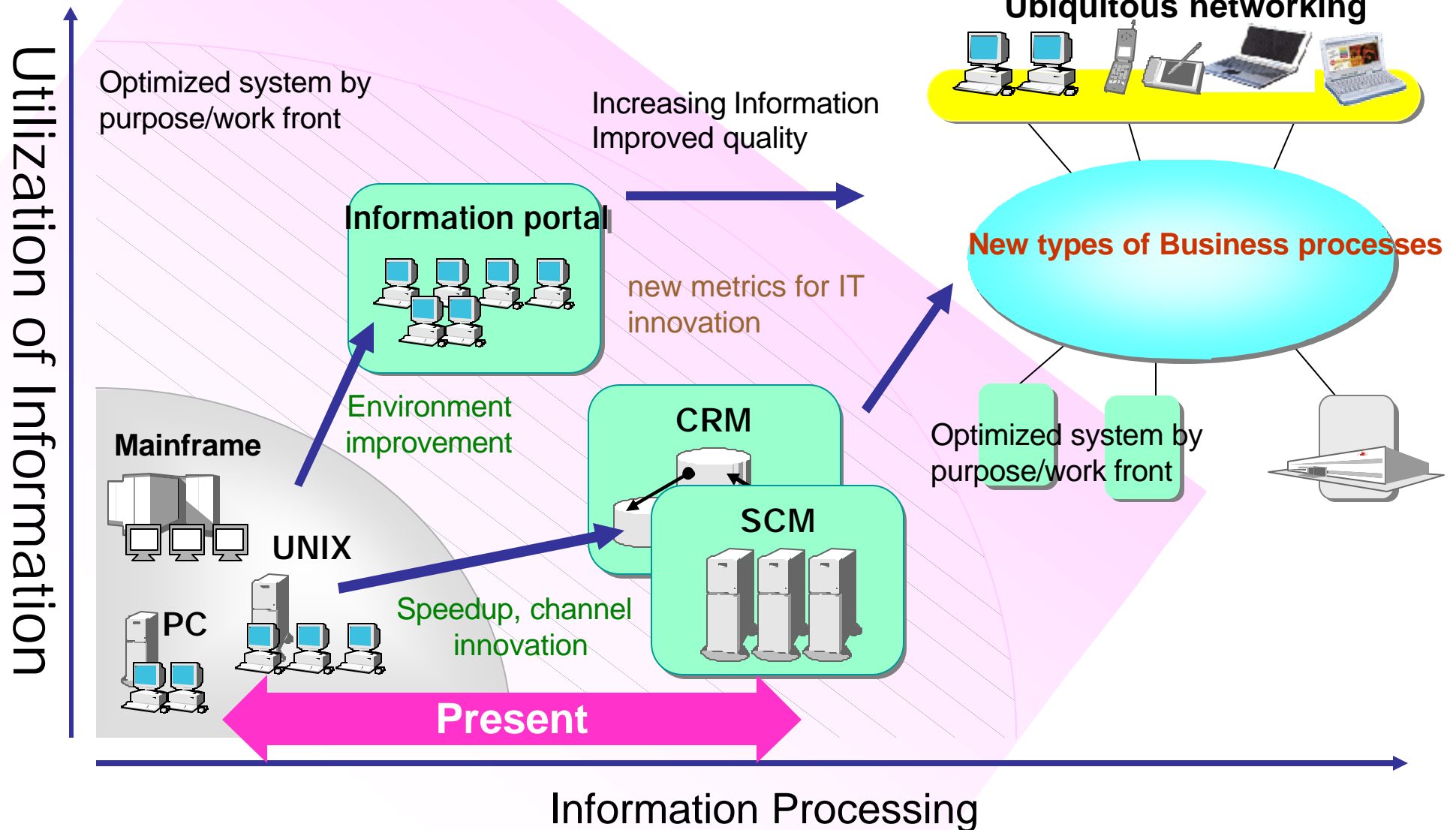# TRIOLE
~ Fujitsu IT Infrastructure~

October 2003

Kazuo Hajikano

FUJITSU Limited

Current trend of Information Systems

~ Fusion of systems optimized individually~

Ubiquitous networking

Optimized system by purpose/work front

Increasing Information Improved quality

Information portal

new metrics for IT innovation

New types of Business processes

Environment improvement

Mainframe

CRM

Optimized system by purpose/work front

UNIX

SCM

PC

Speedup, channel innovation

Present

Utilization of Information

Information Processing

Customer expectations toward IT system

❑ Services oriented integration (people, process, information)
In B and B to B creates a new value.

❑ System development with good use of existing IT asset
(Not forklift replacement, but extension and incremental addition)

