

Next-generation Telecom Management System

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OVERVIEW: The environment surrounding the telecom industry is undergoing great changes. Two key examples are the explosive growth of the Internet and suspension or abolishment of various laws and regulations. As a result of these changes, competition between telecom service providers is becoming severe, and the satisfaction of customer needs by quick provision of high-quality and inexpensive services has become a major issue. Here, the development of telecom management systems based on a Telecommunication Management Network (TMN) has taken on particular importance as a means of dealing with this issue. In light of the above, Hitachi is developing an integrated telecom management system featuring not only network/service management systems but also customer-care/business support systems, marketing/management support systems, and customer-management/billing systems. This system will run on an open distributed processing platform making use of Hitachi's extensive technical expertise accumulated over many years of developing information-processing systems. Hitachi hopes to make a significant contribution to the telecom industry through this telecom management system.

INTRODUCTION

DUE to the explosive growth of the Internet, the public communications network is making a transition from a voice-oriented communications network centered about the telephone to an information-oriented network centered about multimedia information consisting of

data, images, etc. Advances in optical communication technology and satellite communication technology are also making it possible for high-speed and large-capacity multimedia communications to be performed regardless of time and location. Indeed, true global info-communications services are beginning to be

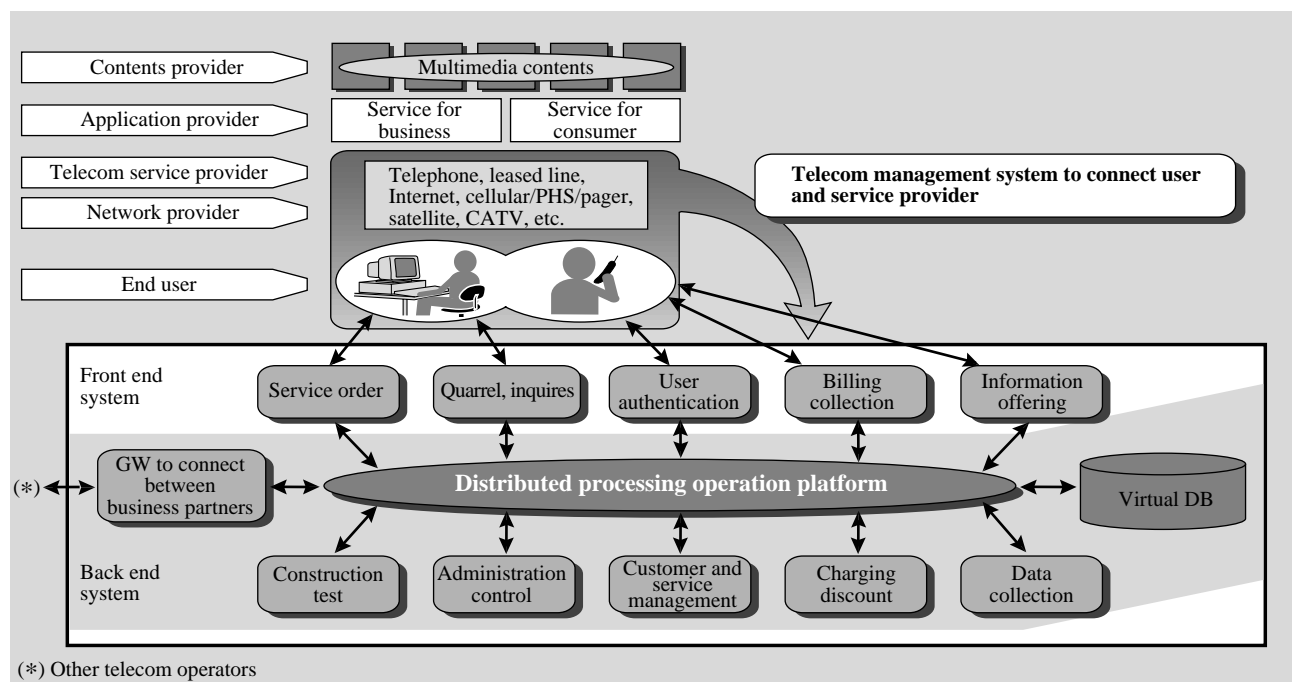


Fig. 1—Functions of an Integrated Telecom Management System.

offered as reflected by international roaming services typified by IMT-2000. At the same time, liberalization proceeds with respect to laws and regulations that telecom operators have had to work under up to now.

