Requirements for
TINA Platform
towards Information Sharing Business

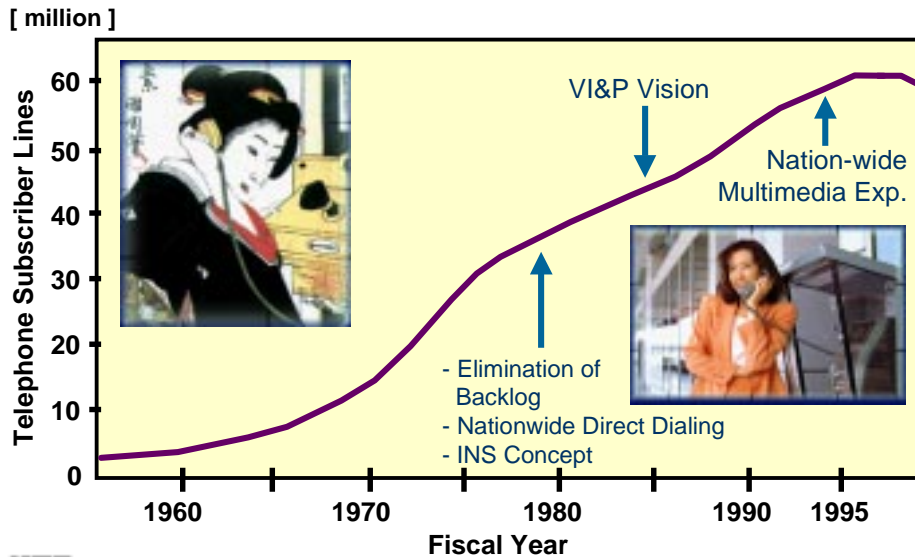## April 12 1999

KITAMI, Kenichi

NTT Information Sharing Laboratory Group

Long-term Trend of Telephone Business
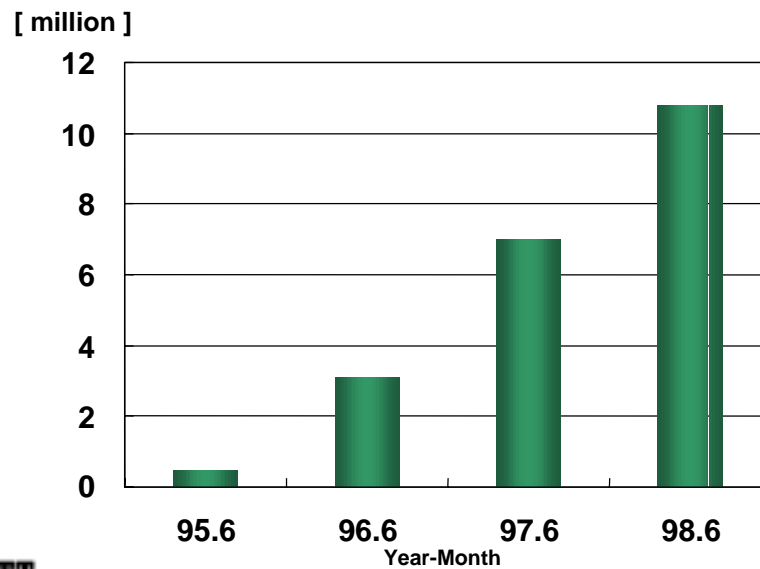
2

[million]

Telephone Subscriber Lines

VI&P Vision

Nation-wide
Multimedia Exp.

- Elimination of
Backlog
- Nationwide Direct Dialing
- INS Concept

60
50
40
30
20
10
0

1960   1970   1980   1990   1995

Fiscal Year

Mobile phone

3

[million]

```
45 ┤                                              ███
40 ┤                          Mobile phone users   ██
35 ┤                                          ███  ██
30 ┤                                          ███  ██
25 ┤                                     ███  ███  ██
20 ┤                                     ███  ███  ██
15 ┤                                     ███  ███  ██
10 ┤                          ███        ███  ███  ██
 5 ┤                     ███  ███        ███  ███  ██
 0 ┤  ·    ▪    ▪    ▪    ▪    ███   ███  ███  ███  ██
   89.3  90.3  91.3  92.3  93.3  94.3  95.3  96.3  97.3  98.3  98.12
```