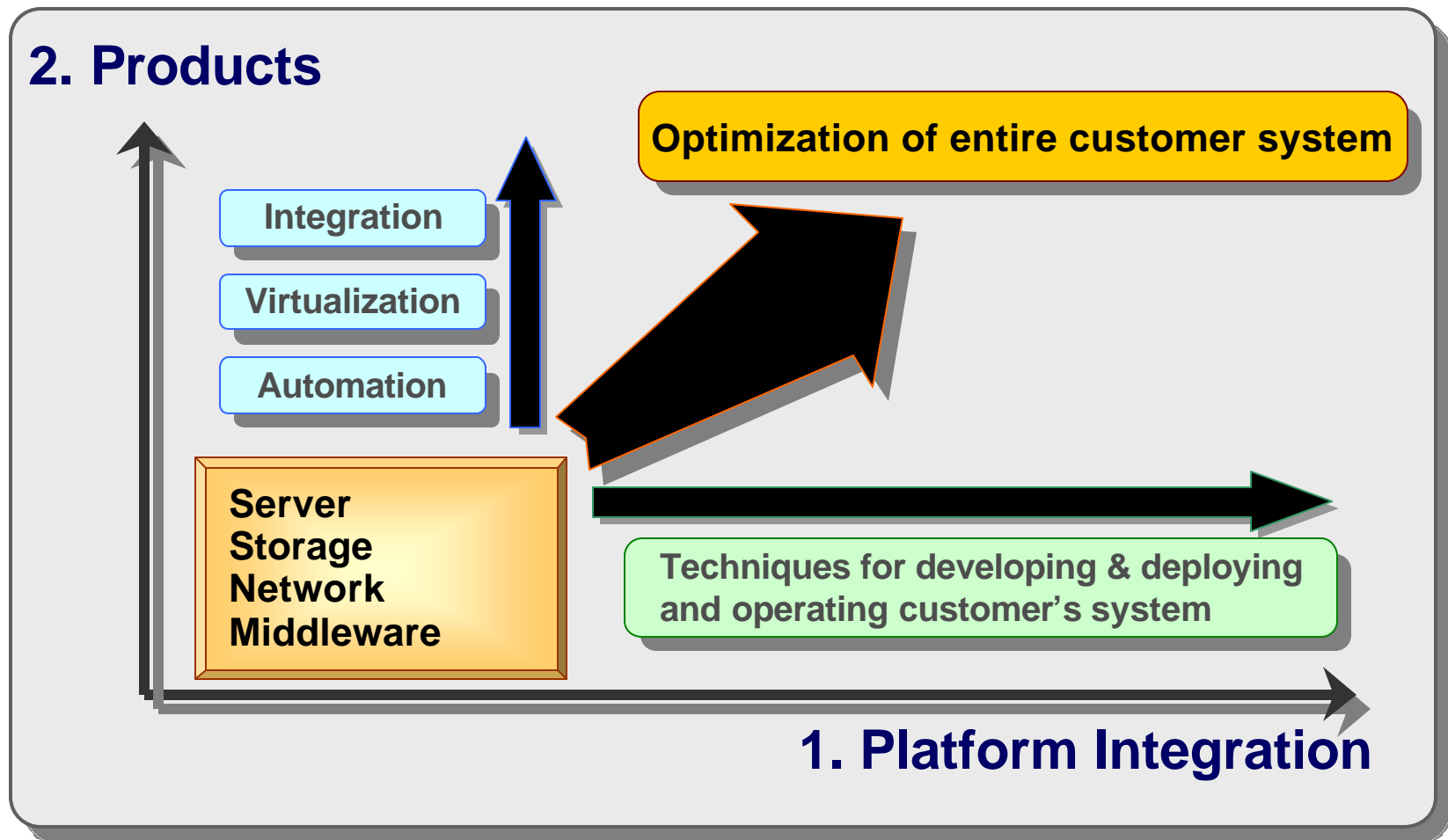❑ Rapid system expansion along with business growth

❑ Reduction of operation costs

TRIOLE

Business Agility

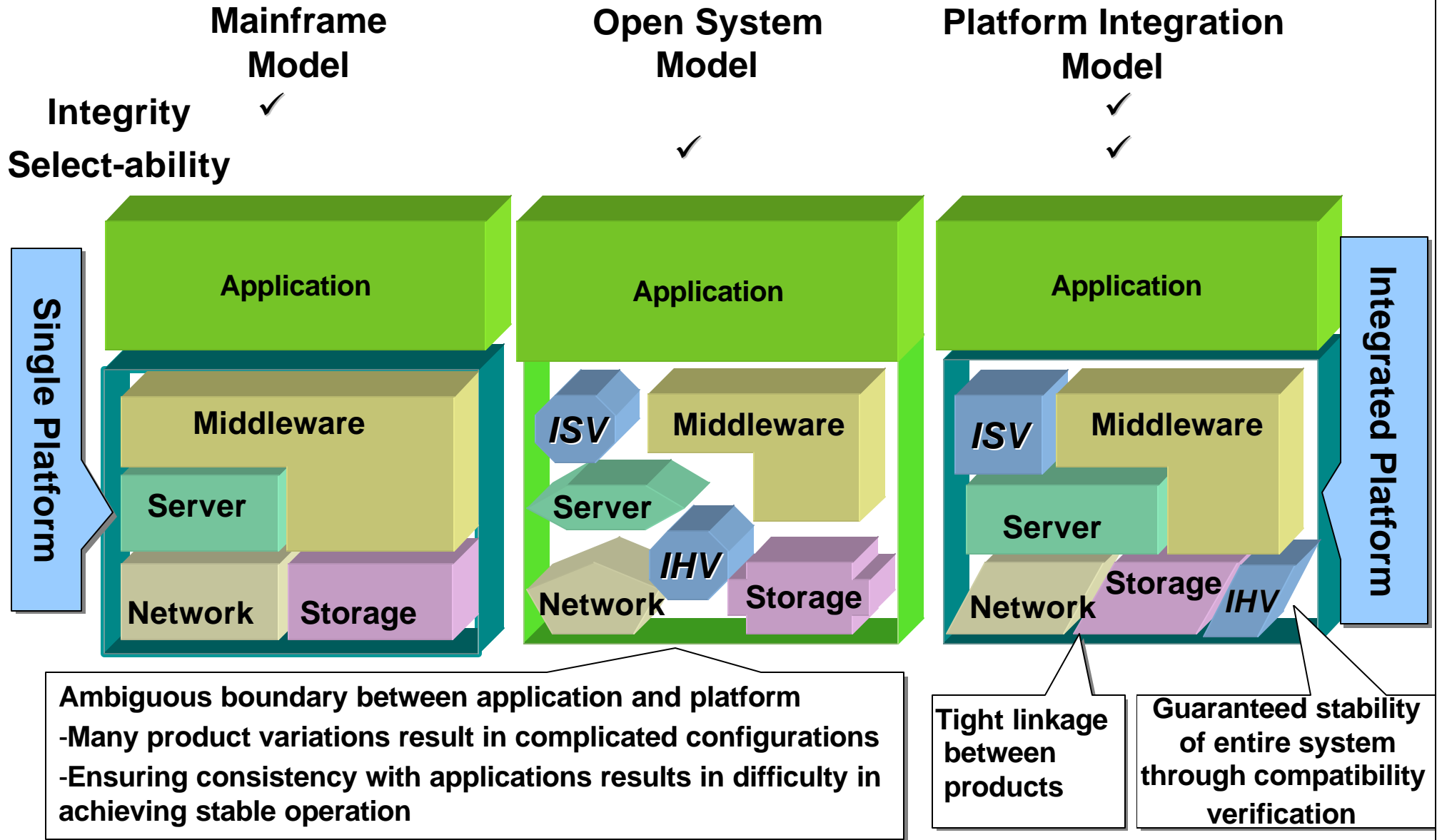Rapid development & deployment of business applications