These changes in the environment surrounding the telecom industry are bringing about severe competition between communications service providers to a degree not seen in the past. Meeting the needs of customers has consequently become a major issue, with particular importance being attached to providing new services quickly, raising the quality of services, and providing them at reasonable prices.

In the above background, there is a great need for an integrated telecom management system that in addition to network and service management can also support the marketing and sales of new services, the management of customer services, and the collection of charges.

TECHNOLOGY TRENDS IN TELECOM MANAGEMENT

Standardization of a telecommunication management network (TMN) at ITU-T proceeds as a technology for achieving telecom management systems. The TMN is now being actively studied with focus on equipment management, network management, service management, and business management. The TeleManagement Forum (TMF) in particular is studying ways of achieving telecom management systems based on TMN for information service providers, and they have recommended a Telecom Operation Map (TOM) and a Technology Integration Map (TIM) in this regard. The TOM shows specific operation functions at each management level and the information flow between these functions. The TIM, on the other hand, presents guidelines on how to go about achieving TOM.

The base technology adopted for TIM is CORBA of OMG, and the protocols used for the management interface with equipment are Common Management Interface Protocol (CMIP) and Simple Network Management Protocol (SNMP). Web and Java technologies are adopted for customer/operational staff access. Achieving a telecom management system therefore requires the integrated application of technologies for achieving a distributed information processing system.

REQUIREMENTS OF TELECOM MANAGEMENT

The following requirements can be considered when

developing a telecom management system;

- Links with each operation function and with other systems to achieve business flow-through
- Uniform processing and management of multiple databases since multiple operation functions and systems process the same kind of data
- Easy addition or enhancement of functions to be required for long-term development
- Extensive gateways for flow-through enabling links to be established between different operators

HITACHI'S STRATEGIES FOR ITS TELECOM MANAGEMENT SYSTEM

As shown in Fig. 2, Hitachi is constructing a competitive telecom management system based on the following five system strategies.

Infrastructure System Strategy

The infrastructure system shown in Fig. 3 is considered indispensable to the construction of an extendible business system. This infrastructure system provides an open and highly reliable distributed processing platform conforming to CORBA specifications. It allows existing systems consisting of mainframes to be integrated using object-wrapper technology, and also provides work management to enable different departments to interact in a flexible manner. The infrastructure system also provides databases to virtually integrate customer, equipment, and billing databases and to form a data warehouse to support policy-based data updating and management/business activities. Information access with respect to the virtual database will not be dependent on a platform using Internet servers and directory servers.

Customer Management/Billing Systems Strategy

Customer management will be performed for various customer states including prospective and canceled customers by tabulating and utilizing individual billing information. Dynamic credit management will be achieved by matching external information with internal information like usage and payment patterns. A mechanism will also be provided to meet customer needs in a flexible manner with respect to billing time, billing period, statement format, and payment method. Finally, comprehensive analyses of correlations between customer usage patterns and payment plans, discount services, etc., will be performed to determine customer characteristics and to respond more effectively to customer inclinations.