Year-Month
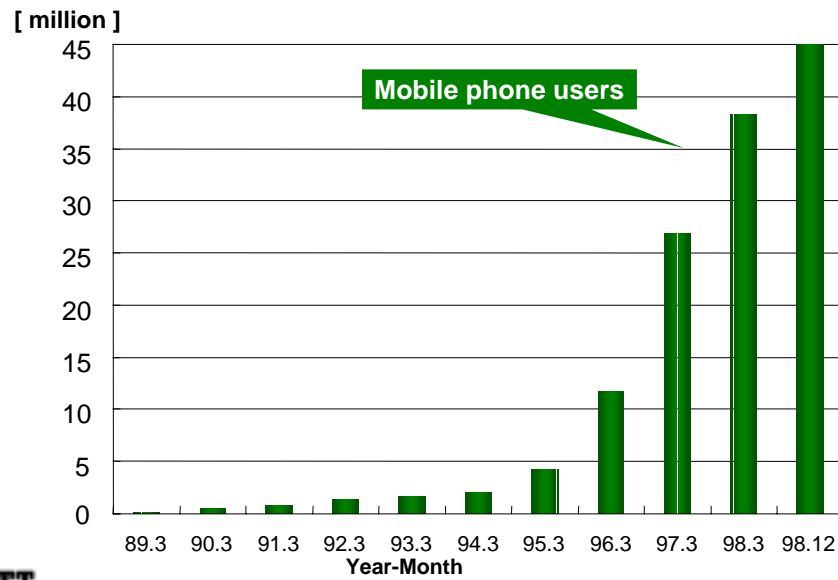
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Internet users

4

[million]

```
12 ┤
10 ┤                                   ███
 8 ┤                          ███      ███
 6 ┤                          ███      ███
 4 ┤                 ███      ███      ███
 2 ┤       ▪         ███      ███      ███
 0 ┤      ███        ███      ███      ███
      95.6      96.6      97.6      98.6
```

Year-Month

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GMN Architecture and Layered Services

GMN Architecture   **Layered Services**

Applications

Information Sharing Platform

Applications Platform — *Application platform service*

Authentication server   Session manager

Network Service Middleware — *Intelligent platform service*

Transport servers

Multi-Protocol Transport Middleware — *Multi-protocol transport service*

GMN Access & Core Network — *Basic transport service*

ONU   CS   ONU   CS

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Information sharing Platform

Customer
Service Provider
Network Carrier

Networking Platform

APIs

Components

Routing   Authentication/Security   Mobility

Call control

Plug & Play
Seamless Network and User software handling
Safe and Reliable network environment

Etc.

Access Control   Resource Mgmt   Directory   Accounting

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Emerging System Integration

Client Tier

Middleware Tier (Application Servers)

Existing System Tier

Browser
Java applet
Helper app.

PC app.
UNIX app.

DPE

IN

TMN

Information Base
(Use Info., Contents, ….)

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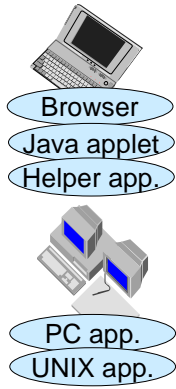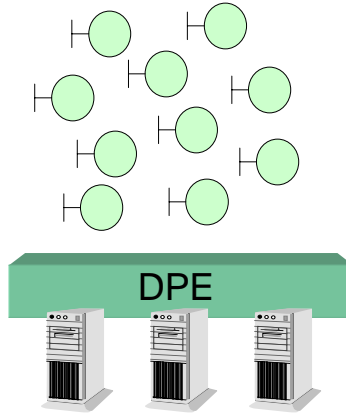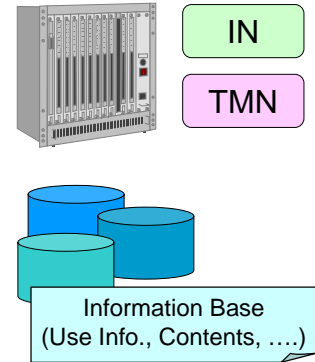
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TINA Business Model