Stable & reliable systems and reduced TCO

Evolution toward a new IT infrastructure

2. Products

Optimization of entire customer system

Integration

Virtualization

Automation

**Server
Storage
Network
Middleware**

Techniques for developing & deploying
and operating customer's system

1. Platform Integration

Integrated Platform

Mainframe Model

Open System Model

Platform Integration Model

Integrity ✓ ✓

Select-ability ✓ ✓

Single Platform → | Application | Application | Application |

Middleware

Server

Network   Storage

ISV   Middleware

Server

IHV

Network   Storage

ISV   Middleware

Server

Network   Storage   IHV

← **Integrated Platform**

Ambiguous boundary between application and platform
-Many product variations result in complicated configurations
-Ensuring consistency with applications results in difficulty in achieving stable operation

Tight linkage between products

Guaranteed stability of entire system through compatibility verification

 # ISV: Independent software vendor   IHV: Independent hardware vendor
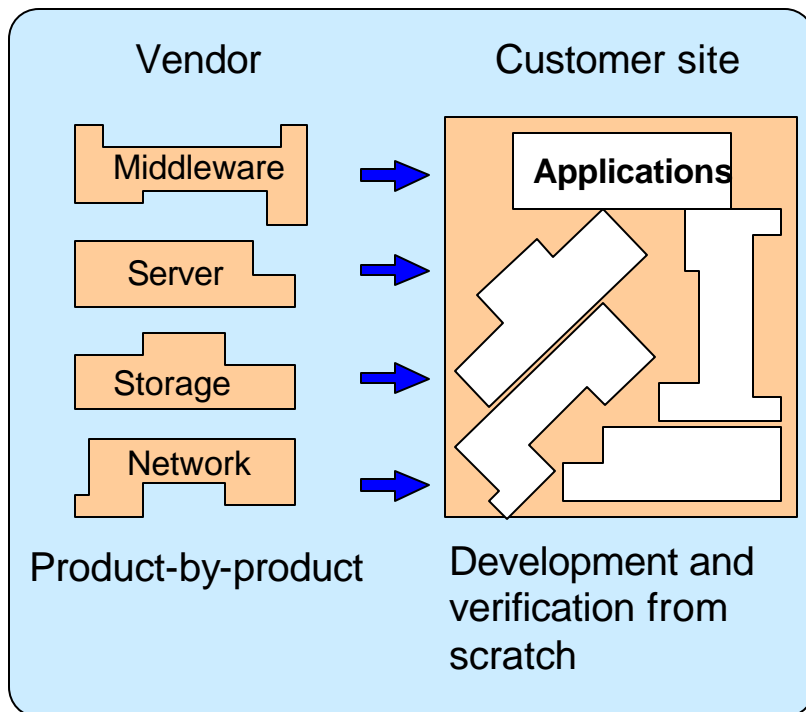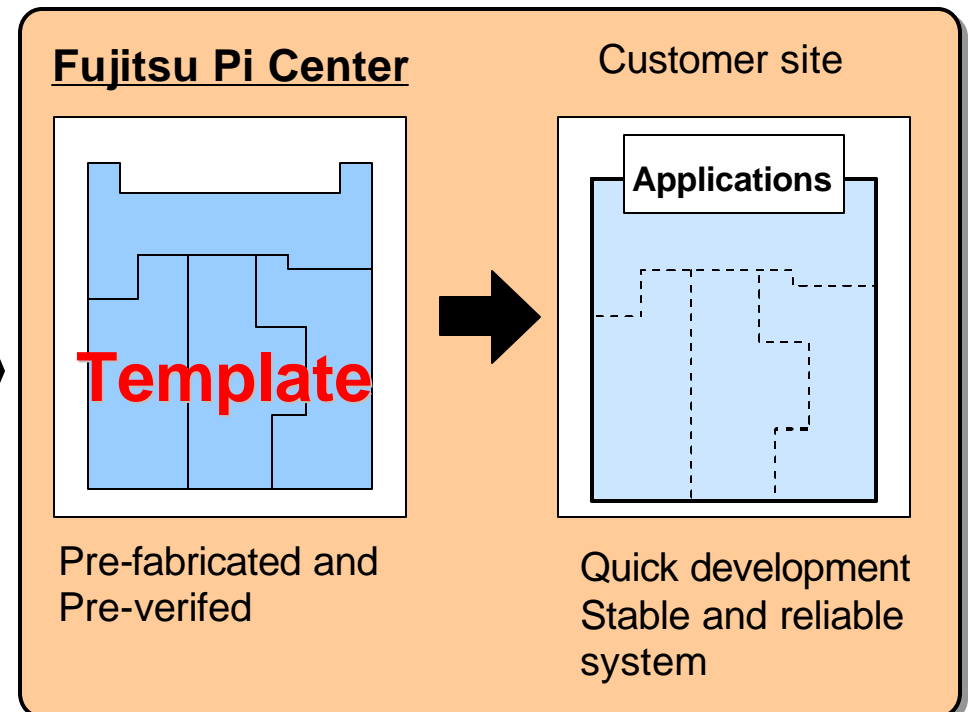
Model of Platform Integration

Platform Integration

☐ **Customer requirements: Quick development of high-quality & robust platform**
☐ **TRIOLE's approach: Patterned, building blocks and fabrication**

