide you with a 'one-stop shopping' source for your provisioning needs.

Our service provisioning management solution delivers the following features and benefits:

- Automated processes reduce the operational cost of completing subscriber orders and maintenance requests.
- Streamlined, centrally controlled processes improve response times to subscriber enquiries and create superior service.
- Accelerated, accurate execution of simple tasks increases the productivity of CCRs, thereby giving them more time to offer additional revenue generating services to the subscriber.
- Managed Service Level Agreements (SLAs) ensure that commitments made to subscribers are met. The collected statistics provide the ability to continually monitor and report on performance and trends.
- Standardised and monitored processes ensure that alerts are responded to and acted upon correctly, while proactively managing thresholds and capacity.
- Improved time-to-market for Value Added Services and other products.
- Enhanced service support for subscribers, distinguishing you from your competitors.
- Fewer expensive upgrades, and simplified testing of interfaces as new services and network upgrades are introduced.
- Conformity to the Telecommunications Management Network (TMN) service management recommendations.

Network Management

Network Management System

Control Costs And Improve Quality Of Service

Proactive network management is critical in ensuring that subscribers get the quality of service they expect, 24 hours a day, 7 days a week. This can best be achieved through a centralised and automated surveillance and management system, which combines high performance levels with cost-efficiency.

A quality Network Management System (NMS) allows you to identify problems in their initial stages, quickly assess the impact on your network and subscribers, and resolve the problems in as short a time as possible.

The benefits to you are clear. Network downtime causes loss of revenue, and can lead to loss of subscribers. By maximising network availability, the NMS maximises profits – both by keeping productive network activity at peak level, and by ensuring that subscribers remain impressed by the reliability of your service.

We Can Provide The NMS That's Right For You

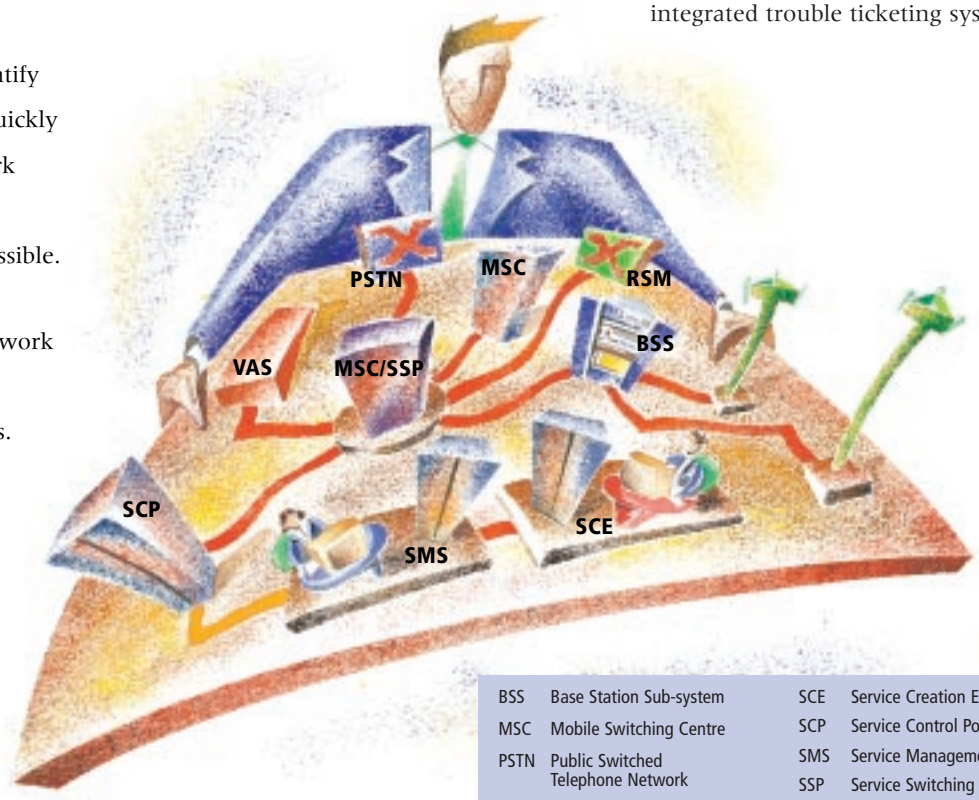
Lucent is a front-runner in network management systems. Our NMSs are designed to work with network elements from most equipment vendors, and offer all the benefits of a flexible, modular system. You can select an NMS which offers the capacity and features that are just right for your existing network. They can be expanded smoothly to meet future requirements, thereby reducing your initial capital investment and creating a path for virtually limitless network growth.

