

# New Generation Operational Support System

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## Abstract:

The paper introduces the present status and development objectives of the operational support systems of the three telecommunication operators in China and briefly describes the features of the new generation telecommunication operational support system (NGOSS), such as adopting the TMN/TOM structure, supporting the unified and multiple access processing, conducting effective and centralized management of data.

With the opening up of telecommunication industries, the high profit of the traditional services has been reduced because of the drastic competition. However, the continual implementation of new applications and services is especially important for the development of enterprises. The operating mode of the telecommunication operators has been changed from the traditional “network-oriented” mode to the “client-oriented” mode, step by step. This change makes the telecommunication operational support system increasingly important. In order to survive in the competitions, the main global telecommunication operators all invested large capital to improve the capability of the operational support system. Now it is a common idea that the level of telecommunication operational support system represents directly the operation management and service levels of telecommunication operators.

## 1 Present Status of Operational Support System in China

The three telecommunication operators in

China: China Telecom, China Mobile and China Unicom (CU), have constructed their own operational support systems. Because the management tactics of the three operators are different, their operational support systems have corresponding differences.

**China Telecom:** The operational support system is constructed at the prefecture level, including: “97” project, charging and accounting system, client service system, decision-making supporting system and network management system. The operational support system with the local network as a unit satisfies the existing operating mode of China Telecom fairly well. However, because there is no unified layout of the structure, service and data of the operational support system throughout the province, it is difficult to implement the service and unify the service standards across cities and regions. Moreover, the problem of function overlap and data overlap appears among the systems, and the service interface cannot be unified, so it is difficult to carry out the unification of client relation management (CRM). Under such actual conditions, the subcompanies in some provinces have begun to lay out a unified construction of the operational support system throughout the province.

**China Mobile:** The operational support system includes the business system, charging system, accounting system, client service system and network management system. Some systems take the prefecture as a unit for construction, such as a business system, accounting system, client service system, etc; some

systems adopt a concentrated mode of the whole province, such as a charging system, network management system, etc. To deal with the fierce competition in the mobile communication field in the country, China Mobile began BOSS (Business Operational support Service, excluding network management system) centralisation reconstruction since the first half of this year.

According to the requirements of centralized reconstruction criteria, China Mobile is carrying on the centralized reconstruction of existing business systems, charging, accounting and client service systems throughout every province. It is constructing operational support systems at two levels (national and provincial), and putting forward the requirement of the 3-level structure of “access level-application level-data level” based on the system structure. With the construction of the centralized BOSS throughout every province, the whole management level and operation level will be improved greatly.

**China Unicom:** CU laid out clear operational support system structures earlier, which can be called “one structure, multiple sub-systems”. It means constructing each sub-system respectively under a single operational support system. CU’s operational support system includes: integrated accounting, integrated payment, professional charging, client service and network management system, and at present, these systems adopt a centralized mode throughout the province.

The construction scheme of CU’s operational support systems accords with the features of China Unicom, who is an operator that provides most services in China. CU can also solve the contradiction of facing big service differences and providing unified service interfaces (all by one table-board, all by one bill) for users.

The three operators have realised the importance of unified operational support systems. Therefore, they are all laying out or carrying out unified operational support systems in order to solve the problems such as disunity of service interfaces, service overlap and data scattering, and to build a stable foundation for implementing client relation management, constructing an enterprise data centre and a

decision-making support system.

## 2 Development Goal of the Operational support System

According to the “client-oriented” operation principle, and with the guidance of the hierarchy of TMN/TOM (Telecom Operations Map), the structure of the new generation operational support system will be planned and implemented from top to bottom (i.e., from the business management layer to the network cell management layer).

According to the telecom management network (TMN) logical layer principle, in TOM systems, telecom service processing can be fulfilled at the following layers: customer interface management layer, customer service layer, service development and operation layer, network and system management layer, and network element management layer.

The client service layer usually includes processing procedures such as sales, order handling, problem handling, customer quality of service management, invoicing, and collections.

The service development and operation layer includes processing procedures such as service planning and development, service configuration, service problem management, service quality management and rating and discounting.

The network and system management layer includes processing procedures such as network planning and development, network provisioning, network inventory management, network maintenance and restoration and network data management.

TOM based service process structure is shown in Figure 1.