Existing method

Vendor   Customer site

Middleware → Applications

Server →

Storage →

Network →

Product-by-product   Development and verification from scratch

TRIOLE's method

Fujitsu Pi Center   Customer site

Template   Applications

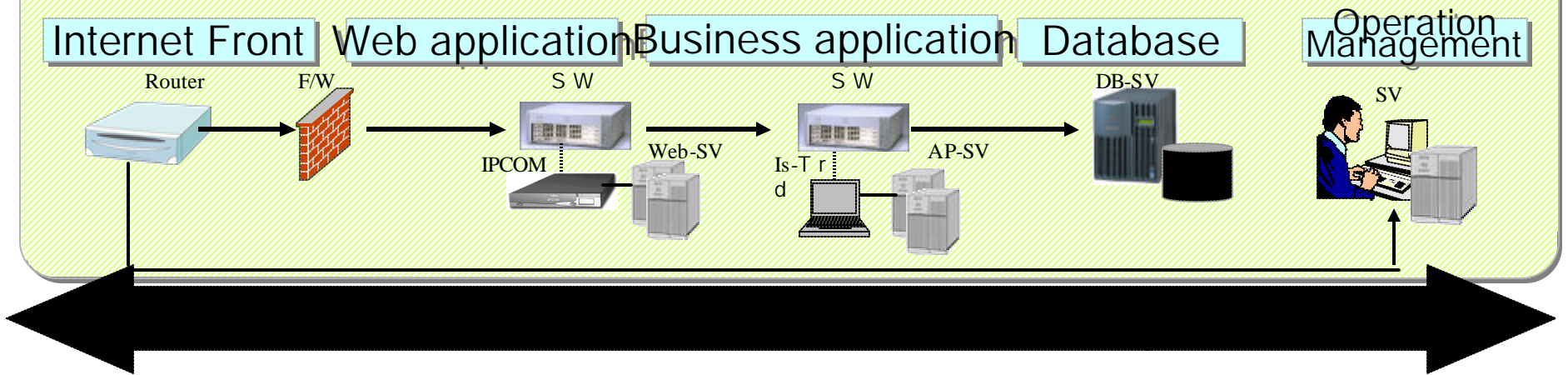Pre-fabricated and Pre-verifed   Quick development Stable and reliable system

Pi-Template

Integrate other vendor's products
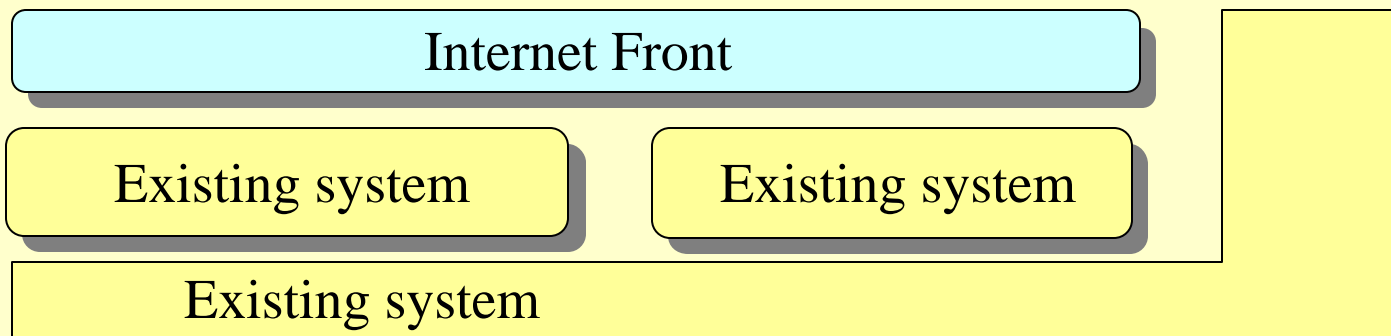(Microsoft? Sun? RedHat? ORACLE? BROCADE? Cisco? ???)

Basic Pi Template: System is divided into basic functional blocks

Internet Front	Web application	Business application	Database	Operation Management
Router F/W	S W	S W	DB-SV	SV
IPCOM	Web-SV	Is-T r d	AP-SV	

