IEEE Guide for Developing User Organization Open System Environment (OSE) Profiles

Sponsor
Portable Applications Standards Committee
of the
IEEE Computer Society

Approved 8 December 1998
IEEE-SA Standards Board

Abstract: This guide presents an overview of User Organization Open System Environment (OSE) Profiles and their application. It is intended to assist users, planners, and implementers in developing User Organization OSE Profiles that address the operational requirements of the organization; related information technology services; and the standards, standards options, and interim solutions that will meet those requirements. The guide also includes conformance testing and transition planning considerations as well as examples of user organization OSE profiles.

Keywords: application portability, application interoperability, open system environment, User Organization OSE Profile

POSIX is a registered trademark of the Institute of Electrical and Electronics Engineers, Inc.

The Institute of Electrical and Electronics Engineers, Inc.
345 East 47th Street, New York, NY 10017-2394, USA

Copyright © 1999 by the Institute of Electrical and Electronics Engineers, Inc.
All rights reserved. Published 11 August 1999. Printed in the United States of America.

Print: ISBN 0-7381-1541-X SH94711
PDF: ISBN 0-7381-1542-8 SS94711

No part of this publication may be reproduced in any form, in an electronic retrieval system or otherwise, without the prior written permission of the publisher.

IEEE Standards documents are developed within the IEEE Societies and the Standards Coordinating Committees of the IEEE Standards Association (IEEE-SA) Standards Board. Members of the committees serve voluntarily and without compensation. They are not necessarily members of the Institute. The standards developed within IEEE represent a consensus of the broad expertise on the subject within the Institute as well as those activities outside of IEEE that have expressed an interest in participating in the development of the standard.

Use of an IEEE Standard is wholly voluntary. The existence of an IEEE Standard does not imply that there are no other ways to produce, test, measure, purchase, market, or provide other goods and services related to the scope of the IEEE Standard. Furthermore, the viewpoint expressed at the time a standard is approved and issued is subject to change brought about through developments in the state of the art and comments received from users of the standard. Every IEEE Standard is subjected to review at least every five years for revision or reaffirmation. When a document is more than five years old and has not been reaffirmed, it is reasonable to conclude that its contents, although still of some value, do not wholly reflect the present state of the art. Users are cautioned to check to determine that they have the latest edition of any IEEE Standard.

Comments for revision of IEEE Standards are welcome from any interested party, regardless of membership affiliation with IEEE. Suggestions for changes in documents should be in the form of a proposed change of text, together with appropriate supporting comments.

Interpretations: Occasionally questions may arise regarding the meaning of portions of standards as they relate to specific applications. When the need for interpretations is brought to the attention of IEEE, the Institute will initiate action to prepare appropriate responses. Since IEEE Standards represent a consensus of all concerned interests, it is important to ensure that any interpretation has also received the concurrence of a balance of interests. For this reason, IEEE and the members of its societies and Standards Coordinating Committees are not able to provide an instant response to interpretation requests except in those cases where the matter has previously received formal consideration.

Comments on standards and requests for interpretations should be addressed to:

Secretary, IEEE-SA Standards Board
445 Hoes Lane
P.O. Box 1331
Piscataway, NJ 08855-1331
USA

Note: Attention is called to the possibility that implementation of this standard may require use of subject matter covered by patent rights. By publication of this standard, no position is taken with respect to the existence or validity of any patent rights in connection therewith. The IEEE shall not be responsible for identifying patents for which a license may be required by an IEEE standard or for conducting inquiries into the legal validity or scope of those patents that are brought to its attention.

Authorization to photocopy portions of any individual standard for internal or personal use is granted by the Institute of Electrical and Electronics Engineers, Inc., provided that the appropriate fee is paid to Copyright Clearance Center. To arrange for payment of licensing fee, please contact Copyright Clearance Center, Customer Service, 222 Rosewood Drive, Danvers, MA 01923 USA; (978) 750-8400. Permission to photocopy portions of any individual standard for educational classroom use can also be obtained through the Copyright Clearance Center.

Contents

Table of Figures

Introduction

[This introduction is not a normative part of IEEE Std 1003.23-1998, IEEE Guide for Developing User Organization Open System Environment (OSE) Profiles, but is included for information only.]

This guide is intended to assist users, planners, and implementers in developing User Organization Open System Environment (OSE) Profiles that address the information processing and communications requirements of their organizations. Each organization has a different approach to the development of its profiles depending on many factors including the size of the organization. This guide is not intended to represent a complete design process, but rather one that focuses on standards selection and the development of User Organization OSE Profiles. This guide shall be supplemented by other complementary design techniques and design knowledge.

This guide records some general advice on one possible approach to the development and use of profiles. These profiles may be used for procurement, constructing a baseline for configuration management of Information Technology (IT) resources.

This guide introduces the reader to some of the terminology used in the international community to describe the principles, processes, and tools used to go from a set of requirements to a complete and refined system design.

This guide provides a “road map” to an open system design that achieves

Application software portability
Data portability between heterogeneous platforms
Application interoperability
User portability
Standards compliance
Implementation transparency
Distributed system scalability
Realization of the requirements and expectations of the user

IEEE Std 1003.23-1998 was prepared by the IEEE P1003.23 Working Group, sponsored by the Portable Applications Standards Committee of the IEEE Computer Society. At the time this standard was approved, the membership of the P1003.23 Working Group was as follows:

Portable Applications Standards Committee (PASC)

Chair: Lowell Johnson
Vice Chair: Joe Gwinn

1003.23 Working Group Officials

Chair: Sandra Swearingen
Technical Editor: Geoff Pickering

Working Group

Raj Avula
Doris Bernardini
David Blackwood
John Davies
Harvey Hindin
Jim Johnston
Bruce Kaminski
Kevin Lewis
Marisé Mikulis
Jim Oblinger
Wendy Rauch
Ray Ricco
Fritz Schulz
Charles Severence
Bill Smith
Nick Stoughton
William Wong

The following members of the balloting committee voted on this guide:

Michelle Aden
David Blackwood
Philip Enslow
Michel Glen
Joe Gwinn
Charles Hammons
William Hefley
Jim Isaak
Lowell Johnson
Judith Kerner
Thomas Kurihara
Kevin Lewis
Fang Ching Lim
Patricia Oberndorf
Raymond Ricco
Richard Seibel
Charles Severence
Bill Smith
Nick Stoughton
Sandra Swearingen
Mark-Rene Uchida
Ming De Zhou

When the IEEE-SA Standards Board approved this guide on 8 December 1998, it had the following membership:

Richard J. Holleman, *Chair* **Donald N. Heirman**, *Vice Chair*
Judith Gorman, *Secretary*

Satish K. Aggarwal
Clyde R. Camp
James T. Carlo
Gary R. Engmann
Harold E. Epstein
Jay Forster*
Thomas F. Garrity
Ruben D. Garzon
James H. Gurney
Jim D. Isaak
Lowell G. Johnson
Robert Kennelly
E.G. "Al" Kiener
Joseph L. Koepfinger*
Stephen R. Lambert
Jim Logothetis
Donald C. Loughry
L. Bruce McClung
Louis-Francois Pau
Ronald C. Peterson
Gerald H. Peterson
John B. Posey
Gary S. Robinson
Hans E. Weinrich
Donald W. Zipse

*Member Emeritus

Yvette Ho Sang
IEEE Standards Project Editor

Guide for Developing User Organization Open System Environment (OSE) Profiles

Section 1: Overview

1.1 Scope

The purpose of this guide is to describe a process for developing User Organization OSE Profiles. This guide includes a framework for documenting user requirements; the IT services that support those requirements; and a means for identifying the standards, specifications, and interim solutions that will provide the required services. This guide also discusses the need for a transition plan for large systems and includes issues to consider when implementing User Organization OSE Profiles, such as conformance testing of OSE profiles.

This guide is concerned with the development of User Organization OSE Profiles and, therefore, discusses profile development in those terms and those terms only. The suggested profile development process described in Section 5 is applicable for all types of profile development including implementation using totally proprietary products and solutions.

This guide defines a User Organization OSE Profile expressed as a physical design (See 5.6), i.e., one that is expressed in terms of open system standards and gaps that are not addressed by current formal standards. Although guidelines are given about how to move from a physical (standards-based) design to an operational (product-based) design, this guide does not recommend any products or solutions to gaps. Rather, it guides readers in the decision-making process for their resolution. Readers are encouraged to adopt these guidelines within the context of the business and technology strategies of their organizations.

1.2 What is an OSE?

OSE describes the functionality necessary to provide portability and interoperability of computer applications across networks of heterogeneous hardware and software platforms.

1.3 What is an OSE Profile?

An OSE Profile is a selected suite of standards and standards options that defines behavior at interfaces in terms of function calls, protocols, data formats, etc. for a particular class or domain of applications.

User Organization OSE Profiles are specifications that capture the IT needs of an entire organization (or a part of it) in a formal way. User Organization OSE Profiles can be used for

any or all of the following activities:

— To inventory existing IT strategy
— To support IT procurement
— To drive the evolution of IT strategy for an organization.

As a minimum, a User Organization OSE Profile identifies user requirements (a problem to be solved), the information services and IT that support those requirements, and standards or specifications that meet those requirements. This guide describes how to find specifications and how to evaluate how well a standard meets the user requirements. Often the users will have to choose among a set of competing specifications for their profiles. A profile can be used to record these possible choices and discuss the strengths and weaknesses of each specification.

Also, certain requirements may not yet be met by existing specifications and products. A profile is an excellent document to capture these "gaps" in user requirements. In addition, User Organization OSE Profiles may also include more details on the IT strategy for an organization, including

— The present and future requirements ("AS-IS" and "TO-BE") that the profile is addressing
  —Business strategy requirements
  —Business process (functional architecture) strategy requirements
  —IT strategy requirements
  —System management strategy requirements
  —End user requirements
— The standards that are deemed to meet those requirements, including
  —Formal standards
  —Emerging formal standards
  —*De facto* standards
— Systems that satisfy the requirements of the profile
— Migration plans for user requirements and services
— Strategies for migration from one IT approach to another

Given that the needs and strategy of an organization may be constantly changing, the corresponding profile that documents those needs must also change and evolve.

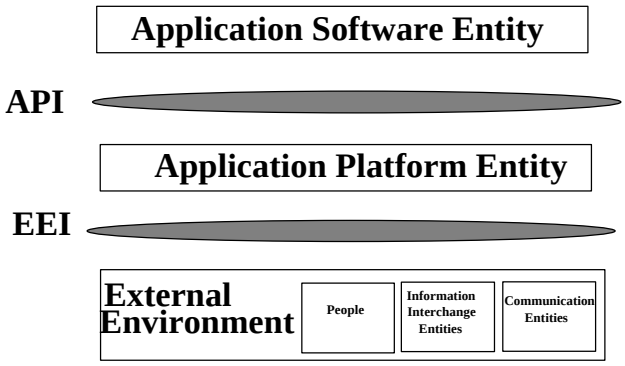
Organizations have been developing "profiles" for many years without actually knowing it. For instance, User Organization OSE Profiles may currently be called

— Procurement Specifications
— Strategic Plans
— Recommended Practices
— Technical Architectures

1.3.1 The POSIX OSE Approach

The POSIX OSE approach is based on the capability of "de-coupling" the Application Platform (AP) entity from the Applications Software and the External Environment entities as shown in Figure 1-1.

Figure 1-1 - The OSE Reference Model



This de-coupling is facilitated by identifying all of the interfaces between the entities and includes services and supporting formats offered across the interfaces. An Open System Environment is achieved by first standardizing the Application Program Interfaces (APIs), External Environment Interfaces (EEIs), services, and formats. The system environment becomes "open" through the use of standards that were developed under an "open" process.

A number of definitions of "open" are currently used in the computer industry, for example

- Nonproprietary. This sense is usually intended when saying, 'X is open', where X can be Ada, POSIX, ANSI C, X Window system, etc. While in theory X can be nonproprietary without being a standard, formal or informal, in practice being a standard beyond the control of any one vendor or group of vendors is necessary.
- Interoperable. In this sense, an open system is easily configured to work with other systems. (A closed system makes no provisions for (or even forbids) connection to other systems.)
- Extensible. In this sense, an open system can be extended to cover uses and functions not envisioned by the system developer, without the help or permission of that developer. (A closed system cannot be extended by users or other vendors without great effort and/or compromise of function.)

Figure 4-1 shows some of these interfaces and major service areas. This model is flexible enough to support different architectures such as the often used client-server architecture. The client-server architecture is accomplished by replicating the model and connecting the two models via the external communications interface. This approach has been used in the view of IT Service models in this document. This approach requires the addition of distributed services to the new list of major service areas for the model.

Each of the major service areas are then decomposed into IT Services (as shown in the example IT Service list contained in section 5), which are often specified by a “base standard." The work does not end there. Often a base standard has options and lacks implementation conventions. These options need to be chosen. Even though two vendors might be “conformant” to the base standard, interoperability is not guaranteed unless both choose the same options and implementation conventions. It is important to remember these subtleties while developing the User Organization OSE Profile. Prototyping the Physical Design helps to facilitate selection options and implementation conventions. Conformance and interoperability testing is discussed in Section 7. This work is hard, but the benefits are many--competition in the market place and a hedge against obsolescence of hardware and software.

Data elements and their attendant standards are a necessary underpinning of a User Organization OSE Profile. The proper choice and implementation of the data element definition, data dictionaries, and business process and entity relationship diagrams insure both the portability of the profile as well as the portability and interoperability of the data, applications, and IT Services.

This guide addresses several of the user needs requirements and issues necessary for the development of User Organization OSE Profiles with the exception of user expectations of what the profile will provide. These expectations, although not documented here, are just as real and important to the user as their requirements.

1.3.2 User Organization OSE Profile Development Process

The approach used in this guide to develop a User Organization OSE Profile is shown below and is described in detail in Section 5. The steps are as follows:

(1) Determine the scope of the profile (BAs or domains to be addressed, such as finance).

(2) Gather the user organization functional requirements (business functions to be performed within each BA, such as customer services).

(3) Identify BSRs and FQs, e.g., pay employees every week on time.

(4) Identify information service requirements, such as DB management and transaction processing.

(5) Identify ITs needed to meet the information service requirements (often referred to as the Logical Design).

(6) Develop a Physical Design and select base standards (often referred to as point design).

(7) Analyze the Physical Design to make sure that it meets the BSRs and FQs.

(8) Fine tune the Physical Design.

(9) Fine tune selection of base standards, associated options, and products (often called an Operational Design).

(10) Determine life-cycle cost of proposed solution.

(11) Prototype the Physical Design of the accepted solution.

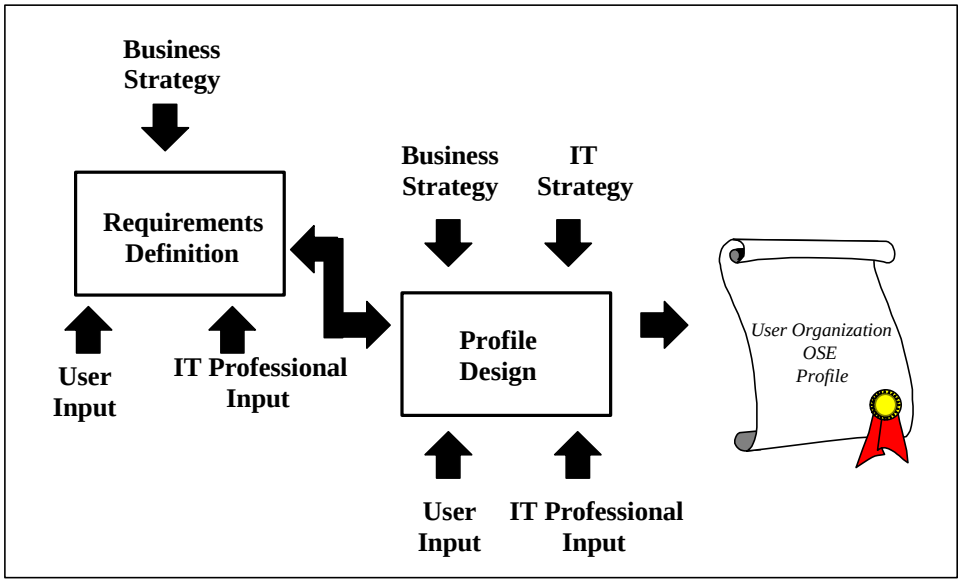
Many organizations call for the prototyping of the Physical Design at Step 6 to reduce risk. Applying the prototyping sub-process early also helps with completing Steps 7, 8, 9, and 10. Often, the resulting Physical Design is too expensive and requires modifications.