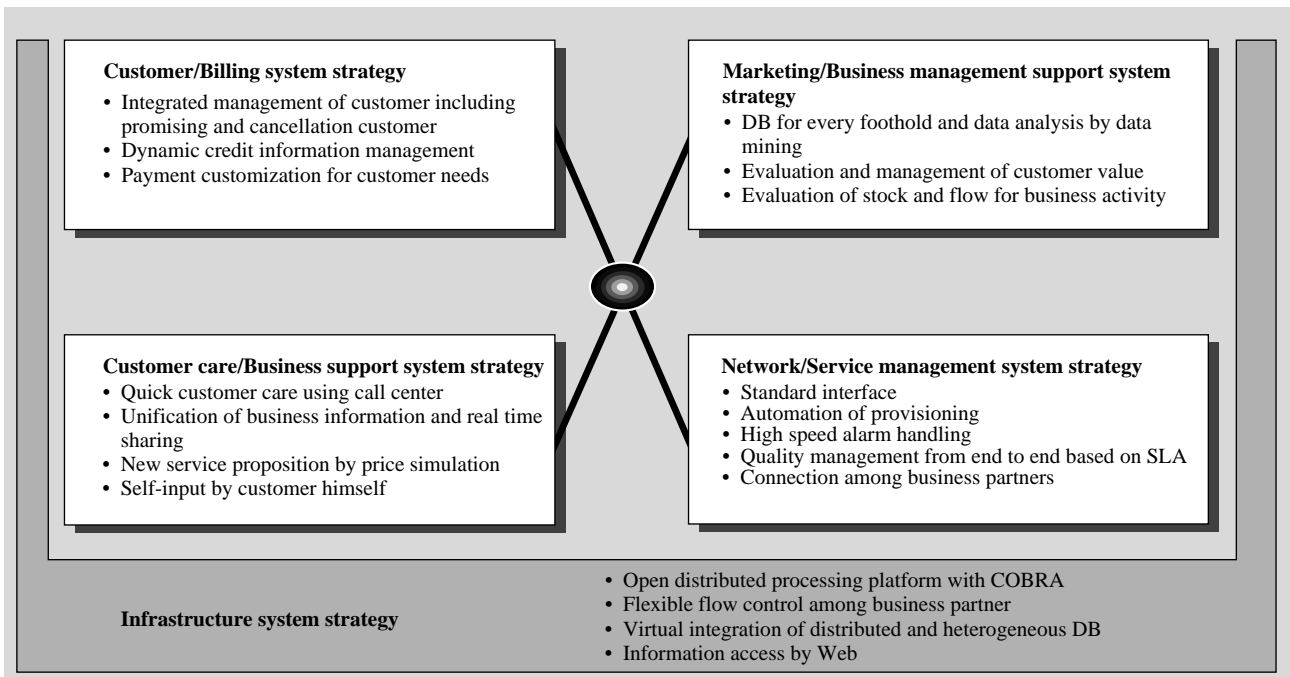


Fig. 2—Hitachi's Concept and Outline of Telecom Management System Strategy.

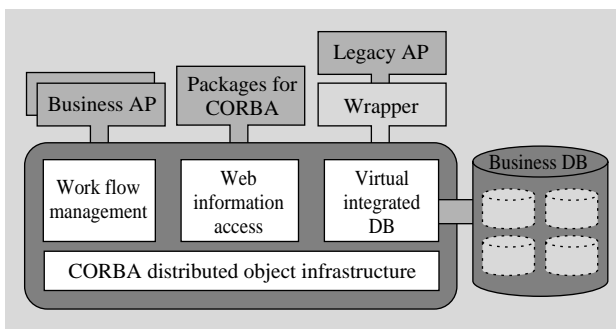


Fig. 3—Structure of Infrastructure System.

Customer-Care/Business Support Systems Strategy

New customers will be energetically recruited through effective proposals and sales activities based on a solid understanding of customer needs. Business and technical information for handling customer inquiries, moreover, will be managed on a uniform basis. An “escalation function” will also be provided so that a customer inquiry that cannot be handled by primary customer reception will be immediately taken care of by secondary reception in order to achieve quick response to customer. Business support will be enhanced by providing a charge simulation function that can be used when adding new services. Furthermore, to create more business opportunities without being restricted to time and place, self-input

functions will be employed to expand the means of customer reception and to make it available 24 hours.

Marketing/Management Support Systems Strategy

Giving special consideration to new and relevant data, information will be distributed and stored so that each business base can construct a data warehouse and perform “data mining” as needed. Moreover, by distributing data between such data warehouses and business support systems, customer information will become common data and processed in a uniform manner. Management strategy-making, analysis, and marketing will be made more effective by evaluating and managing the returns on each customer, by introducing stock evaluation and flow evaluation with respect to business activities, and by targeting promising customers for each business plan.

Network/Service Management Systems Strategy

Management systems for both transmission/switching networks and access networks are now being developed based on the international standards for network architecture described in the chapter “Technology Trends in Telecom Management.” These will eventually be integrated with a management system for the end-user network to achieve guaranteed end-to-end services. In the area of network configuration

management, complex network configurations will be understood and managed through object-oriented modeling, and automatic provisioning will be achieved by dynamic resource allocation. In fault management, reliable trouble-ticket processing will be achieved by quick fault isolation and work-flow management based on high-speed alarm handling. In performance management, accurate reporting of customer service quality will be provided based on service level agreements. Operation and management information will also be provided to users and mutual connections will be established between the management systems of different operators.

CONCLUSIONS

Telecom management systems support many tasks performed by telecom service providers. They can improve work efficiency and help achieve quick provision of low-cost services to customers. Considering that telecom management systems are in effect large-scale distributed information-processing systems, Hitachi aims to make a significant contribution to their development based on many years of developing information systems and extensive technical know-how.

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