Hi-quality system can be constructed with the building block development

Example: Add-in to the legacy system

Internet Front

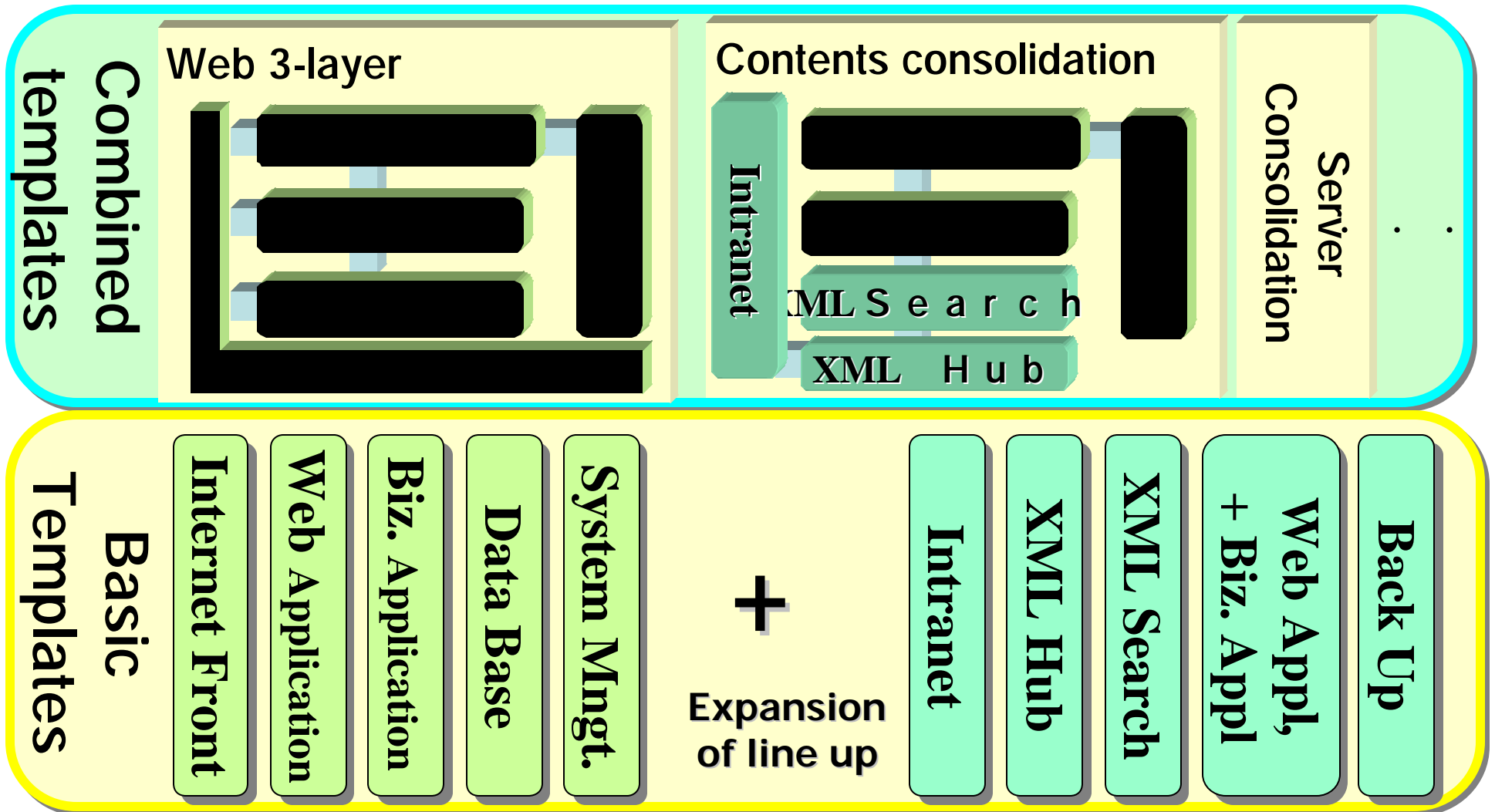Existing system   Existing system

Existing system

Pi : Platform Integration

Pi-Template Deployment

□ Expand line-up of templates based on analysis of the customer's needs and provide the combined templates suitable for different purposes
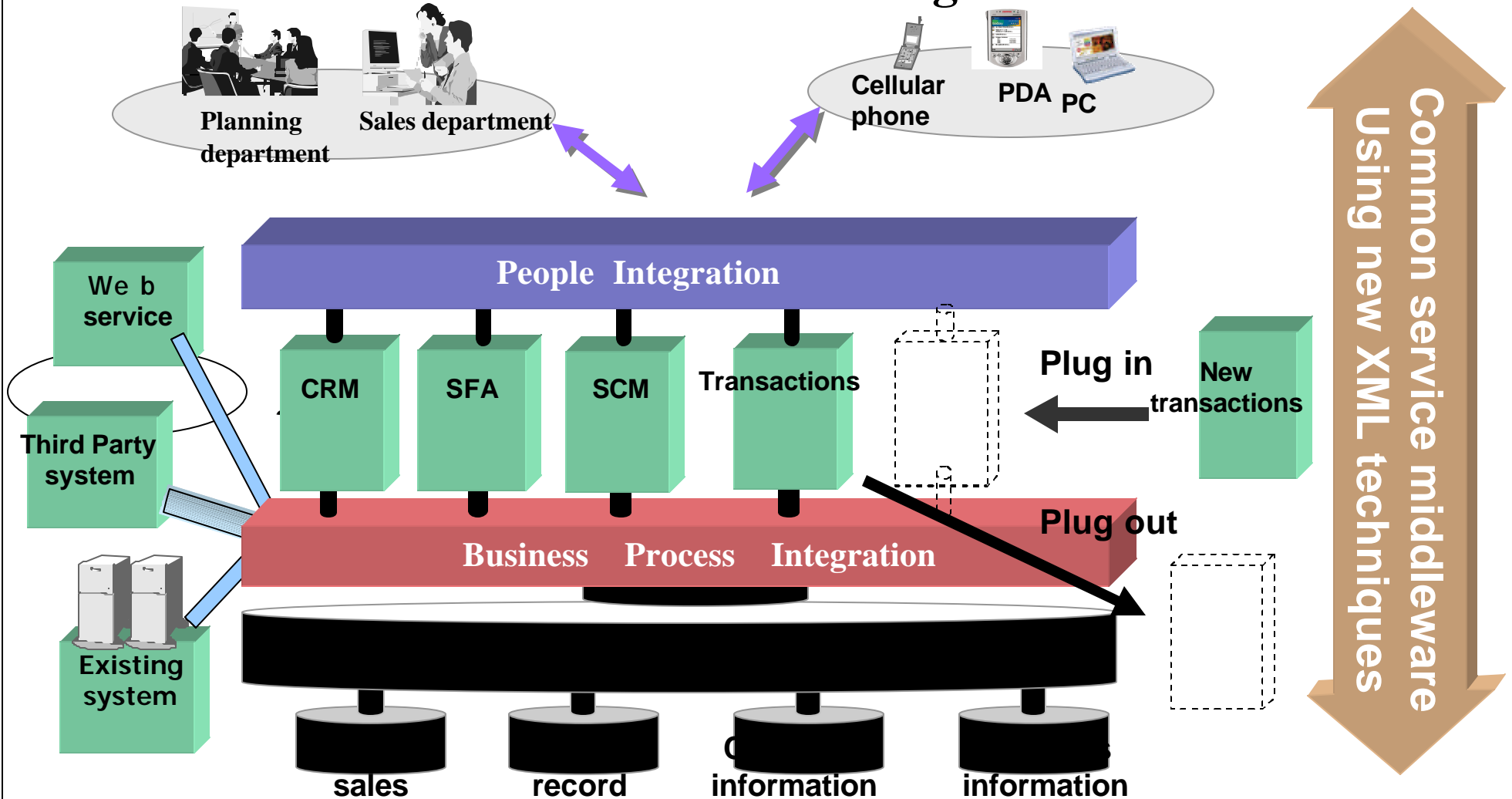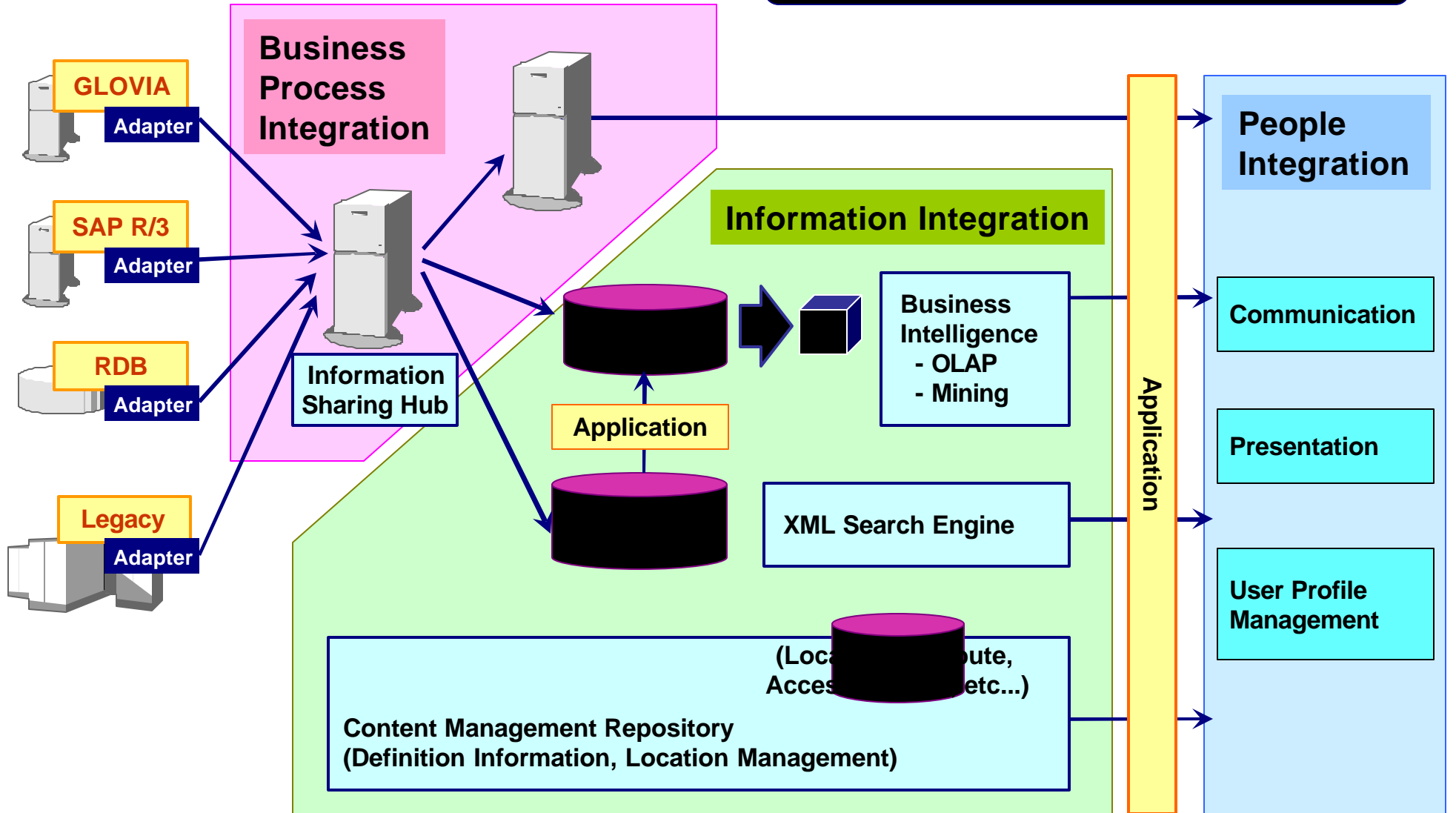
Combined templates