If the Physical Design does prove to be too expensive, revisiting the BSRs may be beneficial. For instance, one could change the way the employees are paid, (using electronic fund transfer instead of printing and mailing checks to the employees, or paying the employees every two weeks instead of every week). This sub-process is often called Business Process Improvement. Others know it as the "AS-IS" and "TO-BE" process. Many apply this sub-process in the beginning of the requirements definition phase (Step 2). The User Organization OSE Profile is composed of the results of Steps 8 and 9. Maintaining the results from Steps 1 through 5 in the same document is helpful. A suggested outline for this document is given in Section 6. Sample User Organization OSE Profiles can be found in Annex B.

1.4 Life-Cycle Approach

This guide approaches user organization profiles from a "life cycle" viewpoint. The life cycle is composed of a Requirements Definition phase, a Design phase, an Implementation phase, and a Maintenance phase. Figure 1-2 shows the interrelationship between the "top-down" business strategy and the "bottom-up" user/IT professional inputs in the User Organization OSE Profile development process.

Figure 1-2 - The Interrelationship between Business Requirements and the Specification of Technical Solutions



1.4.1 The Requirements Definition Phase

In the Requirements Definition phase, both functional and technical requirements of the profile are described. This phase may be triggered by a change in technology or corporate or business strategy. These requirements may come from many sources:

— The users of the services
— The business plan of the organization
— The current and future IT strategy of the organization
— Study of existing systems in use by the organization

1.4.2 The Design Phase

In this phase, point designs are produced. They result in profiles that identify standards and interface definitions that meet the requirements. Often the various point designs or alternatives are evaluated for risk and life cycle costs that may cause some requirements and designs to be modified.

1.4.3 The Implementation Phase

Once the preferred alternative is selected, a more detailed profile (including standards implementation options) is developed. This profile can be used as a procurement specification. Once the system hardware and software are in hand, testing against the functional and performance requirements is conducted. If a product or platform has already passed vendor conformance tests, the testing phase may be somewhat reduced, provided that no significant architectural mismatch problems are present. Testing is discussed in more detail in 7.1.

1.4.4 The Maintenance Phase

After testing is successfully completed, the system is turned over to maintenance. The profiles continue to be useful as a configuration management tool. In this phase, the profile moves from a procurement document to a complete IT strategy document that describes long-term and short-term IT plans for an organization.

1.5 Profile Reuse

Profiles are intended to be reusable, dynamic documents that make planning and procurement of IT solutions more efficient for both the users and producers of IT.

An important part of profile efforts (for many organizations) is sharing profile documents between organizations to identify common areas in terms of their IT approaches. Sharing portions of profiles gives the profile development broader application. As the number of organizations that use a profile increases, the respect that the profile gains from computer technology vendors also increases.

At some point, sharing a profile across an entire industry, such as petrochemical, university, or auto manufacturing, may be practical.

1.6 How to Use This Profiling Method

The road map described in this guide addresses a business-requirement-driven method for developing User Organization OSE Profiles. The totality of this approach may not be applicable in all cases; users should adopt the steps and stages that are pertinent to their particular situation. However, for communication and reuse, maintaining terminology consistency is important.

1.7 Benefits of User Organization OSE Profiles

The benefits of the approach to developing User Organization OSE Profiles as described in this guide are as follows

— It is vendor independent.
— It supports any technology paradigm.
— It acts as a means of communication between business and technology.
— It facilitates integration and interoperability now and in the future.
— It provides an investment framework for maximizing the return on technology investments.
— It provides a visual and comprehensive set of results.

Section 2: General

2.1 Normative Reference

The following guide contains provisions that, through references in this text, constitute provisions of this guide. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on these standards are encouraged to investigate the possibility of applying the most recent editions of the standards. Members of IEC and ISO maintain registers of currently valid International Standards.

{1} ISO/IEC 14252: 1995[1], (IEEE Std 1003.0-1995[2]), *Guide to the POSIX Open System Environment.*

2.2 Conformance

In accordance with the precedent of ISO/IEC 14252: 1995[3], it is not appropriate to claim conformance to this guide because it contains no mandatory requirements. This guide is not intended to mandate the employment of any particular profile, architecture, or implementation. However this guide is intended to be a source of various profile structures and to show examples of how they might be derived. Thus conformance testing to this guide is not applicable.

2.3 Methods

Test methods are not applicable to a guide.

2.4 Trademarks, Brand Names and Product Names

This guide contains references in the examples to trademarks, brand names and product names. The use of these references does not imply endorsement or implication of POSIX conformance. They are for illustration only.

---

(1) ISO documents can be obtained from the ISO office, 1, rue de Varembe, Case Postale 56, CH - 1211, Geneve 20, Switzerland/Suisse (http://www/iso.ch/)

(2) IEEE publications are available from the Institute of Electrical and Electronics Engineers, 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855-1331, USA (http://www.standards.ieee.org/)

(3) For information or references, see 2.1.

Section 3: Terminology

3.1 Conventions

This guide uses no specific editorial and typographical conventions.

3.2 Definitions

3.2.1 Terms

For the purpose of this guide, the following definitions apply. The main source of these definitions is ISO/IEC 14252: 1995. Where no source is quoted the term is defined within this guide.

3.2.1.1 accredited standards development organization: An organization recognized as a standards development organization by an international formal standards body (such as ISO, IEC, or ITU-T) or recognized as a standards development organization by one of the member bodies of one of these organizations (e.g., a national standards organization) (ISO/IEC 14252: 1995)

3.2.1.2 application environment profile: A combination of multiple standards as well as single-standard profiles that specify diverse types of functionality needed for a particular environment. (ISO/IEC 14252: 1995)

3.2.1.3 application platform: A set of resources, including hardware and software that support the services on which application software will run. (ISO/IEC 14252: 1995)

The application platform provides services at its interfaces that, as much as possible, make the specific characteristics of the platform transparent to the application software.

3.2.1.4 application software: Software that is specific to an application and is composed of programs, data, and documentation. (ISO/IEC 14252: 1995)

3.2.1.5 application program interface (API): The interface between the application software and the application platform across which all services are provided. (ISO/IEC 14252: 1995)

3.2.1.6 base standard: An approved international standard, technical report, ITU-T recommendation, or national standard. (ISO/IEC 14252: 1995)

3.2.1.7 business area (BA) [domain]: The logical subdivision of an enterprise into areas of similar business directions, e.g., finance, sales and marketing.

3.2.1.8 business function: A set of processes that support the attainment of a particular business goal.

3.2.1.9 business system requirement (BSR): The enterprise-driven requirement for a business system, i.e., a set of processes, procedures, and documentation supported by technology to deliver either a major CSF or a KPI in the measurement of the attainment of the enterprise business goals and vision.

3.2.1.10 communications services interface (CSI): The boundary across which access to services for interaction between internal application software entities and application platform external entities is provided. (ISO/IEC 14252: 1995)

3.2.1.11 component profile: A profile that is made up of a formally defined subset of a single standard. (ISO/IEC 14252: 1995)

3.2.1.12 critical success factor (CSF): A business system performance measurement that combines with other CSFs to form a KPI.

3.2.1.13 *de facto* standard: A standard that is developed informally when one or more entities develop a product or technology and, through success and imitation, that product or technology becomes so widely used that deviation causes compatibility problems or limits marketability. (ISO/IEC 14252: 1995)

3.2.1.14 emerging standard: A specification that is under consideration by an accredited standards development organization, but has not completed the process of approval by the sponsoring body.

Emerging standards are often subject to significant changes prior to approval.

3.2.1.15 external environment: A set of entities, external to the application platform with which services are provided.

External entities include people, exchangeable media that is not mounted in the platform, communication wiring, and other platforms. (ISO/IEC 14252: 1995)

3.2.1.16 external environment interface (EEI): The interface between the application platform and the external environment across which services are provided.

The EEI is defined primarily in support of systems and application interoperability.

The primary services present at the EEI are

— HCI

— Information

— Communications (ISO/IEC 14252: 1995)

3.2.1.17 functional quality (FQ): A measure of the service level and performance expected in the support of a BSR by the technology solution proposed. These FQs may be used as assessment criteria for performance and conformance testing as well as for influencing the choice of standards to populate the physical design and the choice of products to turn the physical design into a (operational) solution that can be implemented.

3.2.1.18 hardware: Physical equipment used in data processing, as opposed to programs, procedures, rules, and associated documentation. (ISO/IEC 14252: 1995)

3.2.1.19 harmonization: The process of ensuring that standards (including profiles) do not overlap or conflict. (ISO/IEC 14252: 1995)

3.2.1.20 human/computer interface (HCI): The boundary across which the physical interaction between a human being and the application platform takes place. (ISO/IEC 14252: 1995)

3.2.1.21 information systems (IS) service: A high-level description of the services used to support a BSR. IS Services are cross-referenced to the BSRs they support, the IT Services that deliver them, and the technology components that house them.

3.2.1.22 information technology (IT) service: The most atomic level of technology. A group of IT Services will interoperate to deliver an IS Service in support of a BSR. IT Services are described in terms of protocols, APIs, and service components.

3.2.1.23 information technology (IT) service model: A textual and graphical representation of an IT Service where all the low-level service components and interfaces are identified.

3.2.1.24 informative: For information only. (ISO/IEC 14252: 1995)

3.2.1.25 interface: A shared boundary between two functional entities.

A standard specifies the service in terms of functional characteristics and behavior observed at the interface. The standard is a contract in the sense that it documents a mutual obligation between the service user and provider and assures a stable documented definition of that obligation. (ISO/IEC 14252: 1995)

3.2.1.26 interoperability: The ability of two or more systems to exchange information and use the information that has been exchanged mutually. (ISO/IEC 14252: 1995)

3.2.1.27 key performance indicator (KPI): A measurement of the performance of a particular business system in terms of the aims and goals of an enterprise.

3.2.1.28 locale(s): The definition of the user environment that depends on language and cultural conventions. (ISO/IEC 14252: 1995)

3.2.1.29 normative: A mandatory set of instructions or references.

3.2.1.30 open specifications: Specifications that are maintained by an organization that uses an open, public consensus process to accommodate new technologies and user requirements over time. (ISO/IEC 14252: 1995)

3.2.1.31 open system: A system that implements sufficient open specifications or standards for interfaces, services, and supporting formats to facilitate properly engineered application software

— To be ported with minimal changes across a wide range of systems from one or more vendors

— To interoperate with other applications on local or remote systems

— To interact with people in a style that facilitates user portability (ISO/IEC 14252: 1995)

3.2.1.32 open system environment (OSE): A comprehensive set of interfaces, services, and supporting formats, plus user aspects for interoperability or for portability of applications, data, or people, as specified by IT standards and profiles. (ISO/IEC 14252: 1995)

3.2.1.33 open system environment (OSE) profile: A selected suite of standards and standards' options that define behavior at interfaces in terms of functions calls, protocols, data formats, etc. for a particular class or domain of application. (ISO/IEC 14252: 1995)

3.2.1.34 point solution: A proposed systems architecture that contains enough specificity to determine what requirements can be met and at what cost. (ISO/IEC 14252: 1995)

3.2.1.35 portability (application software): The ease with which applications software and data can be transferred from one application platform to another. (ISO/IEC 14252: 1995)

3.2.1.36 POSIX: Portable Operating Systems Interface. A family of standards, which define a standard operating system interface, plus the environment to support application portability at the source code level.

3.2.1.37 POSIX standardized profile (POSIX SP): A standardized profile that specifies the application of certain POSIX base standards in support of a class of applications and does not require any departure from the structure defined by the reference model for POSIX systems in ISO/IEC 14252-1995. (ISO/IEC 14252: 1995)

3.2.1.38 profile: A set of one or more base standards and, where applicable, the identification of chosen classes, subsets, options, and parameters of those base standards that are necessary for accomplishing a particular function. See also application environment profile, (3.2.1.2) POSIX standardized profile, (3.2.1.37) and user organization OSE profile (3.2.1.53). (ISO/IEC 14252: 1995)

3.2.1.39 protocol: A set of semantic and syntactic rules that determine the behavior of entities that interact. (ISO/IEC 14252: 1995)

3.2.1.40 publicly available specifications (PAS): Specifications that are available, without restriction, to anyone for implementation, sub-licensing, and distribution (i.e., sale) of that implementation. (ISO/IEC 14252: 1995)

3.2.1.41 reference model: A structured collection of concepts and their relationships that cover a subject, facilitate the partitioning of the relationships into topics relevant to the overall subject, and can be expressed by a common means of description. (ISO/IEC 14252: 1995)

3.2.1.42 road map: A high-level process outline.

3.2.1.43 scalability: The ability to provide functionality up and down a graduated series of application platforms that differ in speed and capacity. (ISO/IEC 14252: 1995)

3.2.1.44 service: A distinct part of the functionality that is provided by an entity on one side of an interface to an entity on the other side of the interface. (ISO/IEC 14252: 1995)

3.2.1.45 sockets: An interface to transport protocol. (IEEE P1003.1g -1998)

3.2.1.46 software: The programs, procedures, rules, and any associated documentation pertaining to the operation of an information processing system. (ISO/IEC 14252: 1995)

3.2.1.47 specification: A document that prescribes, in a complete, precise, verifiable manner, the requirements, design, behavior, or characteristics of a system or system component. (ISO/IEC 14252: 1995)

3.2.1.48 standard: A document, established by consensus and approved by an accredited standards development organization, that provides, for common and repeated use, rules, guidelines, or characteristics for activities or their results, aimed at the achievement of the optimum degree of order and consistency in a given context. (ISO/IEC 14252: 1995)

3.2.1.49 standardized profile: A balloted, formal, harmonized document that specifies a profile. (ISO/IEC 14252: 1995)

3.2.1.50 technology: Scientific knowledge used to achieve a practical purpose.

3.2.1.51 technology component model: The assembled IT Services required to deliver one or more IS Services to support the BSRs.

3.2.1.52 user: The source of the business drivers that the User Organization OSE Profile must address and support. In the context of this guide, the terms, user and user organization are interchangeable.