## 3 Characteristics of NGOSS

As a very important weapon of competition for telecom enterprises, the construction of NGOSS may directly affect an enterprise’s position in future competitions, so NGOSS should have the following characteristics:

(1) Adopt TMN/TOM structure

The system is designed based on the ITU-T TMN structure and TOM structure of the Telecom Management Forum. Therefore, it can provide a guarantee for the continuous devel-

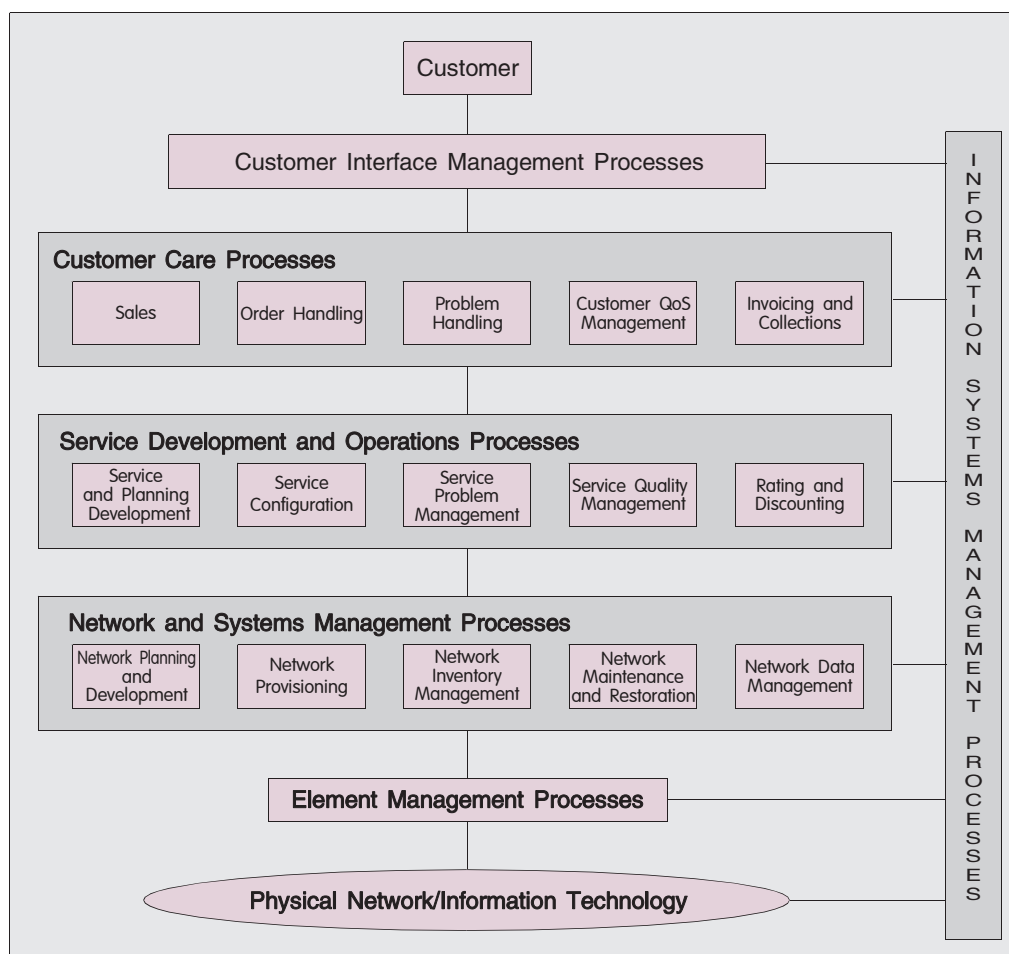


Figure 1. TOM based service process structure.

opment of the system structure, and fully represent the client-centered operation principle.

(2)Support unified and multiple access processing

The unification means that when the system provides a service for a client and no matter how the client accesses the system, the system provides a unified management platform. The multiplicity means that the system can provide multiple access modes such as through calling centre and the Internet, etc.

(3)Meet flexible service settings and future development

By way of changing service data, service creation environment and so on, the system allows telecom enterprises to be able to modify service flow flexibly and promote various services. At the same time, the system should satisfy the need of operators so that in the future they can provide new services to clients, support the change of call list formats and charging elements, and support the development

from current voice and data services to future multimedia services.

(4)Effective and centralized management of data

The system can provide centralized and effective data management through dividing fields, dividing classes and authentication. It builds a good foundation for enterprise to implement online analytical processing (OLAP) applications.

(5)Distributed design supporting large capacity

The system should adopt a distributed design, be flexible and support a continual increase of users.

(6)Adopt parameter controlled real time processing core

The system should be driven by data, so there is a data flow inside the system. Processing steps are set on this flow according to service settings. How to handle

specific services is controlled by parameters.

(7)Component design of software

By adopting the component design, the system makes each software component able to be combined with a new function module conveniently, which means that the system can both expand and further adopt new technologies.

(8)Client-oriented system

The client is the most valued wealth of any telecom enterprise. The system should be client oriented in designing the processing flow and formula of client service, charging and accounting.

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#### Biography

Tang Yan is currently a senior engineer with China Netcom Corporation Ltd. He has published over 5 scientific papers. His research interests include BSS/OSS and telecommunication network planning.