Web 3-layer

Contents consolidation

Intranet

XML Search

XML Hub

Server Consolidation

· ·

Basic Templates

Internet Front

Web Application

Biz. Application

Data Base

System Mngt.

+

Expansion of line up

Intranet

XML Hub

XML Search

Web Appl. + Biz. Appl

Back Up

Enhancement of the Basic Products

Toward "Business Agility"

Service-oriented Integration

Planning department

Sales department

Cellular phone

PDA

PC

People Integration

We b service

Third Party system

Existing system

CRM

SFA

SCM

Transactions

Plug in

New transactions

Business Process Integration

Plug out

sales

record

information

information

Common service middleware
Using new XML techniques

Service Oriented Integration

Business Process Integration

GLOVIA — Adapter

SAP R/3 — Adapter

RDB — Adapter

Legacy — Adapter

Information Sharing Hub

Information Integration

Application

Business Intelligence
- OLAP
- Mining

XML Search Engine

(Loca... ...ute, Acces... ...etc...)

Content Management Repository
(Definition Information, Location Management)

Application

People Integration

Communication

Presentation

User Profile Management

High Speed XML Data Search

Thousands of institutions have individual data formats.
-> difficult to search
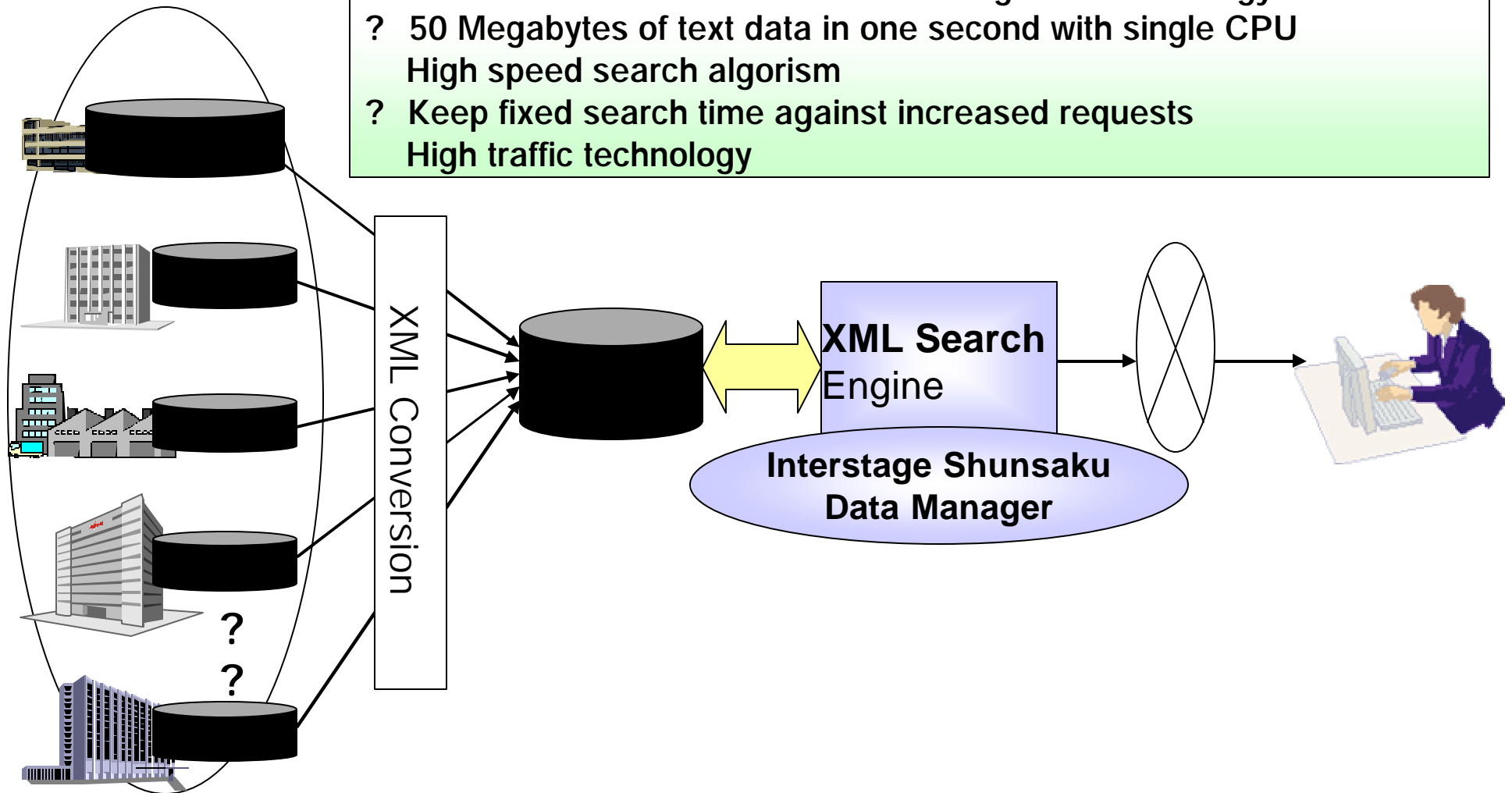Required search for different mixed databases
? Flexible and consolidated search using XML technology
? 50 Megabytes of text data in one second with single CPU
High speed search algorism
? Keep fixed search time against increased requests
High traffic technology