3.2.1.53 user organization OSE profile: A profile, documented in terms of open system (3.2.1.31) standards, POSIX standardized profiles (3.2.1.37), standardized profiles (3.2.1.49), and/or interim technologies or products, that is deemed by an organization to be required as the infrastructure basis of the solution to its business needs. (ISO/IEC 14252: 1995)

3.2.2 Acronyms and Abbreviations

3.2.2.1 ADM: Architecture Development Method

3.2.2.2 AEP: Application Environment Profile

3.2.2.3 AP: Application Platform

3.2.2.4 API: Application Program Interface

3.2.2.5 ATM: Asynchronous Transfer Mode

3.2.2.6 BA: Business Area

3.2.2.7 BSI: British Standards Institute

3.2.2.8 BSD: Berkley Software Distribution

3.2.2.9 BSR: Business System Requirement

3.2.2.10 CAD: Computer-Aided Design

3.2.2.11 CAE: Common Application Environment

3.2.2.12 CAM: Computer-Aided Manufacture

3.2.2.13 CAN: Campus Area Network

3.2.2.14 CCITT: Consultative Committee on International Telephony and Telegraphy, (see ITU-T)

3.2.2.15 CGI: Common Graphical Interface

3.2.2.16 CGM: Computer Graphics Metafile

3.2.2.17 C-ISAM: The C Language interface to Index Sequential file Access Mechanism

3.2.2.18 CM: Common Management

3.2.2.19 CORBA: Common Object Request Broker Architecture

3.2.2.20 CSF: Critical Success Factor

3.2.2.21 CSI: Communications Services Interface

3.2.2.22 DB: Database

3.2.2.23 DBMS: Database Management System

3.2.2.24 DCE: Distributed Computing Environment

3.2.2.25 DISC: Delivering International Solutions to Customers through International Standards

3.2.2.26 DTP: Distributed Transaction Processing

3.2.2.27 ECU: European Currency Unit

3.2.2.28 EDI: Electronic Data Interchange

3.2.2.29 EDIFACT: Electronic Data Interchange for Finance, Administration, Commerce and Trade

3.2.2.30 EG-OSE: Expert Group - Open System Environment

3.2.2.31 e-mail: electronic mail

3.2.2.32 EEI: External Environment Interface

3.2.2.33 EWOS: European Workshop on Open Systems

3.2.2.34 FIPS: Federal Information Processing Standard

3.2.2.35 FQ: Functional Quality

3.2.2.36 FTAM: File Transfer Access and Management

3.2.2.37 FTP: file transfer protocol

3.2.2.38 FTR: Federal Telecommunications Recommendation

3.2.2.39 FUR: Framework for User Requirements

3.2.2.40 GDI: Graphics Device Interface

3.2.2.41 GKS: Graphics Kernel System

3.2.2.42 HCI: Human/Computer Interface

3.2.2.43 IAB: Internet Activities Board

3.2.2.44 IDEF: Integrated Definition and Functional Modeling

3.2.2.45 IETF: Internet Engineering Task Force

3.2.2.46 I/F: Interface

3.2.2.47 IGES: Initial Graphics Exchange Specification

3.2.2.48 IS: Information Systems

3.2.2.49 ISDN: Integrated Services Digital Network

3.2.2.50 ISP: International Standardized Profile

3.2.2.51 IT: Information Technology

3.2.2.52 ITU-T: International Telecommunication Union Telecommunication Standards Bureau (formerly CCITT)

3.2.2.53 JPEG: Joint Photographic Experts Group

3.2.2.54 JFIF: JPEG File Interchange Format

3.2.2.55 JTC1: Joint Technical Committee 1

3.2.2.56 KPI: Key Performance Indicator

3.2.2.57 LAN: Local Are Network

3.2.2.58 LAPD: Link Access Protocol D

3.2.2.59 LLC: Logical Link Control

3.2.2.60 MAC: Media Access Control

3.2.2.61 MAN: Metropolitan Area Network

3.2.2.62 MAU: Media Access Unit

3.2.2.63 MIDI: Musical Instrument Digital Interface

3.2.2.64 MIB: Management Information Base

3.2.2.65 MTA: Message Transfer Agent

3.2.2.66 NFS: Network File System

3.2.2.67 NI: Network Interface

3.2.2.68 ODBC: Open Database Connectivity

3.2.2.69 OMG: Object Management Group

3.2.2.70 OODBMS: Object Oriented Database Management System

3.2.2.71 OS: Operating System

3.2.2.72 OSE: Open System Environment

3.2.2.73 OSF: Open Software Foundation

3.2.2.74 OSI: Open System Interconnection

3.2.2.75 PAS: Publicly Available Specifications. These are synonymous with the IEEE 1003.0-1995 definition of Public Specifications

3.2.2.76 PASC: Portable Applications Standards Committee of the IEEE Computer Society

3.2.2.77 PHIGS: Programmers Hierarchical Interactive Graphics Systems

3.2.2.78 POSC: Petrotechnical Open Software Corporation

3.2.2.79 POSIX: Portable Operating Systems Interface for Computer Environments

3.2.2.80 PPP: Point-to-Point Protocol

3.3.3.81 PSTN: Public Switched Telephone Network

3.2.2.82 RDA: Remote Database Access

3.2.2.83 RDBMS: Relational Database Management System

3.2.2.84 RFC: Request For Comments

3.2.2.85 RPC: Remote Procedure Call

3.2.2.86 SGML: Standard Generalized Markup Language

3.2.2.87 SNMP: Simple Network Management Protocol

3.2.2.88 SMTP: Simple Message Transfer Protocol

3.2.2.89 SP: Standardized Profile

3.2.2.90 SQL: Structured Query Language

3.2.2.91 TCP: Transmission Control Protocol

3.2.2.92 UDP: User Datagram Protocol

3.2.2.93 UI: User Interface

3.2.2.94 UUT: Unit Under Test

3.2.2.95 VTC: Video Teleconferencing

3.2.2.96 WAN: Wide Area Network

3.2.2.97 Win32: The set of Windows® interface guidelines and APIs as published by Microsoft®

3.2.2.98 WS: Workstation

3.2.2.99 XA: X/Open DTP RDBMS interface definition

3.2.2.100 XLIB: X Window System Library

3.2.2.101 XM: X/Open DTP Application interface definition

3.2.2.102 XPG: X/Open Portability Guide

3.2.2.103 XSI: X/Open System Interface

3.2.2.104 XTI: X/Open Transport Interface

3.2.2.105 2D: Two Dimensions

3.2.2.106 3D: Three Dimensions

Section 4: What is a User Organization OSE Profile?

4.1 The POSIX OSE Reference Model

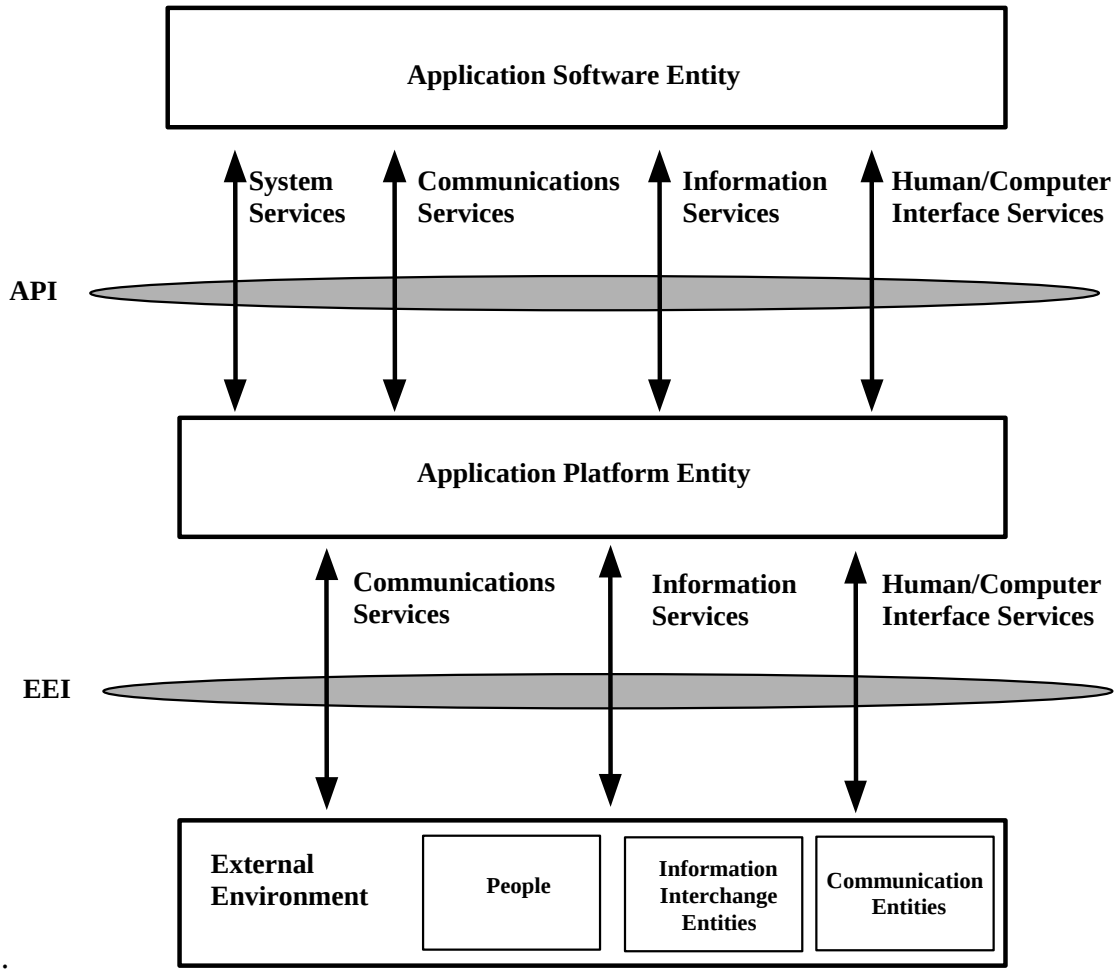
The POSIX OSE reference model, described in ISO/IEC 14252:1995, was developed to promote the portability of applications across multi-vendor platforms. Application portability enhances competition and de-couples the automatic upgrading of applications and platforms when the application or platform changes.

The POSIX OSE reference model identifies three entities (Application Software, Application Platform and External Environment) and two interfaces between them, identified as the API and the EEI.

The services provided are described below and shown in Figure 4-1:

- System — operating system and language services
- Communication — interoperability among systems
- Information — portability of data on storage devices
- HCI — portability of people

Standard specifications are used to provide these services. In order to provide these services completely, more than one standard is generally needed. Groupings of these standards to meet specific requirements are called profiles.



.

Figure 4-1 - POSIX OSE Reference Model

4.2 Types of Profiles

The relationship between standards and the different types of profiles is shown in Figure 4-2:

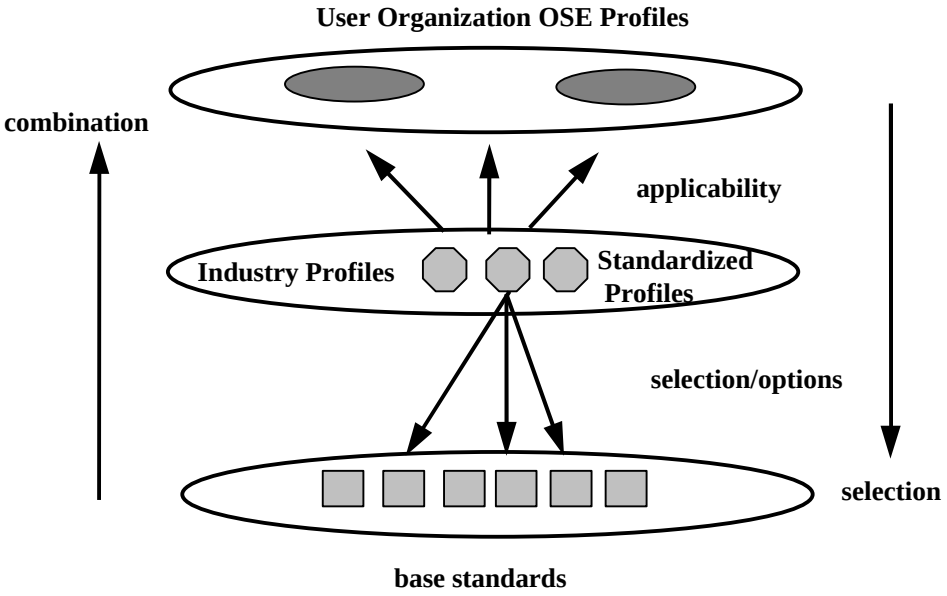


Figure 4-2 - Profiles and Standards

Various groups have already begun to use profiles. The most widely known profiles are those used to describe the communication suites used by the Open System Interconnection (OSI) model.

Single standard profiles such as FIPS 151-2 consist of a subset of a particular standard along with specific values for options and parameters. This type of profile is also known as a “component profile,” which is used as the basis for a specific implementation by a vendor.

An AEP may consist of a combination of multiple standards as well as single standard profiles that specify diverse types of functionality needed for a particular environment.

A POSIX standardized profile is a set of one or more POSIX base standards to describe a particular set of functionality. The POSIX real-time profile (IEEE 1003.13-1998) is an example.

An ISP is an internationally approved harmonized document that describes one or more profiles. ISP 11183: 1992 is an example.

User organizations may develop OSE profiles to describe the technology required to support their operations. A User Organization OSE Profile should include

(1) Scope and purpose of the user needs or requirements
(2) Reference to one or more base standards or other profiles
(3) Specific statements about which options are used from each base standard
(4) Resolution of gaps in the coverage of standards or conflicts between standards
(5) Conformance requirements of the profile

The desired goal of a profile is that it should be complete, coherent, and free from ambiguity.

OSE profiles help users and vendors make use of well-known OSE standards to acquire systems and services or describe the requirements for products.

4.3 User Organization OSE Profiles

User Organization OSE Profiles can address a much wider scope than the technical profiles described in 4.2. User Organization OSE Profiles can be used to describe the computer and communications technology, that support the operations of

— An entire enterprise (e.g., a vertically integrated petrochemical organization)
— A particular BA within an organization (e.g., the technical department of a petrochemical organization)
— A specific BSR (e.g., office automation)

This section is a detailed description of User Organization OSE Profiles. Section 5 includes a guide to the User Organization OSE Profile development process.

User Organization OSE Profiles, whatever their scope, address user requirements, information services, and the associated standards and profiles that provide those services. Sometimes needed services have not been standardized, and sometimes standards have no implementations. Where currently no standards address a needed information service, gaps in the technology are identified. Buying commercial off-the-shelf products or developing products until the standardization and profiling processes catch up with the business requirements can fill these gaps. The approach taken to filling the gaps will differ from organization to organization depending upon capabilities, time, and money constraints.

User Organization OSE Profiles operate at different levels depending upon the language used to describe them, as shown in Figure 4-3.

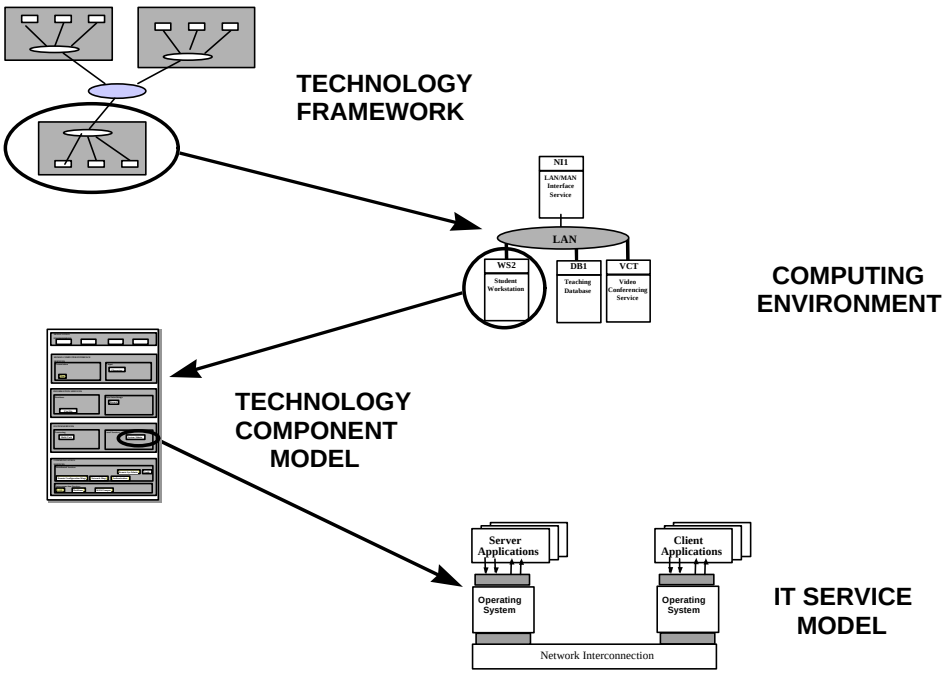


Figure 4-3 - Decomposition of a Technology Framework into its Constituent Components

At the highest level the User Organization OSE Profile describes the Technology Framework that is required to support the business needs of the enterprise. The Technology Framework represents the logical decomposition of the enterprise into BAs or domains.