Broker
（Directory etc.）

Consumer
TLA TCSM

Retailer
（Navigation etc）
SSM CSM

Service/Contents
Provider
TCSM TLA

Connectivity Provider
LNC CC CP

Distributed Processing Environment

Native Computing and Communications Environment

Hardware Resource

: TINA Components

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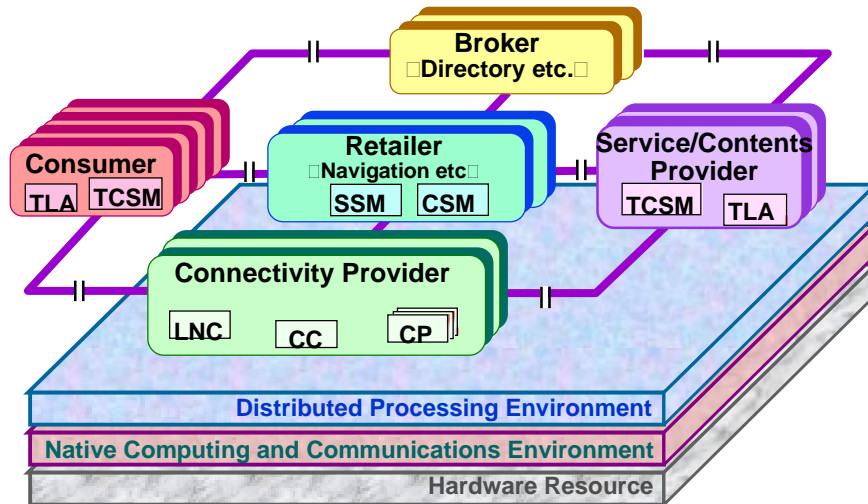
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Middleware in Enterprise Environment

Client Tier | **Middleware Tier (Application Servers)** | **Existing System Tier**

Consumer | **Retailer** | **Service/Content Provider**

WWW/Java

COM/CORBA

Wrapper

Connectivity Provider

CORBA/IN → IN

CORBA/TMN → TMN

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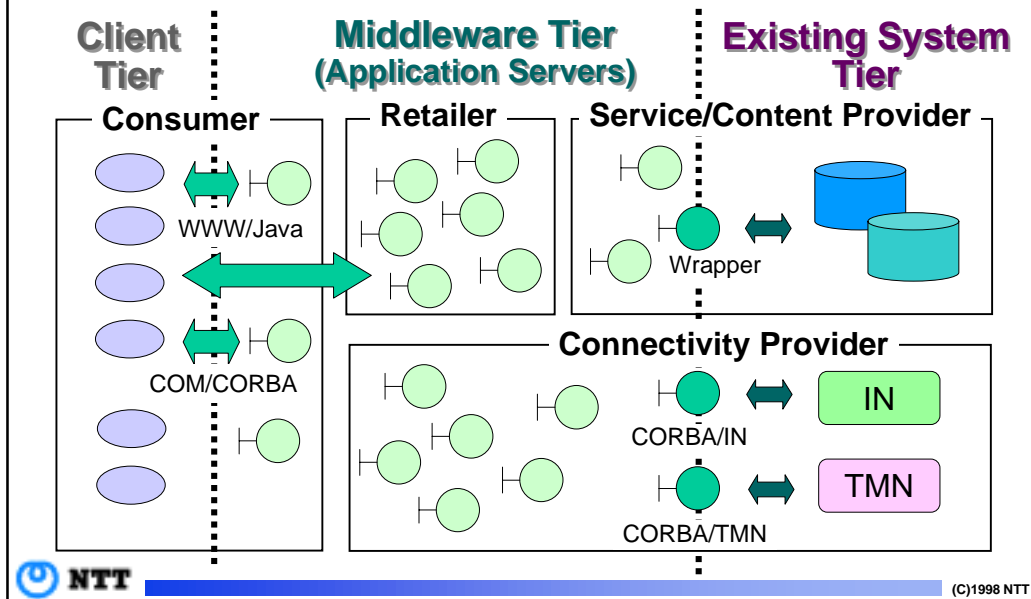
TINA-related activities in NTT

- **Ret interface standardization in OMG (in cooperation with Hitachi, GMD Fokus, DT)**
  - **to realize middleware tier for Telecom Bus.**