XML Conversion

XML Search Engine

Interstage Shunsaku Data Manager

? ?

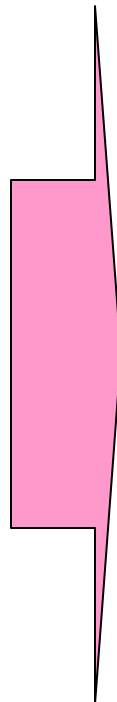# Toward "Stable Operation and TCO Reduction for the System"

Mission

Approach

24 ×7
Stable Operation

Establishment of Quality Chain

TCO Reduction

Autonomous System Infrastructure
(optimization of resource utilization)

Quality chain from component level to system level

■ Feedback of customer requirements

System level ⇨ **Non-stop business**
- Management of entire system
- Optimization of system resources

Products level ⇨ **Non-stop products**
- Cluster system
- Redundancy of storage/network
- Online expansion

Equipment level ⇨ **High-reliable equipment**
- Redundancy of components
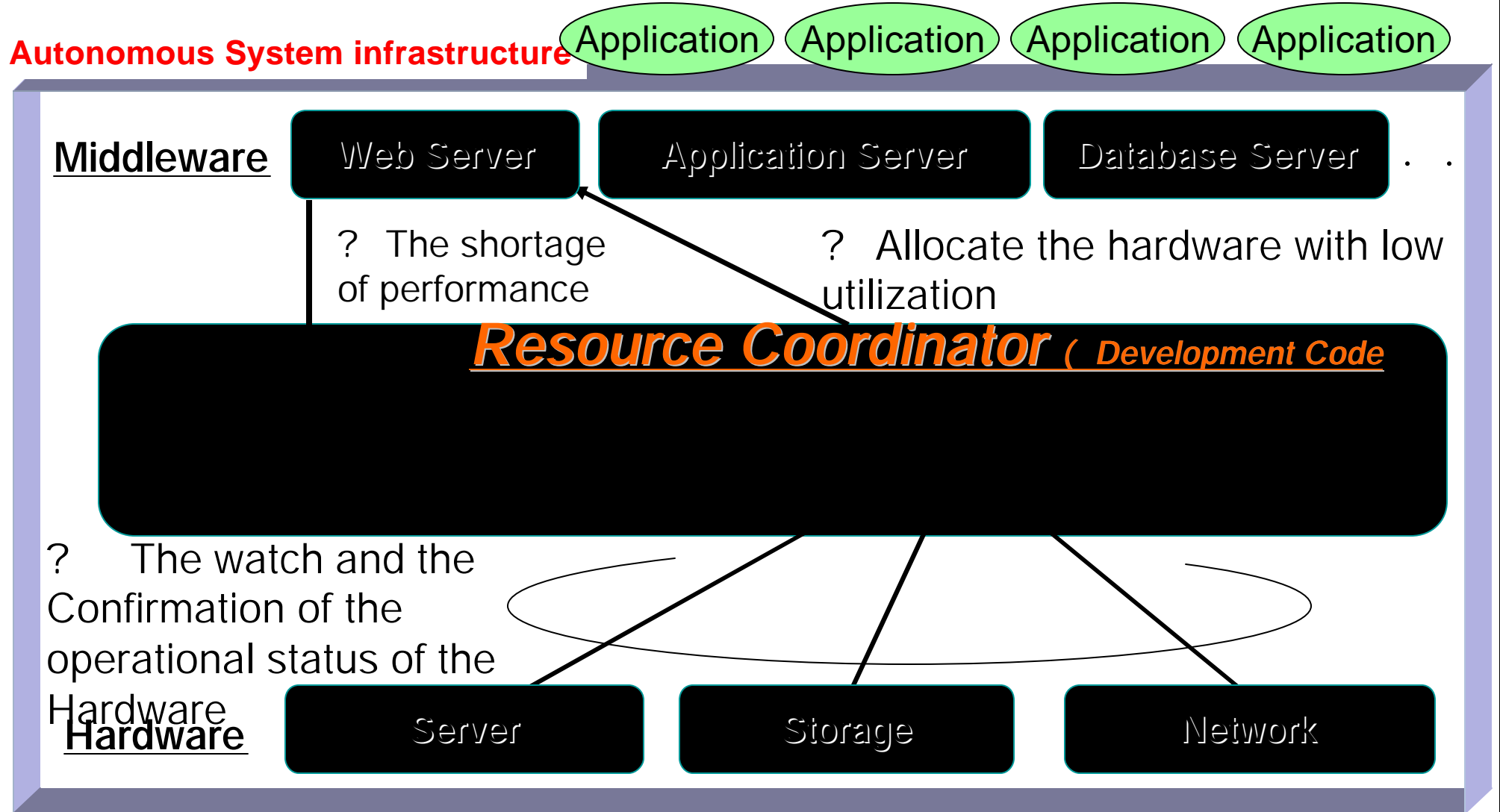- Hot-swap