A Comprehensive, Detailed View Of Your Network

Lucent's NMS provides a picture of the state of the network at all levels – from the entire network, through the switches, the base stations, the transmission equipment and any Value Added Services or Intelligent Network devices, all the way down to the individual network elements.

Correcting Problems Quickly, And Avoiding Problems In The Future

Our NMS has a built-in real-time alarm system which alerts the operator to problems in the network equipment. Another feature is the integrated trouble ticketing system: as



BSS	Base Station Sub-system	SCE	Service Creation Environment
MSC	Mobile Switching Centre	SCP	Service Control Point
PSTN	Public Switched Telephone Network	SMS	Service Management System
		SSP	Service Switching Point
RSM	Remote Switching Module	VAS	Value Added Services

alarms are detected, they automatically populate a database of trouble tickets. These trouble tickets are tracked and updated until final resolution.

As the problems are solved, the system creates a database of the solutions, so that should the same problem occur in the future, it can be identified and therefore corrected more quickly. Typically, our NMS can reduce problem analysis time by as much as 50%. Indeed, in many cases the NMS can detect problem areas before service is affected.

Physical Resource Management System

Control Your Inventory – Control Your Costs

A GSM network can be extremely profitable. It also requires considerable investment to set up and maintain. To ensure that your investment produces the greatest return, and to counter the many competitive pressures that your business faces, it is essential to:

- Turn a higher percentage of network inventory into revenue-generating assets.
- Introduce new services and technologies quickly and cost-effectively.
- Increase productivity in design and provisioning operations.

Meeting these management challenges is essential to maintaining a competitive edge, and can be achieved with an effective Physical Resource Management (PRM) system. With such a system, you can manage physical network inventory, and deliver current and future services in the industry standard Telecommunications Management Network (TMN) environment.

A Comprehensive PRM System, For Enhanced Network Adaptability

Lucent offers a flexible PRM system that gives network engineers and planners critical design information, including an accurate accounting of existing network inventory, configuration, and capacity. It supports the entire design process, from service request through to implementation. In addition, the PRM system supports equipment from multiple vendors, thus giving you the flexibility to accommodate ongoing changes to your network architecture. While helping you to optimise your current network, it also provides ample flexibility for growth, expansion, and the introduction of future technologies.

Making The Most Of Your Inventory

Our PRM offers the following areas of functionality:

- Physical Network Inventory Management – supports additions and changes to the inventory database; provides visual displays and reports on inventory usage.
- Network Design Management – gives end-to-end support in service provisioning and network transport design, spanning a wide range of network technologies from different suppliers.
- Engineering Order Management – facilitates orders and automates scheduling, work assignment and provisioning processes.
- Network Database – provides accurate, high-quality inventory records.

The Complete Business Solution

Competitive pressures in the GSM marketplace are shifting the emphasis away from providing network services to operating as a customer focused profitable business. Proactive network management, efficient service provisioning, fraud prevention, accurate billing and reducing customer churn are just some of the major concerns for your business today.

Lucent's considerable experience of supplying business solutions to operators around the world qualifies us to provide you with the most effective systems to address these important concerns.

Lucent Technologies has been a leader in telecommunications for more than a hundred years. From microchips through to Business Solutions, our hardware and software solutions are used all around the world.
Bell Labs, Lucent's innovation engine, is at the forefront of telecommunications research and development, constantly refining current technologies and investigating new possibilities. Lucent also offers comprehensive and astute business consultation on issues such as marketing, sales and customer care. To learn more about how we might be able to help your business, or if you have any questions, we urge you to contact us.

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