- **Networked Digital Library**
  - **to retail integrated View of existing Content databases**

- **IP management system**
  - **to integrate emerging Mgmt System with existing Mgmt systems keeping scalability**

- **DPE in Exchange system**
  - **to provide open Network Service Interfaces keeping Telecom-grade Availability**

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Requirements to DPE from Development related to Ret Interface

☐ **Functional:**

- ◆ **Support of Transactional characteristics in delivering User events to large-scale and distributed Customer Base**
- ◆ **Event Channels Manageability to provide flexibility for System Deployment**
- ◆ **Security services including secure communication, authentication, authorization, and access control**
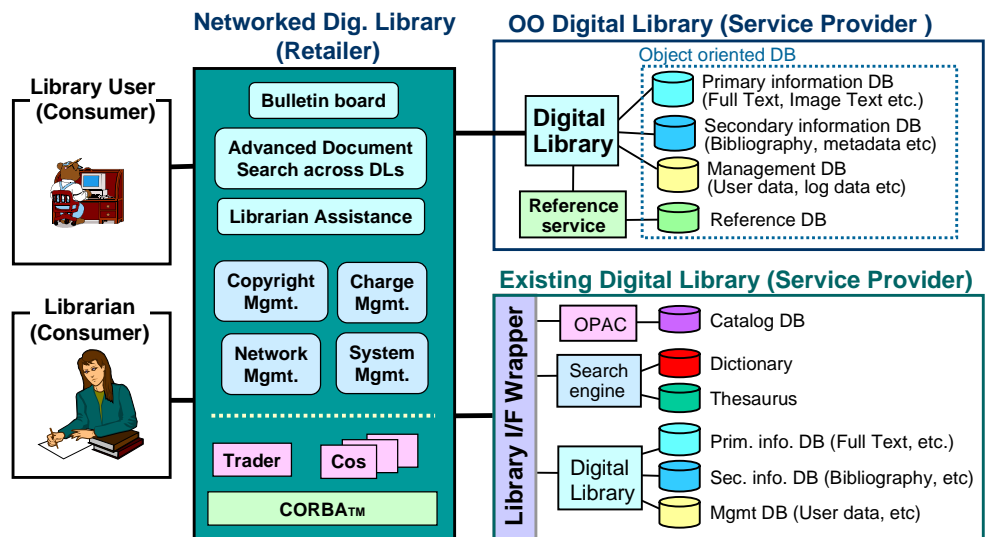
☐ **Non-functional:**

- ◆ **As of ordinary Information Systems**

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Networked Digital Libraries: - NetLibra -

Networked Dig. Library (Retailer)

OO Digital Library (Service Provider)

Library User (Consumer)

Librarian (Consumer)

Bulletin board

Advanced Document Search across DLs

Librarian Assistance

Copyright Mgmt.   Charge Mgmt.

Network Mgmt.   System Mgmt.

Trader   Cos

CORBA™

Object oriented DB

Digital Library

Reference service

Primary information DB (Full Text, Image Text etc.)

Secondary information DB (Bibliography, metadata etc)

Management DB (User data, log data etc)

Reference DB

Existing Digital Library (Service Provider)

Library I/F Wrapper

OPAC

Search engine

Digital Library

Catalog DB

Dictionary

Thesaurus

Prim. info. DB (Full Text, etc.)

Sec. info. DB (Bibliography, etc)

Mgmt DB (User data, etc)

OPAC: Online Public Access Catalog

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Requirements to DPE from Networked Digital Library

□ **Functional:**

- ◆ **Security, in particular interoperable Solutions across multiple Domains**
- ◆ **Information Base Integration with standardized manner,**
  e.g., Query and Meta-data mgmt.
- ◆ **Intelligent and reliable Resource Locator for the Federation among heterogeneous and distributed Digital Libraries**

