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## Telecommunication Network Management

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**ABSTRACT:** The today's telecommunications sector is a crucial driver of economic and social productivity. The telecommunications sector not only contributes greatly to countries' economic activity, but also to the development of other sectors. Owing to the effect it has had on their economies, developed countries have undergone big transformations in this field lately. The rapid growth of the telecoms industry over the last decade has largely influenced the booming and emerging economies of China and India. The goal of this review article is to examine by study of data from both Chinese and Indian telecoms industries the most influential factors influencing telecommunications development.

**KEYWORDS:** Distributed object technologies, Network management, Telecommunication network management, Web based technologies.

### I. INTRODUCTION

The management of telecommunications networks emerged in International Telecommunication Union - Telecommunications (ITU-T), a strategic objective of defining or recognizing common interfaces that require a network to manage uniformly across network providers.. Telecommunications network management is a strategic purpose[1]. The procedure has helped to facilitate a standard approach for identifying and solving network problems. This is often used and handled by cable and cellular TV networks. Network administration has been used extensively for handling networks ranging from fiber optic high-speed to cellular and satellite wireless communications. Management is very intimidating at this size, so network management has to break down activities and resources so that the infrastructure is better handled[2].

TNM as a model for network management comes in two main forms, Simple Network Management Protocols (SNMP) and Common Management Information Protocol (CMIP). The two systems are vastly different. The CMIP approach provides a feature-rich set of sophisticated services[3]. The SNMP is based on a simplified interface in which specialized control services are delivered either by external network networks or the management system. SNMP is connected and has a minimized overhead, making it the main method for the handling of inbound data flow. The constraints are that it is important to micro-manage the SNMP mechanism to keep the process running and to eliminate device errors that can be inserted into the substructure of the networks[4].

CMIP loses the simpler approach of supporting more complex network agent services. It is suitable for dynamic and complex machine sequences conducting concurrently multiple main tasks. Their downside is that the volume of data flow is longer, lengthier, and can become very difficult to manage when it is greater than at any other point in the process. In order to provide service providers with several networks, ITU-T recommended this system for network management[5]. The design follows a layer of various roles levels.

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## II.LITERATURE REVIEW

### *1. A foundation of Network Management:*

The Telecommunication Management Network (TMN) is a framework established based on the OSI Reference Model, and has become a prominent reference framework for network and system management. A variety of basic principles for network management are implemented in the OSI reference model. A programme is a network management system. The goal is to evaluate, track, and control the architecture of networks and facilities in order to ensure their proper setup, robustness, efficiency and protection[6]. Two types of entities in this structure are described by the OSI model, namely the manager and agent. The agents are network resource representatives or end systems managed. They have management information for the network administrators and managers follow the agents and decide appropriately on management and power. The management intelligence is placed exclusively on network administrators in such a model. This is the primary programming paradigm at the moment. If the design of distributed systems advances and peer-to-peer systems become more prevalent, the role of managers and agents is increasingly being spread by networks. Their role is becoming less distinct. It use the words manager and agent more generally today, however, because tasks are used for designing the functions of a particular entity, rather than relating in general to that entity[4].

In the OSI comparison model the terms management unit and managed object are clearly separated. A managed organization is a managed assets or end system. It's an optical switch, a modem or web server, a physical representation. The object controlled corresponds to the entity's knowledge view. It offers information on management and the management skills of the managed organization. For example, as part of their management details, a router may have processing speed, buffer size, and number of I/O interfaces and the collection of configurable configurations as part of its management ability. This adds to a biased viewpoint on what is functionally present and what is manageable by a regulated organization[7].

With regard to the varied variety of tools and devices available today in networks and systems, it is immediately clear that some kind of standard models of information are required for the reliable presentation of this information and for the delivery of managers' management information to be a common communication medium. In reality, a management framework is specified by the OSI reference model based on three aspects: practical, communicative and informative[8]. The management system information views describe the management data representation, the identity of the organization, the organized management information, the type of information available and the semantics related to such information. The communication vision of a management system describes how the management information is conveyed through a communication channel. A secure end-to-end communication protocol like TCP/IP is usually expected. In addition, a protocol is intended to determine the management behavior a manager could require of managed entities and the notices or warnings the managed entities should implement. The OSI reference model describes five management functional areas: configuration, errors, performance, accounts, and protection. From the outset, the network management research activities have been coordinated by the five fields of management functions[9].

- Configuration: Resource configurations such as network path settings, system provisioning, system settings, etc. Configuration can also provide user terminal configuration, user profiling, and personalization of service in today's telecommunications networks.f

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- **Fault:** Fault detection, diagnosis, separation, rehabilitation, security of the road, etc. The immediate cause and effect of failure and service interruption is a widely respected field of study for fault management. When systems and services are widely shared and telecommunications networks are increasingly size and complicated, it is exceedingly difficult to detect and cope with network deficiencies effectively. To date, a great deal of study has been conducted on trajectory security and restores optical networks. *f*
- **Performance:** Concerns about the efficiency of network infrastructure service management, traffic tracking and traffic control. The transition toward a complete digital packet-switched system and the implementation of multimedia offerings in both wireless and wired networks attracted greater interest. *f*
- **Accounting:** Concerns about user traffic billing and accounting. This management field was not a significant subject of research into network management. Pricing and billing in networks, however, have a direct effect on how account management should be achieved. Furthermore, considering the fact that there is increasing availability as part of the telecommunications service offering of applications providers and premium services dependent on use (e.g., real time broadcasting), efficient accounting management is a must. *f*
- **Security:** Issues such as verification, approval, protection profiles, access management, encryption, etc. Although security monitoring is a significant field of network management, there has been relatively little focus in the past. This can be due to the closely controlled private network of the conventional telecommunication network isolated from the Internet of Packs. Threat protection has become the management challenge owing to the convergence of networking infrastructures and the increased intensity of security threats on networks and facilities.

The OSI model also specifies a supplementary management feature called "common." It consists of management features similar to all other management features. The reporting of incidents is viewed as a traditional position. The leading network management models in terms of structure, connectivity and knowledge. As the Telecommunications Network is a diverse network, service, customer and business infrastructure. The OSI model does not provide a top-down view of telecommunication network management. The Telecommunication Management Network (TMN) framework defines a layered logical architecture consisting of element management, network management, service management and business management[10]. The architecture of layered TMN is built according to the layered network concept. Any layer at the top draws on the underlying layer's functions and is known as a lower layer abstraction. In addition, the network control layers are known as vendor-independent.

- **Element management:** provides a view on the collection of network elements, usually forming a sub network. Also mediates data between the network element and the network manager. It is device and network technology specific. *f*
- **Network management:** provides end-to-end network view of the managed resources and devices. It is device neutral. *f*
- **Service management:** provides contacts with customers and service providers. Quality of service assurances, service orders, billing information and trouble ticketing. *f*
- **Business management:** product and human resource planning. Business level view of the services and financial concerns.

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## III. CONCLUSION

This paper provides an understanding of various structures of network and service management and their possible path to the new autonomy model. This analysis has also led to several key guidance or obstacles for different management systems. The study of traditional systems has shown that, on one hand, the continuing complexity growth and, on the other hand, technical advances in networking and services are a no longer effective management scheme, which requires a new variety of supporting technology. Different stack holders have created new frameworks focused on distributed paradigms and interoperable architectures for entity direction. However, such technology-enabling alternatives to many of the challenges associated with conventional management systems but still not without a workaround, as well as not satisfying the rising demands of a more flexible and autonomous management strategy.

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