Figure 4-4 shows the Technology Framework of a User Organization OSE Profile that addresses the needs of three BAs (domains) within a petrochemical company.

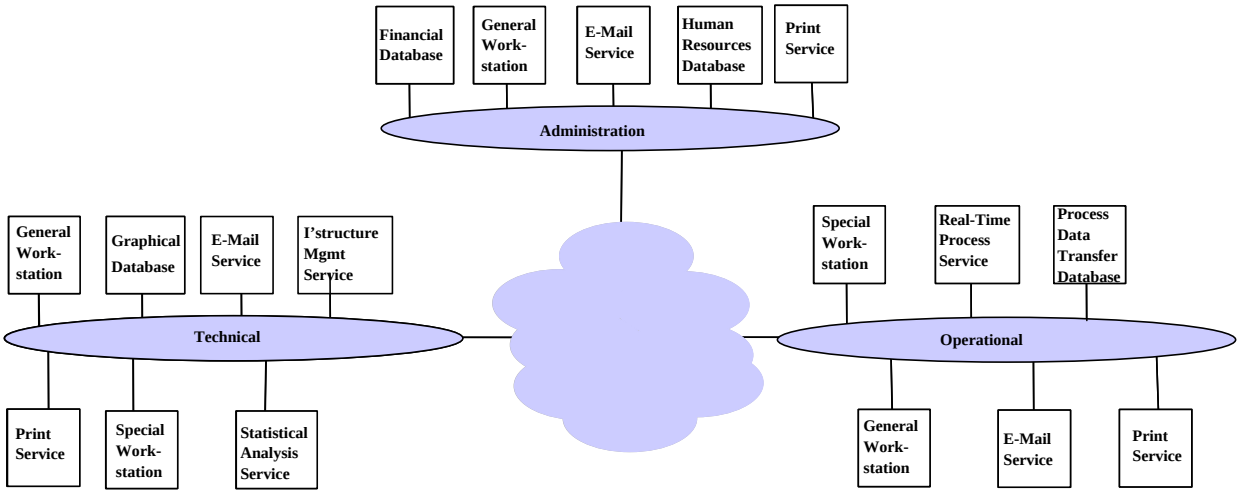


Figure 4-4 - Example of Technology Framework

At the next level the User Organization OSE Profile can be expressed in more detail in terms of Technology Components for each Computing Environment (BA or domain) that is to be addressed. The language used at this level of profile is that of the IS Services needed to support the BSRs of the enterprise.

Figure 4-5 shows the Technology Components needed to support the IS Services and hence the BSRs of a particular Computing Environment, that of the technical domain for a petrochemical company.

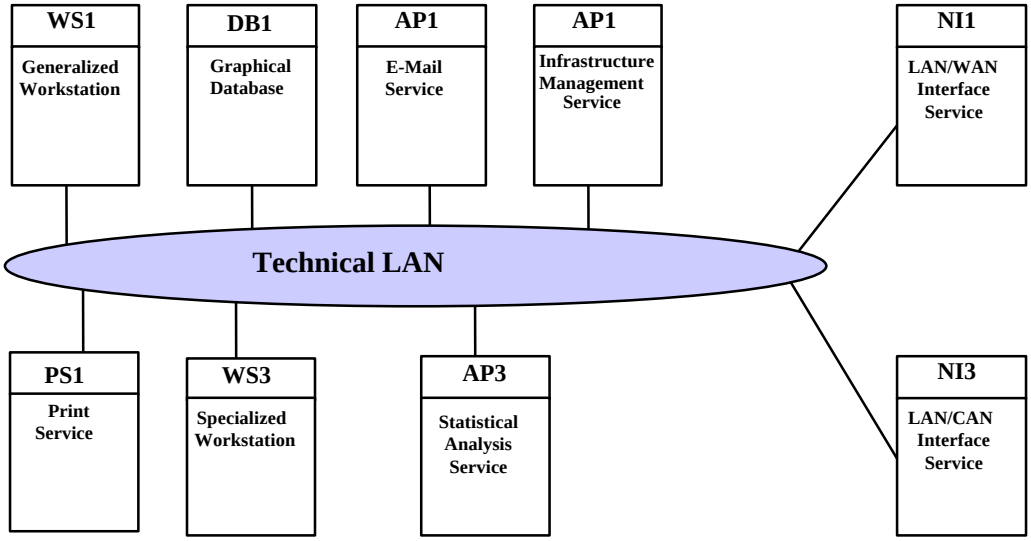


Figure 4-5 - Example of Technical Computing Environment

At the next level each Technology Component within the User Organization OSE Profile can be described by the set of IT Services needed to support that Technology Component. Figure 4-6 shows a Technology Component model that contains generic IT Services.

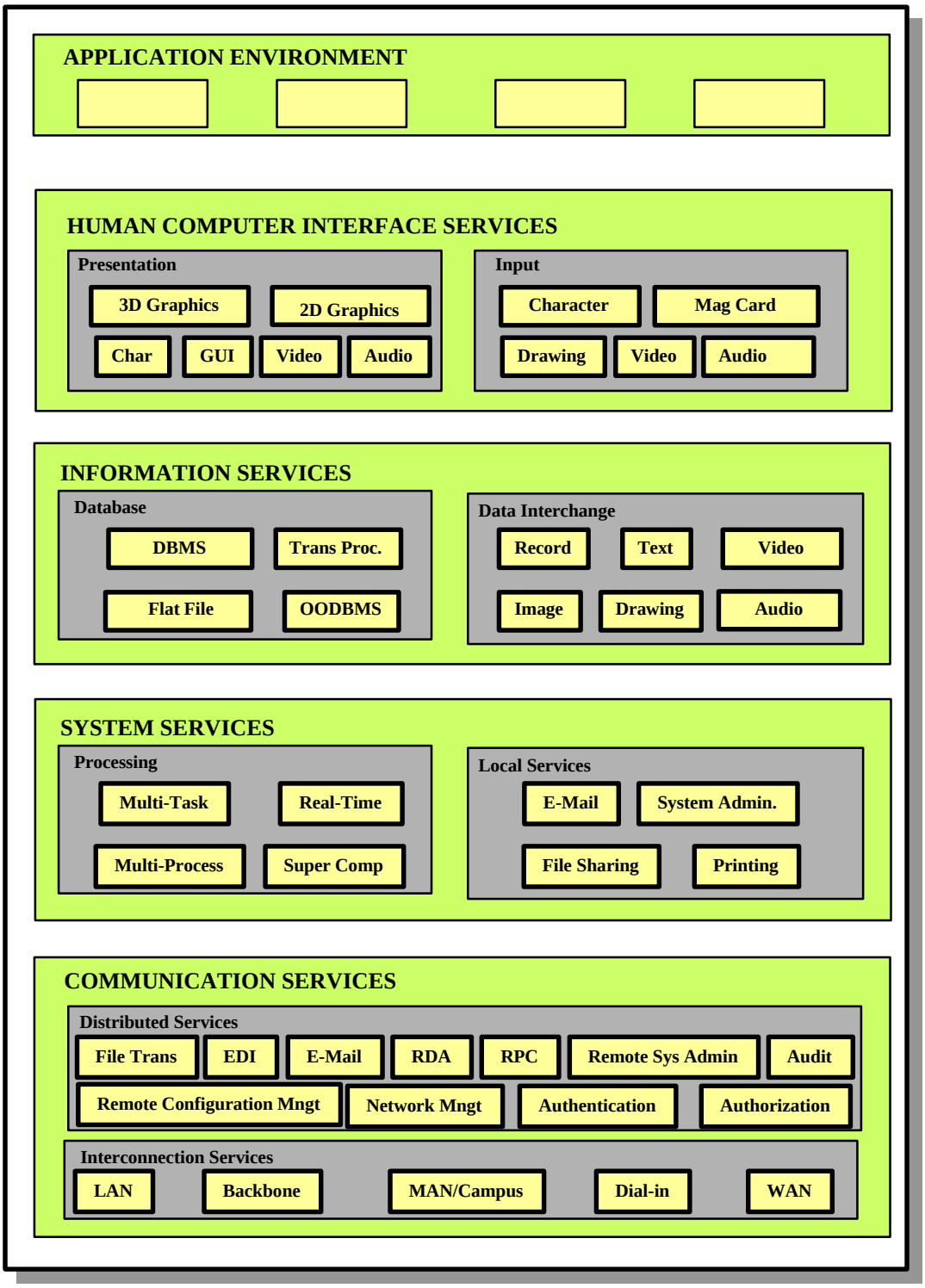


Figure 4-6 - Example of Technology Component Template

Specific Technology Components within each Computing Environment contain only the subset of IT Services that are required to deliver the BSRs of that environment. The specific Technology Components can be represented in Technology Component models that depict only those IT Services. Figure 4-7 shows the Technology Component model of an example Generalized WS.

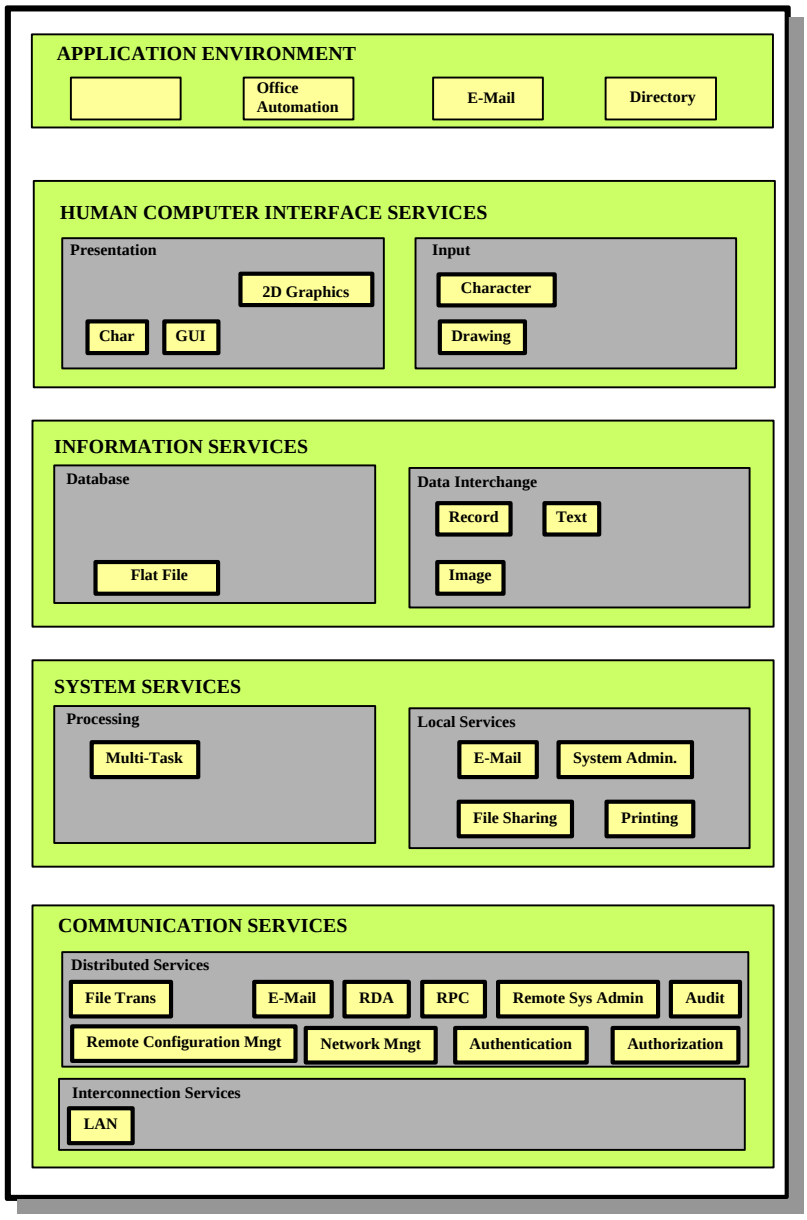


Figure 4-7 - Generalized WS; Technology Component [WS1]

Obviously the entire scope of the User Organization OSE Profile will be described by a number of Technology Component models.

At the lowest level each IT Service can be described as a generic (unpopulated) IT Service model and a populated (organization-specific) IT Service model.

The IT Service models use the same diagrammatic form as the OSE Reference Model (Figure 4-1) in that they identify the API and EEI interfaces as well as the platform services of the AP entity. Figure 4-8 shows a generic IT Service model for a Display Service.

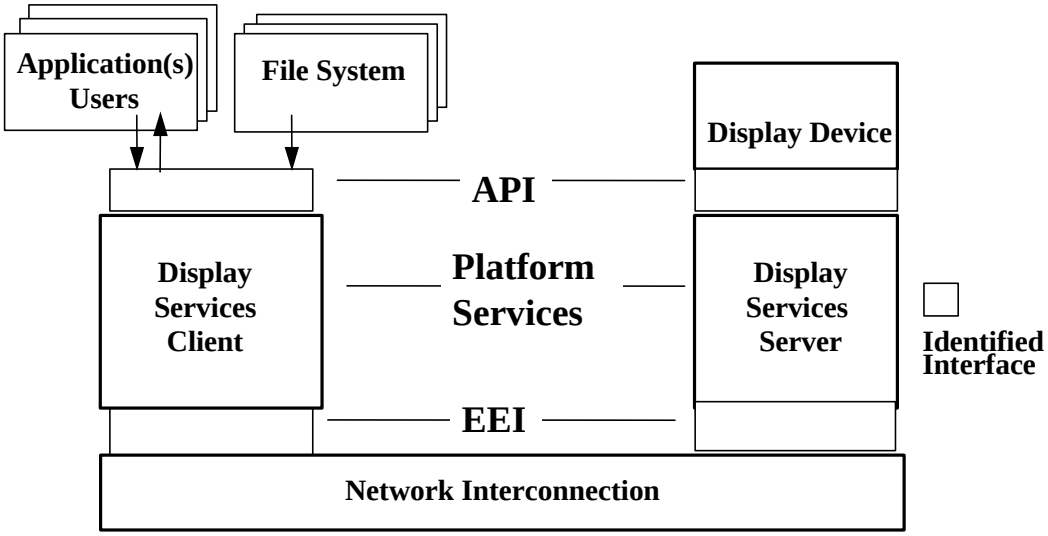


Figure 4-8 - Example of Generic IT Service Model (Display Service)

Figure 4-9 shows a populated IT Service model for Display Services in an OSE.