Parts level ⇨ **Guarantee of data integrity**
- Adoption of high-reliability design parts
- Environmental/life tests

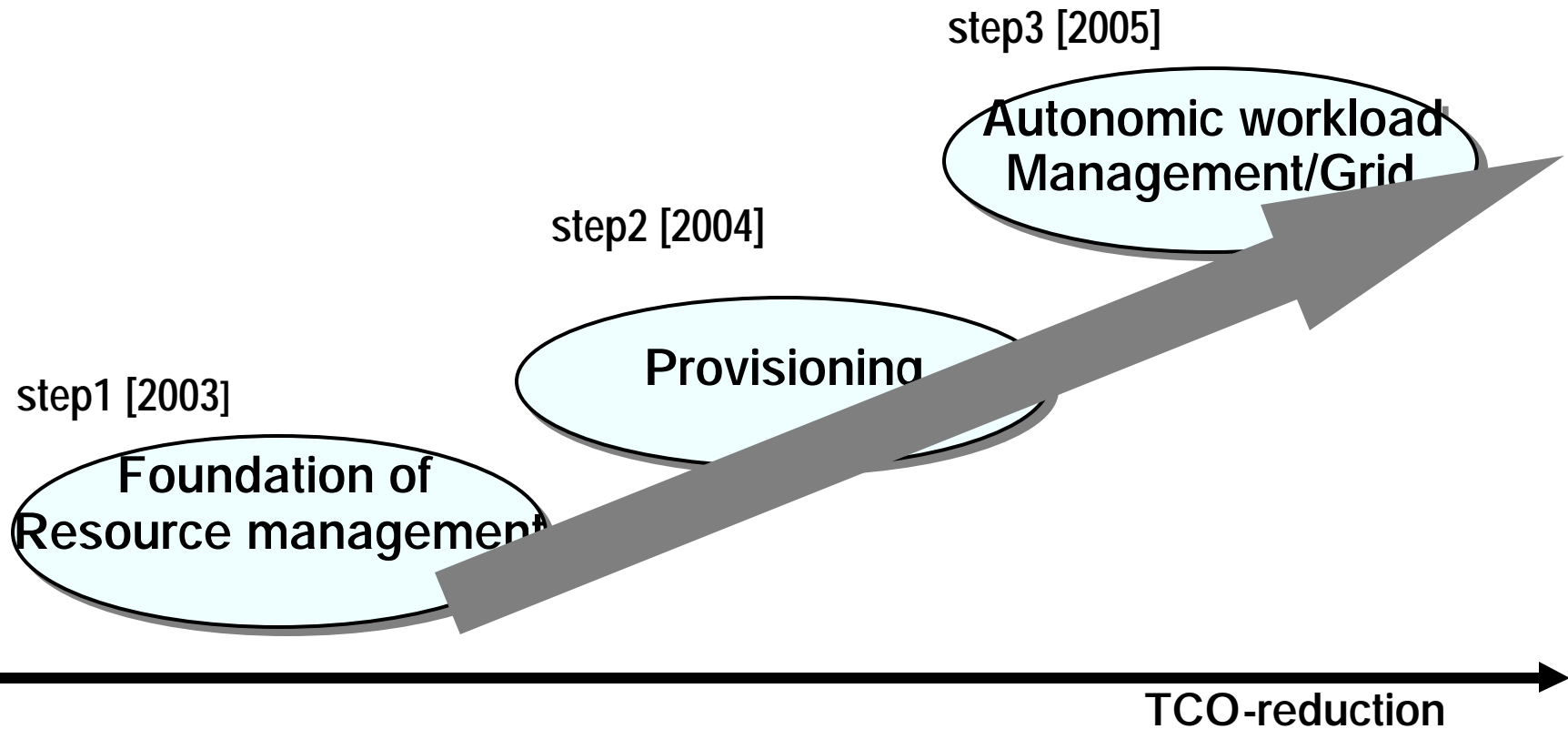■Accumulation of reliability

The Autonomous Systems Infrastructure
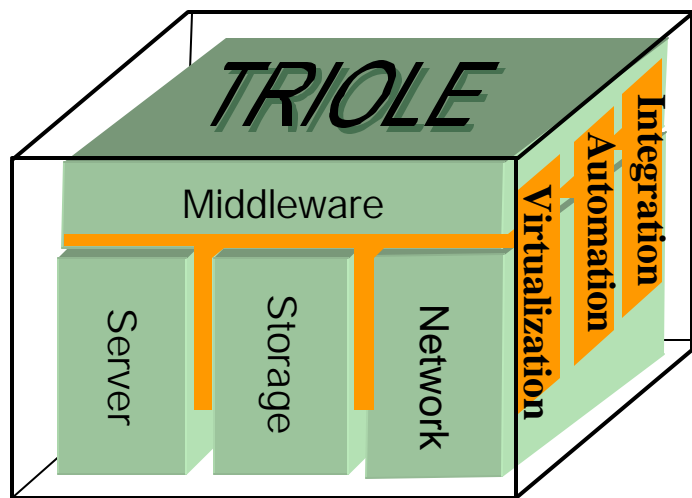
(Optimization of resource utilization)

Autonomous System infrastructure

Application   Application   Application   Application

Middleware   Web Server   Application Server   Database Server   . .

? The shortage of performance

? Allocate the hardware with low utilization

Resource Coordinator (*Development Code*

? The watch and the Confirmation of the operational status of the Hardware

Hardware   Server   Storage   Network

Road Map of Autonomous Systems Infrastructure

Service level

step3 [2005]

Autonomic workload
Management/Grid

step2 [2004]

Provisioning

step1 [2003]

Foundation of
Resource management

TCO-reduction

TRIOLE

TRIOLE is a Fujitsu IT infrastructure vision that drives down costs by integrating existing technologies, improving business processes and designing for future expansion.

Fujitsu will optimize customer IT resources using the TRIOLE core technologies of automation, virtualization and integration.
TRIOLE assimilates server, storage, network and middleware products in a cohesive, stable system.