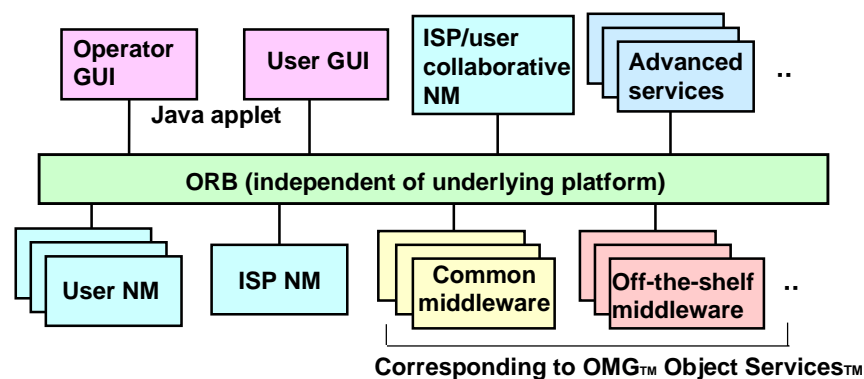□ **Non-functional:**

- ◆ **High availability**

IP Network Mgmt system
- MOAI -

(Multi-layered Operations system for Advanced IP networks)

System configured with set of independent software modules

| Operator GUI | User GUI | ISP/user collaborative NM | Advanced services | .. |

Java applet

ORB (independent of underlying platform)

| User NM | ISP NM | Common middleware | Off-the-shelf middleware | .. |

Corresponding to OMG™ Object Services™

This project is tightly coupled with OMG™ activities

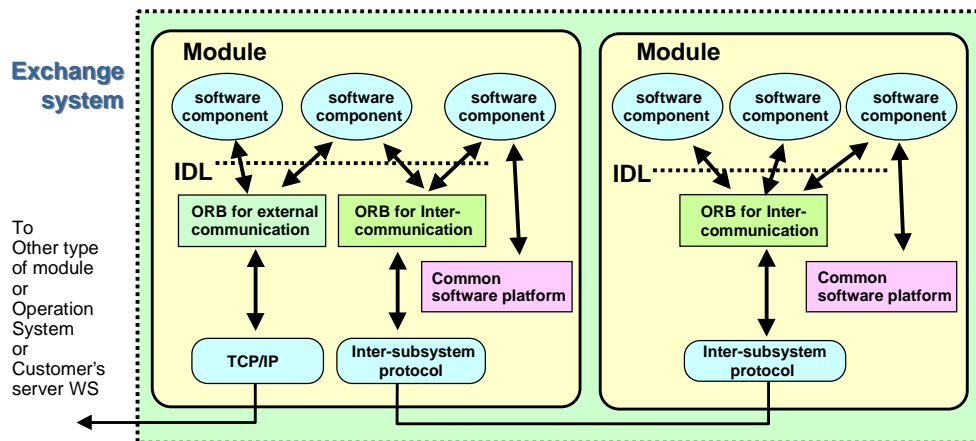# Requirements to DPE from IP Network Management system

☐ **Functional:**
  - ◆ **Reliable and manageable notification service**
  - ◆ **Sophisticated Supports for Integrating Network Resource Information and Computational Design**

☐ **Performance**
  - ◆ **High availability, possibly fault tolerant as well**
  - ◆ **Scalability in ORB and other related Object Services and Domain Interface, especially in geographically-distributed Subsystems**

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RT DPE for Exchange system

ORB for external communication
- Full interoperability
(OMG CORBA Ver 2.2)

ORB for internal communication
- High performance adjustment
- Relaxed interoperability

Exchange system

To Other type of module or Operation System or Customer's server WS

Module

software component | software component | software component

IDL

ORB for external communication | **ORB for Inter-communication**

Common software platform

TCP/IP | **Inter-subsystem protocol**

Module

software component | software component | software component

IDL

ORB for Inter-communication

Common software platform

Inter-subsystem protocol

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Requirements to DPE from RT DPE for Exchange system

- **Non-functional:**
  - ◆ **High performance: optimized implementation for multi-processor telecom node**
  - ◆ **The same grade of availability and reliability as telecom service system, e.g., IN**
- **Functional:**
  - ◆ **Flexibility for service system evolution and customization**

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Conclusion

- **Telecom Business is evolving towards Information Sharing**
- **Breakdown of TINA models to practical System Designing is needed**
- **Several Areas of Works are ongoing**
- **DPE plays key role for Telecom Business in deploying new Business in Flexible and Scalable manner**

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