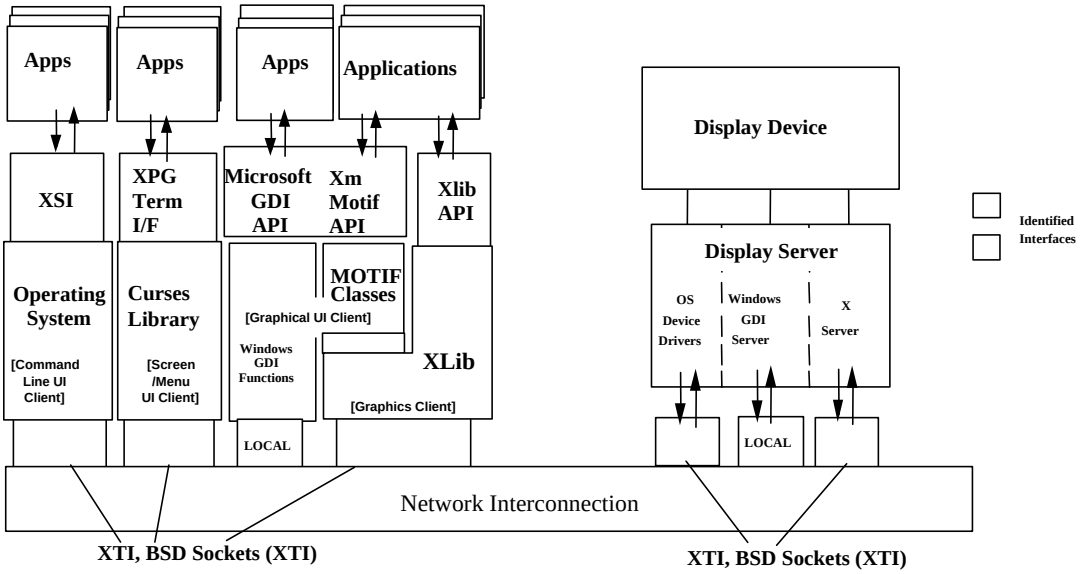


Figure 4-9 - Example of Populated IT Service Model (Display Service)

As shown in the example in Figure 4-9, a populated IT Service model is where the interfaces identified in the generic IT Service model have been defined in terms of their implementation in the form of standards or technical profiles.

Section 5: User Organization OSE Profile Development Process

5.1 Introduction

Today, many organizations understand the need to migrate to open systems that promote the goals of interoperability and portability of application software between systems. Using open systems technology to support the operational goals of an organization promotes vendor independence, provides flexibility in using communications and computer components and software, reduces training time, and facilitates the sharing of solutions to common problems. However, if the top-level management of an organization fails to describe its goals and priorities for achieving them to the people responsible for implementing the technology that supports those goals, many scarce resources, such as time, manpower, and money, will be spent implementing standard solutions to achieve interoperability and portability in areas that do not address the major concerns of management. IT professionals, experienced profile architects, may well be needed to facilitate the communication of the goals as usable business requirements for the profiling process.

Many methods for developing User Organization OSE Profiles have been published, including those published by suppliers of IT, those published by industry consortia, and vendor-independent methods. The method described in this guide is based upon a vendor-independent method for developing User Organization OSE Profiles that are derived from, and justified in terms of, operational needs and organizational requirements.

This approach links the business requirements to the technical solution through the User Organization OSE Profile. The profile requirements expressed in terms of the BSRs and the IS Services needed to support them are developed top-down. By contrast, the derivation of the IT Services needed to deliver the IS Services, expressed in terms of standards and products, are developed through an iterative, bottom-up process. This requires the expert input of IT professionals to resolve mismatches between the business requirements and viable standard or product availability in the marketplace. Additionally, the availability of a new technology standard or product may facilitate changes to the overall business strategy and hence the User Organization OSE Profile.

In this way business goals and requirements are tempered by technological feasibility and product availability. Equally, implementation decisions can temper the business drivers.

The development of a User Organization OSE Profile is a team process. The experience of many companies has shown that the optimum team size is between 6 and 12 people and that the team should consist of equal proportions of experienced profilers and experienced organization personnel. This team approach removes personal and particular technology bias from the development process by concentrating on collegial decision making. The team make-up also ensures that the goals and operational requirements of the organization or enterprise that will use the profile drive the process. Usually, the team will draw upon the knowledge and experience of IS and business experts as part of the User Organization OSE Profile development process.

5.2 The User Organization OSE Profile Process Model

The User Organization OSE Profile process can be described in outline by the process model shown in Figure 5-1, which is an expansion of the Requirements Definition and Profile Design phases of the life-cycle approach as depicted in Figure 1-2.

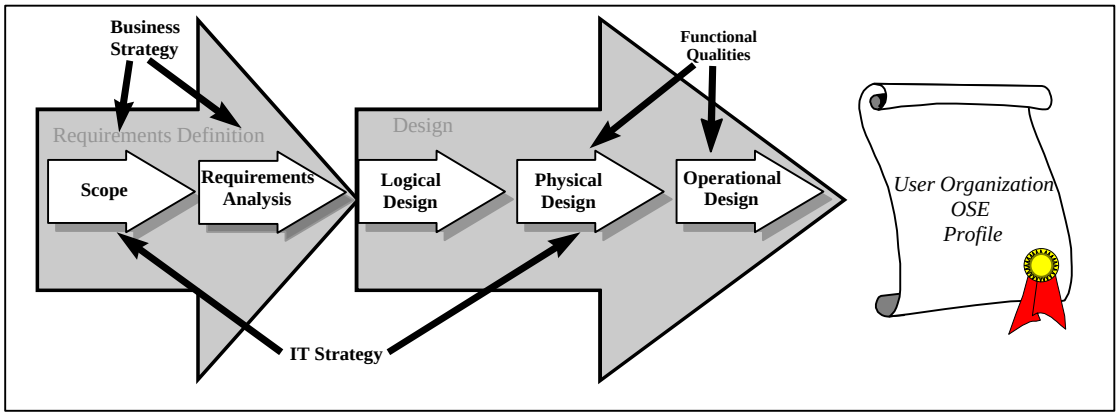


Figure 5-1 - User Organization OSE Profile Process

Clauses 5.2.1 through 5.2.5 briefly describe the phases in this process. Clauses 5.3 through 5.7 discuss each phase in more detail.

5.2.1 Scope

Scope is the definition of the scope of the profile, i.e., which BAs (domains) the profile addresses.

5.2.2 Requirements Analysis

Requirements Analysis is the determination of the representative set of BSRs, their FQs, and their decomposition into IS Services. The output from this phase is the BSR/IS Service cross-reference matrix.

5.2.3 Logical Design

Logical Design is the determination of the IT Services required to support the IS Services. The outputs of this phase are the Technology Framework, Computing Environments, Technology Component models, and the generic IT Service models plus IT/IS Service and IT Service/Technology Component model cross-reference matrices.

5.2.4 Physical Design

Physical Design is the population of the generic IT Service models and Technology Components with standards. Base standard options for interoperability must be determined and FQs used to decide which standards are applicable. Considering and specifying the locale(s) required and/or supported by the profile is important, particularly in multilingual and multicultural environments where an organization may use multiple locales.

A profile may specify two or more related standards that could conflict with one another. Conflicts often occur when two related standards have different revision cycles. For the profile to be definitive, an order of precedence should be defined.

The outputs from the Physical Design phase are the populated IT Service models, Technology Component models, and the User Organization OSE Standards Framework.

5.2.5 Operational Design

Operational Design is the application of FQs and requirements to the physical models and product selection. The output from this phase is the User Organization Products Catalog.

The Operational Design will be followed by a testing and transition plan. In the context of this guide, the User Organization OSE Profile is completed by the Physical Design stage.

5.3 Determine the Scope of the Profile (Scope Phase)

The benefits obtained from developing and implementing a User Organization OSE Profile can be expected to be directly proportional to the scope of the profile that is being developed. For example, a User Organization OSE Profile could cover a whole industry, an organization, or a department within an organization. One of the benefits of developing and implementing a profile for a large user organization is that it provides a vehicle for improving communication, particularly among the different groups that need to ensure that their systems will interoperate and that key applications software will be portable across vendor platforms.

The scope stage should address

— The BAs, (e.g., missions, departments) that are to be addressed by the profile
— The time-line for the profile, i.e., the strategic TO-BE date that the profile is to achieve
— All business and technical strategies, assumptions, and constraints
— Identification of a high-level business profile champion. A person of respect and authority within the organization that will facilitate, by leading from the front, the development, adoption, and implementation of the profile
— The profiling team resources and the availability of business expertise and knowledge.

5.4 Analyze the Document Requirements (Requirements Analysis Phase)

To ensure that resources are spent solving the interoperability and application software portability problems that are tied to the key goals of organizations, top-level managers should describe their goals in a manner that can be easily understood by mid-level managers, by acquisition personnel, and by engineers who are responsible for implementing the technical solutions. Operational goals are often referred to as business requirements by commercial industry, as mission requirements by military organizations, and as educational requirements by colleges and universities.

How can top managers define their requirements in a manner that will be easily understood by mid-level management and technicians? The British Standards Institute organization DISC developed a document in 1992 known as the FUR. The method described in the FUR recommends that a representative set of BSRs be identified through a process of service decomposition. The FUR concept was further enhanced and extended into a complete Architecture Development Method {B8}. This guide includes a description of the ADM for developing User Organization OSE Profiles as well as other techniques that have been successfully used. Identifying these goals can be done in three steps:

— Identify the BAs (domains)
— Identify the BSRs
— Derive the IS Services.

5.4.1 Identify the BAs

Depending upon the nature of the organization, BAs may be referred to as business, operational, mission, or educational areas. Each BA will deliver KPIs to the executive management of the organization. BAs should be thought of as areas of related business functions, which will span departmental and geographic boundaries within the organization. In Figure 5-2 the Royds refining operation (see B.2) is decomposed into its BAs.

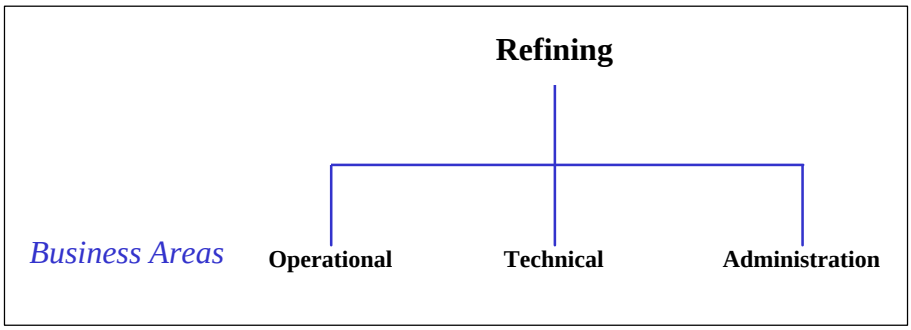


Figure 5-2 - Example of Decomposition into BAs

It is important that decomposition be logical rather than physical. Thus, the eventual User Organization OSE Profile will be derived from the real business needs of the enterprise. Therefore, any existing organizational structure or geographic distribution will not bias the User Organization OSE Profile.

5.4.2 Identify the BSRs

The next stage of the logical decomposition is to identify the BSRs for each of BAs. Again, depending upon the type of organization, BSRs may be referred to in such terms as operational, mission, or educational requirements. Identifying BSRs may involve a multilevel decomposition from the BA through major and even minor business functions to BSRs.

A BSR is defined as being a set of business needs that require technological support to deliver either a KPI or a top-ten CSF in the delivery of a KPI to the enterprise. Crucial to the validity of the eventual User Organization OSE Profile is a fully representative set of BSRs collected for each BA and covering the timeline of the scope of the profile. Frequently BSRs must be defined for future (not currently supported) requirements.

Of paramount importance are the BSRs of the IT delivery organization, e.g., preventive maintenance scheduling, service management, help desks.

Figure 5-3 shows an example decomposition of the Technical BA into BSRs.

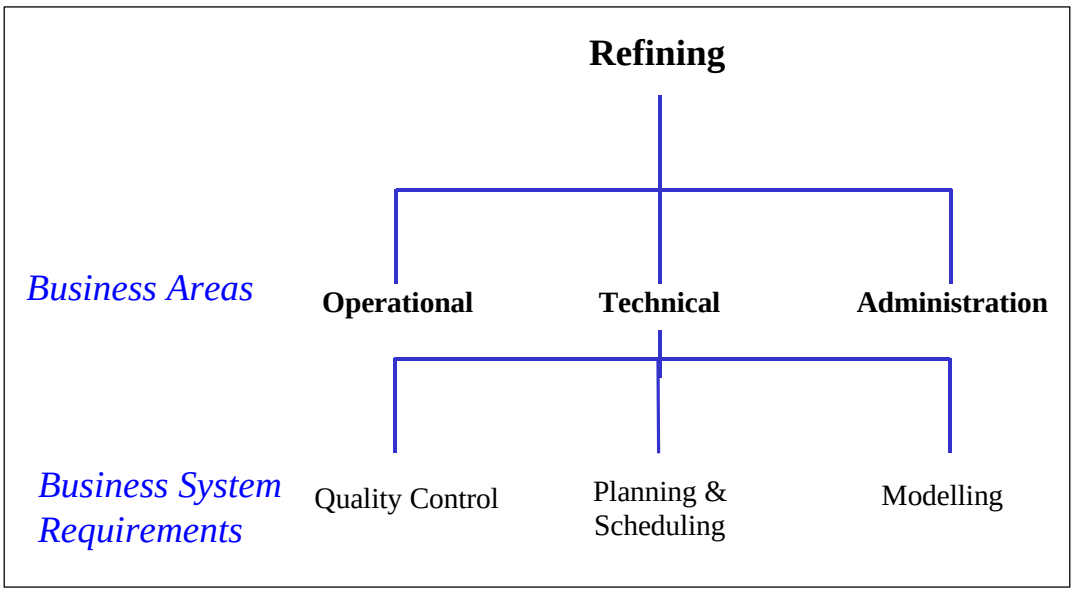


Figure 5-3 - Example of Decomposition of a Business Area into Business System Requirements

All the BSRs for the entire scope of the profile should be identified and documented in terms of their business objectives and FQs, i.e., user population, service level requirements. An example from the refining operations of Royds Lubricants (see B.2) is shown in Figures 5-4 and 5-5.

	Administration - BA	
	Finance	Sales, purchase and general ledger storage with update, inquiry, and reporting capabilities.
	Project Control	Project costing; resource control and management system.
	Human Resources	Roster planning with update, inquiry, and reporting capabilities.
	Technical - BA	
	Quality Control	Data storage, update, inquiry, and reporting of automated laboratory analysis systems.
	Modeling	Capacity modeling of plant processes based on real-time process control data.
	Planning and Scheduling	Production planning and scheduling.
	Operational - BA	
	Interface to Automated Refinery Operations	A real-time manager of managers for process control data gathering and transfer to the Administration and Technical services.

Figure 5-4 - Example of BSR Catalog

BSRs	Finance	Project Control	Human Resources	Quality Control	Modeling	Planning and Scheduling	Interface to Refinery Automation
FQs							
Total Users	100	50	50	50	150	50	100
Concurrent Users	50	25	25	25	70	10	50
DB requirements/Year	1GBytes	50GBytes	1GBytes	10GBytes	100MBytes	1GBytes	350MBytes
Number of Sites	1	1	5	5	1	1	1
Availability	12x5	12x5	12x5	12x5	12x5	12x5	24x7

Figure 5-5 - Example of BSR/FQ Matrix

The FQs of BSRs are later associated through the decomposition process with the IS Services, IT Services, Technology Components, and the standards that form the User Organization OSE Profile.

The business community should formally agree on the BSRs and prioritize them. Prioritizing the BSRs will define the totality of the business requirement that the profile must address and support.

BSRs are always written in the business language of the organization, thus providing the first step of directly linking business needs with the eventual technical solution.

5.4.3 Identify the IS Services Requirements

The next stage in the development of a User Organization OSE Profile is to decompose each BSR into the IS Services needed to support the BSR.

An IS Service is defined as being a particular information processing service that is required to support a BSR. For example, the BSR for production control in a manufacturing plant will require the support of the IS Services of real-time processing, DB management, document and image processing, storage and retrieval, etc.

The FQs associated with each BSR become the FQs of the IS Services needed to support that BSR.

As shown in Figure 5-6, a many-to-many relationship exists between BSRs and IS Services.

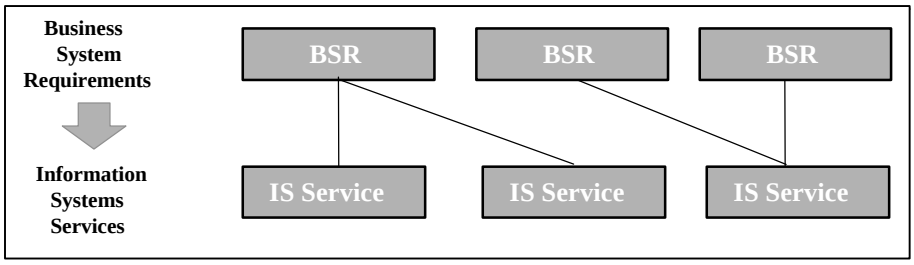


Figure 5-6 - Many-to-Many Relationship between BSRs and IS Services and BSRs

Perhaps the easiest way to both document the IS Services and Cross-reference them to the BSRs is by the use of a matrix. Figure 5-7 shows an example of a BSR/IS Service Cross-reference:

	1	2	3	4	5	6	7
Business System Requirements	Finance	Project Control	Human Resources	Quality Control	Modeling	Planning & Scheduling	Interface to Refinery Automatio
IS Services							
Office Automation	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	
Database Management	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**
Decision Support		**Y**	**Y**	**Y**	**Y**	**Y**	
Transaction Processing	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**
Process Control							**Y**
CAD/CAM					**Y**	**Y**	
Image Processing			**Y**		**Y**		**Y**
Statistical Analysis					**Y**		
Knowledge Processing		**Y**		**Y**	**Y**	**Y**	
Desktop Publishing					**Y**	**Y**	
Electronic Messaging				**Y**	**Y**		
Hypermedia Processing					**Y**		**Y**
Computer Conferencing					**Y**		
Video Conferencing	**Y**		**Y**	**Y**		**Y**	

Figure 5-7 - Example of BSR/IS Service Cross-Reference

The agreed BSRs, cross-referenced to the supporting IS Services, constitute the requirements specification for the User Organization OSE Profile. They also provide the information input to the delivery of the Technology Framework and Computing Environment diagrams shown in Figures 4-4 and 4-5.

This cross-reference also acts as the first stage of translating business requirements into technological solutions.

5.5 Identify the IT Services (Logical Design Phase)

The next stage in the profiling process is to derive the IT Services required to deliver the IS Services that are themselves necessary to support the business.

An IT Service represents a specific area of technology that is required to implement a particular IS Service.

The relationship between IS and IT Services is also many-to-many, as shown in Figure 5-8

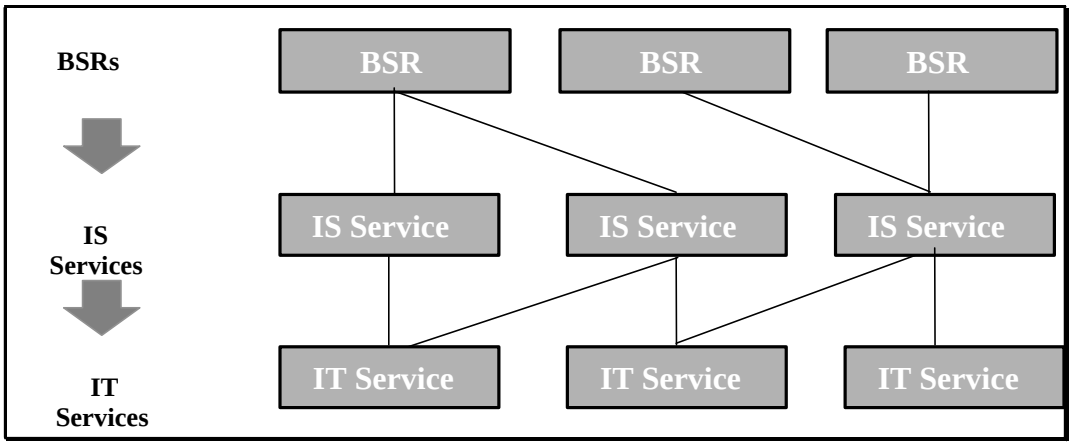


Figure 5-8 - IS/IT Service Relationship

The POSIX OSE reference model, (see Figure 4-1) defines four major groupings of OSE services:

— HCI
— System
— Information
— Communication

These groupings are of too high a level of aggregation to be easily implemented. Other models decompose these four groupings into “middle and/or lower level” groups.

The approach taken in this guide is to use three levels of decomposition as shown in Figure 5-9.

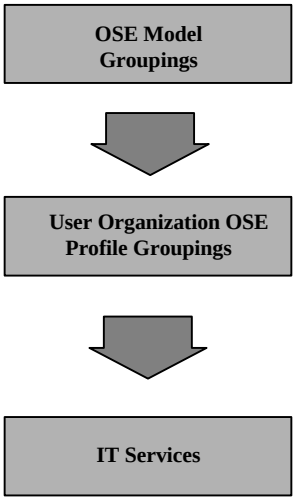


Figure 5-9 - IT Service Group decomposition

The OSE model groupings are the services defined in the POSIX OSE reference model. The User Organization OSE Profile groupings are originally used in the ADM {B8}. The IT Services are the lowest level of granularity and represent services that can easily be defined by standards and implemented in products. These IT Services are used throughout this document. This aggregation also makes the production of the Technology Component models easier, as shown in Figures 4-6 and 4-7.

Yet again, perhaps the easiest way of documenting this relationship is by the use of a matrix. Figure 5-10 shows an example of an IS/IT Service cross-reference matrix. It is usually beneficial to cross-reference the Technology Components with their IT Services. Figure 5-11 shows an example of a Technology Component/IT Services cross-reference matrix. Both these matrices come from the profile work done for Royds Lubricants (see B.2).

OSE Service Group	Human Computer Interface Services												System Services										Information Services												Communication Services											
IT Service Group	Presentation						Input						Processing						Local Services				Data Interchange						Database						Distributed Services										Interconnection		
IT Service	GUI	2D Graphics	3D Graphics	Character	Video	Audio	Character	Drawing	Video	Audio	Multi-tasking	Multi-processing	Real Time	Super-computing	E-Mail	Printing	File Sharing	System Admin.	Record	Text	Image	Drawings	Video	Audio	DBMS	ODBMS	Flat File	Trans. Processing	File Transfer	E-Mail	EDI	Remote DB Access	RPC	Remote System Admin.	Remote Config. Mgmt.	Network Management	Authentication	Authorisation	Audit	LAN	Back Bone	MAN	WAN
IS Services																																													
Office Automation	Y	Y		Y			Y				Y	Y			Y	Y	Y	Y		Y	Y					Y		Y					Y	Y	Y	Y	Y	Y	Y					
Database Management		Y		Y			Y				Y	Y				Y	Y	Y	Y	Y					Y	Y			Y		Y		Y	Y	Y	Y	Y	Y	Y					
Decision Support		Y		Y			Y				Y	Y				Y	Y	Y	Y	Y					Y	Y	Y						Y	Y	Y	Y	Y	Y	Y					
Transaction Processing				Y			Y				Y	Y				Y	Y	Y	Y	Y					Y	Y	Y	Y			Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Process Control	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y			Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
CAD/CAM	Y	Y	Y	Y	Y	Y	Y	Y			Y	Y																																	
Image Processing	Y	Y	Y				Y	Y			Y	Y				Y	Y	Y	Y	Y	Y	Y			Y				Y		Y		Y	Y	Y	Y	Y	Y	Y					
Statistical Analysis	Y	Y	Y	Y	Y		Y		Y		Y	Y		Y		Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y		Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Knowledge Processing				Y			Y				Y	Y				Y	Y	Y	Y	Y					Y				Y		Y		Y	Y	Y	Y	Y	Y	Y					
Desktop Publishing	Y	Y		Y			Y	Y			Y	Y				Y	Y	Y	Y	Y	Y				Y		Y		Y		Y		Y	Y	Y	Y	Y	Y	Y					
Electronic Messaging				Y			Y				Y	Y			Y	Y	Y	Y	Y	Y							Y		Y	Y			Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Hypermedia Processing	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y				Y	Y	Y	Y	Y	Y	Y	Y	Y			Y		Y			Y	Y	Y	Y	Y	Y	Y	Y					
Computer Conferencing	Y	Y		Y			Y				Y	Y			Y	Y	Y	Y	Y	Y							Y		Y	Y			Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Video Conferencing	Y					Y	Y		Y	Y	Y	Y	Y			Y	Y	Y			Y	Y	Y	Y				Y					Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Figure 5-10 - Example IS/IT Service Cross-reference

OSE Service Group		Human Computer Interface Services								System Services									Information Services														Communication Services																
IT Service Group		Presentation					Input								Processing				Local Services					Data Interchange								Database				Distributed Services												Intercon-nection			
IT Service	GUI	2D Graphics	3D Graphics	Character	Video	Audio	Character	Drawing	Mag Card	Video	Audio	Multi-tasking	Multi-processing	Real Time	Super-computing	E-Mail	Printing	File Sharing	System Admin.	Record	Text	Image	Drawings	Video	Audio		DBMS	ODBMS	Flat File	Trans. Proc.	File Transfer	E-Mail	EDI	Remote DB Access	RPC	Remote System Admin.	Remote Config. Mgmt.	Network Management	Authenticatio	Authorisation	Audit	LAN	Back Bone	MAN	WAN
Technology Component																																														
Modelling Workstation	Y	Y	Y	Y			Y	Y				Y					Y	Y			Y	Y	Y	Y				Y		Y		Y			Y			Y	Y	Y					
Control Workstation	Y			Y			Y			Y		Y				Y	Y	Y			Y	Y	Y	Y				Y		Y	Y	Y			Y			Y	Y	Y					
Display					Y							Y									Y	Y	Y	Y				Y		Y					Y					Y					
CAD Workstation	Y	Y	Y	Y	Y		Y	Y		Y		Y				Y	Y	Y			Y	Y	Y					Y		Y					Y			Y	Y	Y					
Visualisation Workstation	Y	Y	Y	Y	Y		Y	Y		Y		Y	Y		Y	Y	Y	Y			Y	Y	Y	Y				Y		Y					Y			Y	Y	Y					
Entry & Enquiry Workstation	Y	Y		Y	Y	Y	Y			Y	Y	Y					Y	Y			Y	Y	Y					Y		Y	Y				Y			Y	Y	Y					
Customer Enquiry Workstation	Y	Y		Y			Y					Y					Y	Y			Y	Y						Y		Y					Y			Y	Y	Y					
Data Logger		Y		Y			Y		Y			Y		Y							Y							Y		Y					Y					Y					
Database Server							Y					Y	Y			Y	Y	Y			Y	Y	Y					Y		Y					Y					Y					Y
GIS Database Server							Y			Y		Y	Y	Y	Y	Y	Y	Y			Y	Y	Y					Y		Y					Y					Y					Y
CAD Drawing Database Server							Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y			Y	Y	Y					Y		Y					Y					Y					Y
Knowledge Server							Y			Y	Y	Y	Y			Y	Y	Y			Y	Y	Y					Y		Y					Y					Y					Y
Distribution Server							Y					Y	Y			Y	Y	Y			Y	Y	Y					Y		Y					Y					Y	Y				Y
On-line Data Gateway Server							Y					Y	Y			Y	Y	Y			Y	Y	Y					Y		Y					Y					Y	Y				Y
Batch Data Gateway Server							Y					Y	Y				Y	Y			Y	Y	Y					Y		Y					Y					Y	Y				Y
Workflow Server							Y			Y	Y						Y	Y			Y	Y	Y					Y		Y					Y					Y					
Print Server							Y	Y				Y					Y				Y	Y	Y					Y							Y					Y					
Corporate Server							Y	Y				Y	Y			Y	Y	Y			Y	Y	Y					Y		Y		Y			Y					Y					Y

Figure 5-11 - Example Technology Component/IT Service Cross-reference

An example of the IT Service groups and the individual IT Services that they comprise is shown in Figure 5-12:

OSE SERVICE GROUP	USER OSE PROFILE IT SERVICE GROUP	IT SERVICE
Human/Computer Interface Services	**Presentation**	Character (command line)
		GUI
		2D Graphics
		3D Graphics
		Video
		Audio
	Input	Character
		Drawing
		Bar Code
		Smart Card
		Video
		Audio
System Services	**Processing**	Multi-tasking
		Multi-processing
		Real-time
		Supercomputing
	Local Services	E-mail
		Printing
		File sharing
		Systems Administration
Information Services	**Data Interchange**	Record
		Text
		Image
		Drawing
		Video
		Audio
	Data Management	DBMS
		OODBMS
		Flat File
		Transaction Processing
Communications Services	**Distributed Services**	File Transfer
		E-mail
		EDI
		Remote Database Access
		Remote Procedure Call
		Remote Systems Administration
		Remote Configuration Management
		Network management
		Authorization
		Authentication
		Audit
	Interconnection	LAN
		Backbone
		MAN
		PSTN
		WAN

Figure 5-12 - Example IT Service List

Figure 5-12 is merely an example and not intended to be a definitive list of IT Services. When IT Services are derived for a particular User Organization OSE Profile, many of the IT Services will not be used. Additionally the user may have to add IT Services not shown.

Once all the IT Services have been identified, the generic IT Services models as shown in

Figure 4-8 can be developed.

5.6 Identify Standards, Technical Profiles and Interim Technologies (Physical Design Phase)

The next stage in the profile process is to populate the generic IT Service models. This requires determining the standard solutions and standard options that will promote the goals of interoperability and portability as well as the proprietary solutions that will need to be used for a period of time because of existing investment in technology and existing gaps in standard solutions.

Many sources can be used to identify existing and planned standards and profiles. For example, ISO/IEC 14252:1995 identifies some standards and technical profiles that provide the required IT Services.

Information on standards organizations and their products can often be found on the World Wide Web.

Other enterprises, such as the POSC have developed documents that specify the standards and profiles that they have decided to adopt for their particular requirements.

The decomposition of the BSRs into IT Services immediately reduces the set of standards that need to be considered for a User Organization OSE Profile.

Every interface, platform service, and interconnection service identified in each generic IT Service model must be populated. Occasionally gaps will appear where standards or SPs are not available. Depending upon the time-scale for delivery of the implemented profile, the choices are to

— Find an industry, proprietary, or emerging standard that addresses the need
— Find a product (commercially available implementation) that addresses the IT Service requirement
— Specify a solution to be built to fill the gap
— Delay implementation until a standard is in place

Each of the above options carries its own business risks. The option chosen will depend entirely upon the business approach of the concerned enterprise.

Selecting the appropriate standards to populate logical IT Service models is a matter of balance and compromise between the following:

— Interoperability with previously chosen standards
— Availability in product
— Fit with FQs (decomposed from the BSRs)

Thus the process of populating the logical IT Service models is iterative.

When a User Organization OSE Profile addresses a very large scope, it may well be appropriate to populate the logical models with different related sets of standards and emerging standards that address the short, medium, and long term. This approach aids transition planning.

Once the IT Services models have been populated as shown in Figure 4-9 and the cross references created (as shown in Figures 5-10 and 5-11), the profile is complete. The Technology Component models, fully defined in terms of their populated IT Services and their FQs can be used as procurement specifications. The populated IT Service models can be used as development and implementation specifications as well as guides to conformance testing.

5.7 Select Products (Operational Design Phase)

To take the physical design through to implementation requires a further stage to be added to the User Organization OSE Profile development process, that is, to turn the profile into products that can be purchased. The outputs of this process will be unique to each organization and will produce different results over time.

Sometimes products are not available that address the standard chosen or may not be currently compatible with other products selected. In this case the profile and requirements should be revisited as part of the iterative process.

The physical design (as described in 5.6) in terms of standards, populated IT Service models, and Technology Component models, needs to be implemented. It is of paramount importance that these models are fully populated before moving to the operational stage, thus ensuring interoperability for now and the future.

Product selection and integration are complicated especially if multiple applications have to coexist on the same platform. The selection of APIs and operating system is critical. See Section 7 for more information.

Figure 5-13 shows the types of inputs required and output generated at this stage

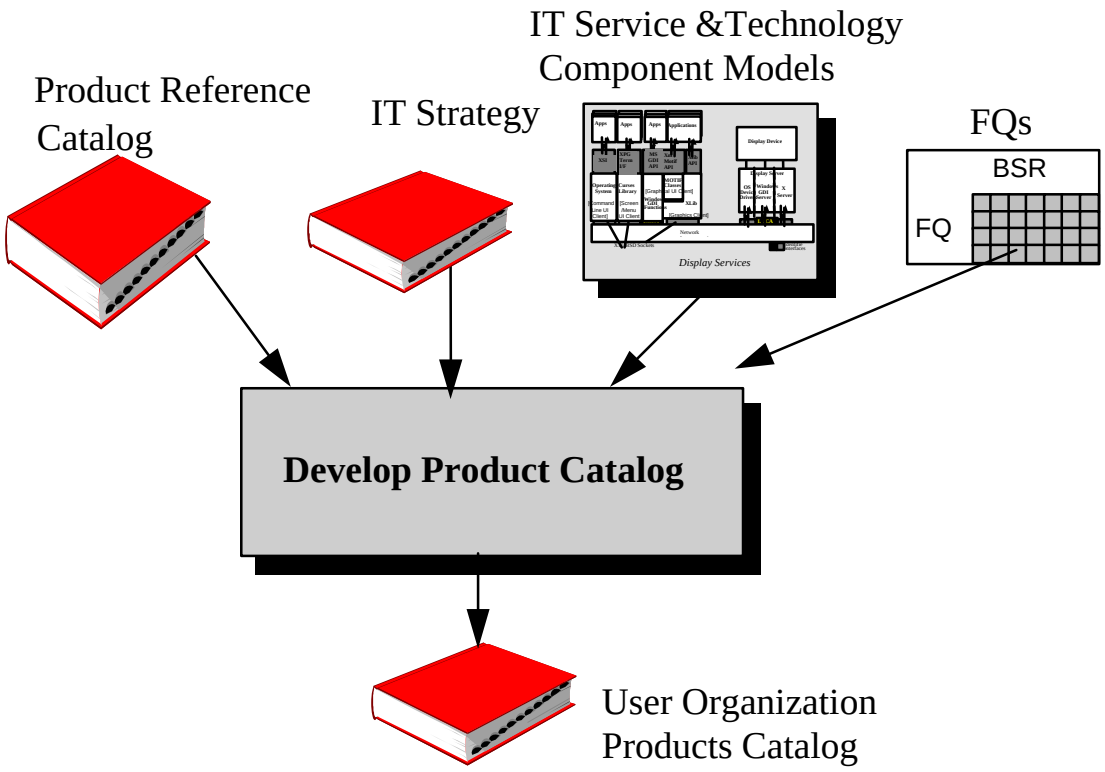


Figure 5-13 - Product Selection

The required inputs to be processed are

— Product Reference Catalog-a source of information on relevant, current, and emerging products and their development strategies
— The IT Strategy of the organization-documenting the product standards of the organization and third-party support and maintenance requirements
— The physical model of the User Organization OSE Profile
— BSR FQs-the performance requirements of the BSRs used to derive the profile, in terms of throughput, number of concurrent users, response times, database sizes, availability and security, etc.

Different products may be chosen to implement the same physical Technology Component depending upon the FQs of the IS Service(s) that the Technology Component will deliver in different domains in support of different BSRs.

The result of normalizing all of these inputs is to produce an organization-specific Products Reference Catalog. This catalog of products and suppliers should be considered as a short list for any procurement.

As the entire User Organization OSE Profile process is top-down from the business requirements to the technological solution in terms of products that can be implemented, the benefits are

— Reduction in both cost and time in the procurement process
— Ability to set-up long term relationships with vendors
— Leverage in the development of products
— Sound foundation for future new development and legacy system migration, guaranteeing maximum interoperability

Section 6: Suggested User Organization OSE Profile Outline

6.1 Suggested Outline

This guide describes the concept of an OSE profile; the process for developing, implementing and maintaining these profiles; and a discussion of the issues related to User Organization OSE Profiles. However, the task of developing an OSE Profile will be more readily understood and useful to a wide range of users if the profiles contain common elements in a common format.

The overall aim of this guide is to suggest one possible way of developing a User Organization OSE Profile. Although any form of profile presentation is equally as valid, the concepts in this guide should facilitate user organizations to be able to communicate in a common form and maximize the re-use of common elements while protecting both commercial or national security sensitive implementations, i.e., the operational designs.

A suggested User Organization OSE Profile outline is shown in Figure 6-1

1		Purpose of this User Organization OSE Profile;
2		Enterprise context;
3		Detailed User Organization OSE Profile;
	a	Profile scope;
	b	Requirements Analysis;
	c	Logical Design;
	d	Physical Design;
4		Summary and Lessons Learned

Figure 6-1 - Suggested User Organization OSE Profile Outline

6.1.1 Purpose of This User Organization OSE Profile

This section should contain the high-level business and technology drivers for the User Organization OSE Profile along with a statement of the current AS-IS challenges and the time-line TO-BE challenges that the profile is to address.

6.1.2 Enterprise Context for this User Organization OSE Profile

This section should contain a brief description of the "AS-IS" and "TO-BE" business/operational environment that this profile is to address.

6.1.3 Detailed User Organization OSE Profile

This section should detail the actual User Organization OSE Profile and its development process. If the recommendations contained within this guide have been used the stages and deliverables should follow the recommendations given in Sections 4 and 5.

6.1.3.1 Profile Scope

The business Scope that this User Organization OSE Profile addresses should be documented in as concise a form as possible: Venn diagrams, high-level flowcharts, IDEF[1] notation, or any other form of visually concise communication is acceptable.

6.1.3.2 Requirements Analysis

This section should document as visually as possible (see Annex B for examples) the BAs (domains) to be addressed within the scope of the profile in terms of

- The accepted/approved BSRs-documented as a BSR catalog, including FQs for each BSR
- The derived Information System (IS) Services - documented as an IS Service catalog
- A BSR/IS Service cross-reference matrix

6.1.3.3 Logical Design

This section should document the Logical Design of the User Organization OSE Profile in terms of

- Derived IT Services
- An IS Service/IT Service cross-reference matrix
- Logical Technology Component models
- Logical IT Service models
- Computing Environments-one for each BA (domain)
- Technology Framework-a high level diagram of the original scope in terms of the Technology Components to be deployed
- Any matrices relating IS/IT Services and Technology Components

6.1.3.4 Physical Design

[1] FIPS 183, Integrated Definition for Functional Modeling (IDEF0), IEEE P1320.1.1 IDEF0

This section should document the population of the Logical Design components in terms of profiles, PASs, and base standards as well as identifying gaps where no current or emerging standards exist. When two or more suitable standards can be used in a User Organization OSE Profile, the choice of the standard to use will depend upon its availability in product, its fit to the FQs and its compatibility with other standards chosen for that profile. A Standards Framework document could be used to describe the populated, logical IT Service and Technology Component models.

6.2 Examples

Examples of profiles that might be used by various disciplines are shown in Annex B. The profile examples are not meant to be complete documents that can be applied as is by user organizations. They are intended to provide some examples of the approach recommended in this guide for the development of a User Organization OSE Profile. These examples could be used to support a variety of types of user organizations that are concerned with the goals of increasing the interoperability and portability of the computer and communications technology that supports their operations.

Section 7: User Organization OSE Profile Issues

7.1 Conformance Testing

While a profile in and of itself is not a testable entity, the underlying infrastructure components are testable and the performance goals of the profile are measurable and therefore testable. The technical infrastructure of the profile is testable in both its accuracy of conformance to the pertinent standards and its ability to successfully address the enterprise/business/mission requirements in terms of the FQs.

In testing a claim that a particular implementation conforms to a User Organization OSE Profile, a systematic approach should be taken, for example,

— Testing individual claims of conformance to OSE base standards or specifications (Some or all of these claims may have been validated in a previous testing campaign.)
— Testing the aggregation of all the claims of conformance to OSE base standards or specifications

This latter case may require that many interactions have test cases (including coexistence, sharing resources, and mixing events) that may give rise to an unworkable number of tests being required. OSE platform profiles have been developed with conformity assessment testing in mind. However, testing would be restricted to observable behavior, which may be a subset of observable behavior defined in a base specification.

Conformance testing per se does not guarantee interoperability; it is only a test of conformance to a set of test assertions based on the standard. One way to measure conformance is to develop a reference implementation of the particular standard or standardized profile, as shown in Figure 7.1.

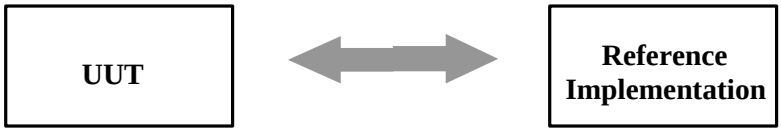


Figure 7-1 - Conformance Testing

The UUT then is "exercised" through the use of test scripts. The behavior of the UUT is monitored and compared with the expected outcome from the reference implementation. The advantage of this approach is that many vendor products can be tested, thus spawning competition. If a reference implementation is not available, other conformance test methods could be used, such as software unit testing, software qualification testing, and integrated hardware/software testing.

Although conformance testing does not ensure interoperability, such inter-working would be virtually impossible without conformance to standards. Interoperability testing, as shown in Figure 7-2, is a matter for vendors and users, rather than standards setting organizations.

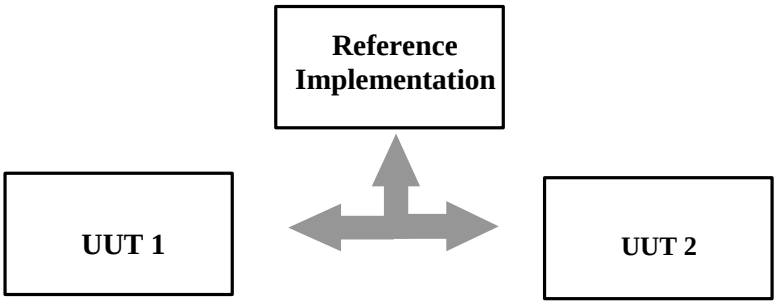


Figure 7-2 - Interoperability Testing

Many current standards have registered conformance tests. The JTC1 administers an index of registers of conformance tests that is generally available. When a product is found on such a registry, it can be assumed that it has "passed" a battery of test procedures. The availability of test registries greatly simplifies the hardware/software qualification testing of a system, thus saving time and money for the developer.

7.2 Implementation Issues

Once a User Organizational OSE Profile has been developed, it is still necessary to document the implementation conventions associated with each of the selected standards and/or specifications. This final step is required to prevent interoperability problems.

As an example SQL, (ISO 9075:1992 as profiled by FIPS 127-2) has four levels of conformance test depending upon the set of calls being used. When using different RDBMS products, all the products may not support the same set of calls. Equally most products contain extra proprietary features and extensions over and above base level standard conformity. Use of such "super-set" features and extensions should be avoided if interoperability is the goal. If they cannot be avoided, their use should be carefully documented in each application. In addition, users should consider "masking off" nonstandard code. This programming technique isolates a nonstandard function via an interface.

7.3 Transition Planning

After a user organization develops an OSE Profile, it is important to have a plan for implementing the profile. Obviously, upper-level management will need to establish priorities for implementing the various parts of the profile. If technical support personnel are directed to implement an entire User Organization's OSE Profile without being given direction on the priorities of user management and the time frames for implementing various parts of the profile, then it is unlikely that the portability and interoperability requirements that are implemented first will be the areas that are most important to management.

Implementing a profile according to the goals of the user organization will be facilitated if the key interoperability goals are clearly documented in the profile. The actual transition plan can be an annex to the User Organization OSE Profile or it can be a separate document. The profile transition plan should be a living document and should be updated as the profile is implemented and as the goals of management change.

7.4 Using PASs

PASs are specifications (e.g., industry profiles, *de facto* standards) that have been developed outside the approved process for open standards. For the purpose of this guide, PASs are widely implemented and the documentation is available in the public domain. Examples of widely used PASs are the RFCs and standards from IETF. The JTC1 has recognized two procedures for incorporating PASs into ISPs. The first is to reference the PAS directly; the second is to convert the PAS into a formal standard and then reference that formal standard.

Section 8: Benefits of User Organization OSE Profiles

The advent of open systems has uncovered a communications problem-that of translating high-level user requirements into technical solutions that meet those requirements. Twenty years ago when technology was in the driving seat, it was the vendors of technology that drove the process; and business systems and business processes were fabricated to fit the existing technology. With the advent of open systems, the technology exists to solve any and all business requirements. Developing a business system solution is just a matter of articulating what is needed and organizing its supply, i.e., fitting the technology to the business requirements. This has highlighted a communications chasm. User organizations tend to articulate their needs in business terms, while technology solution vendors describe their solutions in technical terms. The two sides of the requirements/solution equation expend too much time and money in attempting to relate a business need to a technological solution and vice versa. This is particularly true when the business need requires a multiple supplier (and, therefore, integrated) technology solution to support an integrated business process.

A summary of the User Organization OSE Profile development process is shown in Figure 8-1.

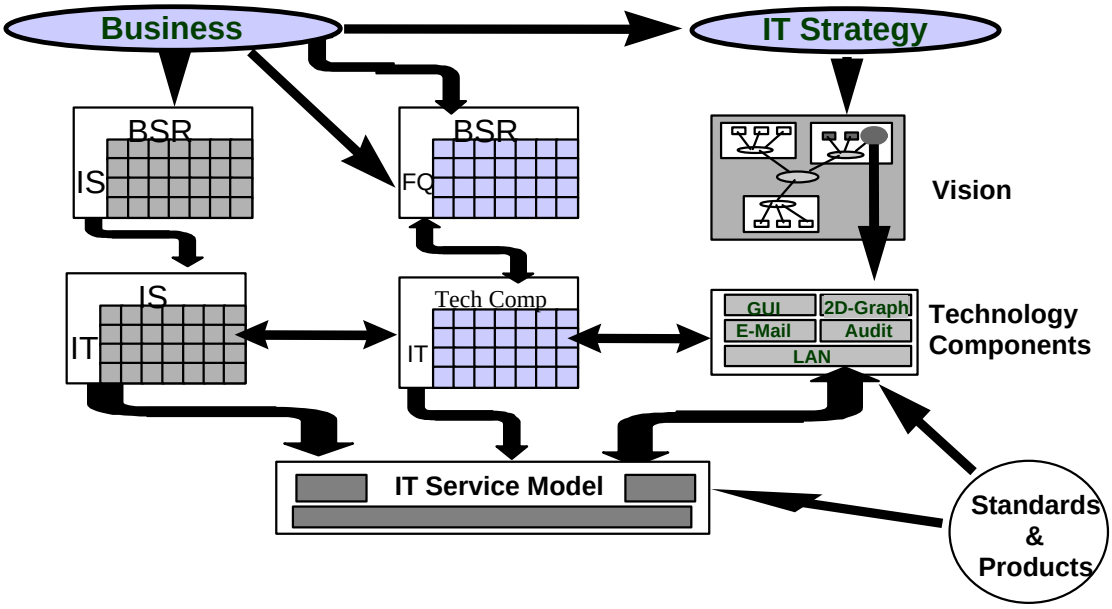


Figure 8-1 - User Organization OSE Profile Process Summary

The benefits of User Organization OSE Profiles are that they address the above problems and provide

- Better communication-Now a direct link exists from the business need (BSR) to the technical solution (the populated IT Service models and the Technology Component models). Both business management and information technologists, although using different languages, are describing the same overall business needs as the OSE Profile is developed top-down from the business requirements.

- Easier procurement-User Organization OSE Profiles facilitate the business users to express exact needs in technical terms to their potential sources of supply. Thus the requirements/solution process is shortened, and overall cost is reduced.

- Easier overall integration-As User Organization OSE Profiles are developed top-down from the overall business need, technical interoperability and business process integration are built into the solution as a natural consequence of populating the logical IT Service models and Technology Component models completely with standards before moving on to the next stage.

- Business-related service levels-With User Organization OSE Profiles, the Technology Components are specified not only in terms of what they must support from the business viewpoint but also in terms of how this support will be delivered by the technology. Thus conformance to the technical requirements and business performance testing can be specified prior to any procurement.

- Protection of investment-By populating the profile with OSE standards and technical profiles, a User Organization OSE Profile can naturally address the requirements of portability and scalability.

- Feedback loop into the standards process-By identifying at an early stage gaps where standards and profiles do not yet exist to address the identified interface needs of generic IT Service models, the business community, the standards setting bodies and the suppliers of IT have a mechanism for maximizing the return on investment made in researching and developing new standards and profiles leading to a quicker time to market.

- Feedback loop into the product development process-By developing User Organization OSE Profiles top-down from the business requirements, users of technology can help drive the technology developments of vendors in line with the business requirements of the users.

Annex A: Bibliography (informative)

{B1} EWOS EG-OSE, *Method for Developing and Documenting OSE Profiles,* draft, April 1993.

{B2} British Standards Institute, *Framework for User Requirements,* draft, 1992

{B3} ISO/IEC 10000: 1995, *Framework and Taxonomy of International Standardized Profiles*— Parts 1-3.

{B4} Mikulis, Marisé, *White Paper on the Petrotechnical Open Software Corporation (POSC) Base Computer Standards,* draft, Jan 13, 1995.

{B5} EWOS EG-OSE, *Development and Use of OSE Profiles,* January 26, 1995.

{B6} POSC, *Base Computer Standards,* Englewood Cliffs, NJ, Version 2.0, Prentice-Hall P T R, 1995.

{B7} Mikulis, Marisé, *Standard Sense, How You and Your Organization Can Benefit from the POSC Software Integration Platform, Base Computer Standards,* Version 2.0, Houston, TX, POSC, 1995.

{B8} CAP Gemini Sogeti, *Architecture Development Method,* April 7, 1995.

{B9} Severence, Chuck, "What is a profile?" IEEE Computer Magazine, September 95.

{B10} Digital, *Open Systems Handbook: A Guide to Building Open Systems,* "Applying Open Systems Information to Your Business," Digital Equipment Corporation, pp 5-1 through 5-13, 1991.

{B11} Quarterman and Wilhelm, *UNIX, POSIX, and OPEN SYSTEMS: The Open Systems Standards Puzzle,* Reading, MA, Addison-Wesley, 1993.

{B12} Isaak, Lewis, Thompson, and Straub, *OPEN SYSTEMS HANDBOOK, A Guide to Building Open Systems,* IEEE Standards Press, 1994.

{B13} Ward, Griffiths, and Whitmore, *STRATEGIC PLANNING FOR INFORMATION SYSTEMS,* West Sussex P019 1UD, England, John Wiley & Sons, 1990.

{B14} Rauch, Wendy, DISTRIBUTED OPEN SYSTEMS ENGINEERING, John Wiley & Sons, 1996.

{B15} EWOS, *EWOS Technical Guide on OSE Profile Conformance Testing,* November 13, 1995.

{B16} Cross-Industry Working Team (XITW), Class *Profiles for the Current and Emerging NII*, Corporation for National Research Initiatives, April 1997.

Annex B: User Organization OSE Profiles Examples (informative)

This guide describes the concept of an OSE Profile; the process for developing, implementing, and maintaining these profiles; and provides a discussion of issues related to User Organization OSE Profiles. However, the task of developing an OSE Profile that will be readily understood and useful to a wide range of users will be greatly simplified if profiles contain common elements in a common format. The profile samples that follow are not meant to be complete documents that can be used by user organizations. They are intended to provide some examples of OSE Profiles that could be developed to support a variety of different types of user organizations that are concerned with the goals of increasing the interoperability and portability of the computer and communications technology that supports their operations. This annex contains the following example profiles at the logical level:

B.1 Banking OSE Prototype Profile
B.2 Industry (Petrochemical) OSE Prototype Profile

As the above are examples of User Organization OSE Profiles, the physical level has been consolidated as the Standards Frameworks, the Technology Components, and IT Service models in the following subsections:

B.3 Physical Design (Standards Frameworks)
B.4 Technology Components
B.5 IT Service Models

B.1 Banking OSE Prototype Profile (First Galaxy Bank)

B.1.1 Purpose

The purpose of this profile is to address the needs and wants of a major worldwide retail bank in the attainment of its goals for a specific set of business requirements. These requirements include providing global account positioning to be made available to all international customers and the spread of knowledge and best practices across the world-wide customer support organization. In the short term this investment should facilitate the handling of the ECU and in the long term form a platform for image-based trading and Internet banking. This profile is, therefore, BA strategic rather than enterprise-wide strategic.

B.1.2 Enterprise Context

First Galaxy bank operates as separate retail banks in over 50 countries around the world. Currently operation in each country is entirely separate and autonomous. Customers may have accounts in more than one country and currently it is not easy to obtain the live balance of an account in another country. Equally, local knowledge is not easily available in another country and no collated marketing information exists on global customers as they are treated as individual entities in each country.

Two of the main business drivers for this development are to provide

— A single view of the bank (same in all countries) for its customers
— A single view of the customer from all countries

B.1.3 Scope

From a business viewpoint this profile should address three different sets of BAs:

— Global account positioning and interfaces to country (legacy) systems
— Marketing services (including three regional call centers)
— Knowledge services to support country-based and international operations

These BAs are shown as geographically separate businesses in Figure B-1.

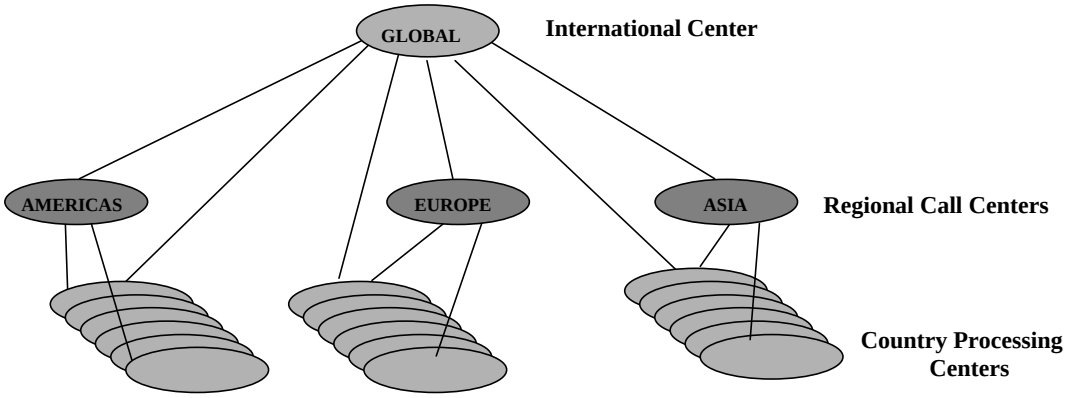


Figure B-1 - Banking Profile, Geographic Functions (Technology Framework)

B.1.4 Requirements Analysis

The BSRs for each of the BAs are documented in Figure B-2.

	INTERNATIONAL CENTER	
1.	Access to Global Account Positions	The ability for both First Galaxy Bank staff and certain nominated customers to have access to global account positions 24 hours per day.
2.	Access to Global Knowledge	The ability for both First Galaxy Bank staff and certain nominated customers to have access to global knowledge services detailing bank products and services and global information.
3.	Marketing Knowledge	The ability to generate specifically targeted products and services from the global knowledge obtained on international customers.
	REGIONAL CALL CENTERS	
4.	Call Support	The ability to access up-to-date account information for any calling customer.
5.	Knowledge Support	The ability to access up-to-date global, regional, and/or country-based information in support of a call.
6.	Job Support	The ability to follow best First Galaxy Bank practices throughout a call.
	LOCAL PROCESSING CENTERS	
7.	Knowledge Support	The ability to access up-to-date global, regional, and/or country-based information in support of local work.
8.	Job Support	The ability to follow best Galaxy Bank practices.
	INFRASTRUCTURE	
9.	Improved and Standardized Communications	The ability to send and receive electronic communications both internally and externally.
10.	Centralized Governance and Control	The ability to manage and control the entire infrastructure for global services from a single point.

Figure B-2 - Banking Profile BSR Catalog

The BSR/IS Service cross-reference is shown in Figure B-3.

	International Call Center			Regional Call Center			Processing Center		Infrastructure	
	1	2	3	4	5	6	7	8	9	10
Business System Requirements	Global Account Positions	Global Knowledge	Marketing Knowledge	Call Support	Knowledge Support	Job Support	Knowledge Support	Job Support	Standardized Communication	Centralized Governance
IS Services										
Office Automation				**Y**		**Y**		**Y**	**Y**	
Database Management	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**
Decision Support			**Y**			**Y**		**Y**		
Transaction Processing	**Y**		**Y**	**Y**		**Y**		**Y**		**Y**
Image Processing										
Knowledge Processing		**Y**	**Y**		**Y**		**Y**			
Desktop Publishing		**Y**	**Y**		**Y**		**Y**			
Electronic Messaging	**Y**	**Y**			**Y**		**Y**			**Y**
Hypermedia Processing		**Y**			**Y**		**Y**			
Computer Conferencing		**Y**	**Y**	**Y**	**Y**		**Y**		**Y**	**Y**
Computer Integrated Telephony				**Y**		**Y**		**Y**		

Figure B-3 - Banking Profile BSR/IS Service Cross-reference

A description of each IS Service is given in the IS Service Catalog shown in Figure B-4.

IS Service	
Office Automation	Services that support the production and storage of documents, diagrams, and matrices by individual users.
DB Management	Services that support the storage, management, and retrieval of data (text and graphics) that are sharedshared user data (text and graphics).
Decision Support	Services that support the end-user analysis of stored data.
Transaction Processing	Services that support access to the same application and DB by multiple users simultaneously.
Image Processing	Services that support the scanning, storage, and retrieval of images.
Knowledge Processing	Services that support rules-based processing.
Desktop Publishing	Services that enable text-based documents to be output as printable text in different fonts and associated graphics.
Electronic Messaging	Services that support the transfer to messages (text and file attachments) between users.
Hypermedia Processing	Services that support the production and output of mixed audio and visual data.
Computer Conferencing	Services that support the on-line communication of text between many users.
Computer-Integrated Telephony	Services that support the interfacing of telephony services with computer data retrieval, including voice response and workflow.
Workflow	Services that support the intercommunication between remote services that correspond to a known set of business rules.

Figure B-4 - Banking Profile IS Service Catalog

B.1.5 Logical Design

The derived IT Services of the banking OSE Profile have been taken from the list shown in Figure 5-12 and are displayed as an IT/IS Services cross-reference in Figure B-5.

OSE Service Group	**Human Computer Interface Services**											**System Services**							**Information Services**										**Communication Services**																		
IT Service Group	Presentation							Input				Processing			Local Services				Data Interchange						Database					Distributed Services														Inter - connection			
IT Service	GUI	2D Graphics	3D Graphics	Character	Video	Audio		Character	Drawing	Video	Audio	Multi-tasking	Multi-processing	Real Time	E-Mail	Printing	File Sharing	System Admin.	Record	Text	Image	Drawings	Video	Audio	DBMS	ODBMS	Flat File	Trans. Processing		File Transfer	E-Mail	EDI	Remote DB Access	RPC	Remote System Admin.	Remote Config. Mgmt.	Network Management	Authentication	Authorisation	Audit		LAN	Back Bone	PSTN	WAN
IS Services																																												
Office Automation	**Y**	**Y**		**Y**				**Y**				**Y**	**Y**		**Y**	**Y**	**Y**	**Y**		**Y**	**Y**						**Y**					**Y**	**Y**	**Y**	**Y**	**Y**	**Y**		**Y**		**Y**	
Database Management		**Y**		**Y**				**Y**				**Y**	**Y**			**Y**	**Y**	**Y**	**Y**	**Y**					**Y**	**Y**				**Y**		**Y**	**Y**		**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**			
Decision Support		**Y**		**Y**				**Y**				**Y**	**Y**			**Y**	**Y**	**Y**	**Y**	**Y**					**Y**	**Y**	**Y**			**Y**					**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**			
Transaction Processing				**Y**				**Y**				**Y**	**Y**			**Y**	**Y**	**Y**	**Y**	**Y**					**Y**	**Y**	**Y**	**Y**				**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**		**Y**	
Image Processing	**Y**	**Y**	**Y**					**Y**	**Y**			**Y**	**Y**			**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**			**Y**					**Y**			**Y**		**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**			
Knowledge Processing				**Y**				**Y**				**Y**	**Y**			**Y**	**Y**	**Y**	**Y**	**Y**					**Y**			**Y**		**Y**			**Y**		**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**		**Y**	
Desktop Publishing	**Y**	**Y**		**Y**				**Y**	**Y**			**Y**	**Y**			**Y**	**Y**	**Y**	**Y**	**Y**	**Y**				**Y**		**Y**			**Y**			**Y**		**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**			
Electronic Messaging				**Y**				**Y**				**Y**	**Y**		**Y**	**Y**	**Y**	**Y**	**Y**	**Y**						**Y**			**Y**	**Y**	**Y**			**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**		**Y**	
Hypermedia Processing	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**		**Y**	**Y**	**Y**	**Y**	**Y**	**Y**			**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**			**Y**			**Y**		**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**			
Computer Conferencing	**Y**	**Y**		**Y**				**Y**				**Y**	**Y**		**Y**	**Y**	**Y**	**Y**	**Y**	**Y**						**Y**	**Y**	**Y**		**Y**				**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**		**Y**	
Computer Integrated Telephony	**Y**					**Y**		**Y**			**Y**	**Y**	**Y**	**Y**			**Y**	**Y**		**Y**				**Y**			**Y**	**Y**	**Y**			**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**
Workflow	**Y**							**Y**	**Y**			**Y**	**Y**		**Y**	**YY**		**Y**	**Y**	**Y**					**Y**	**Y**	**Y**	**Y**		**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**		**Y**		**Y**	**Y**

Figure B-5 - Banking Profile IS/IT Services Cross-Reference

The Technology Components associated with this profile are referenced in the computing environments shown in Figure B-6 and documented in Figure B-7. The Standards Framework shown in B.3 supports these components. They are shown in detail in B.4 and the IT Service models are shown in B.5.

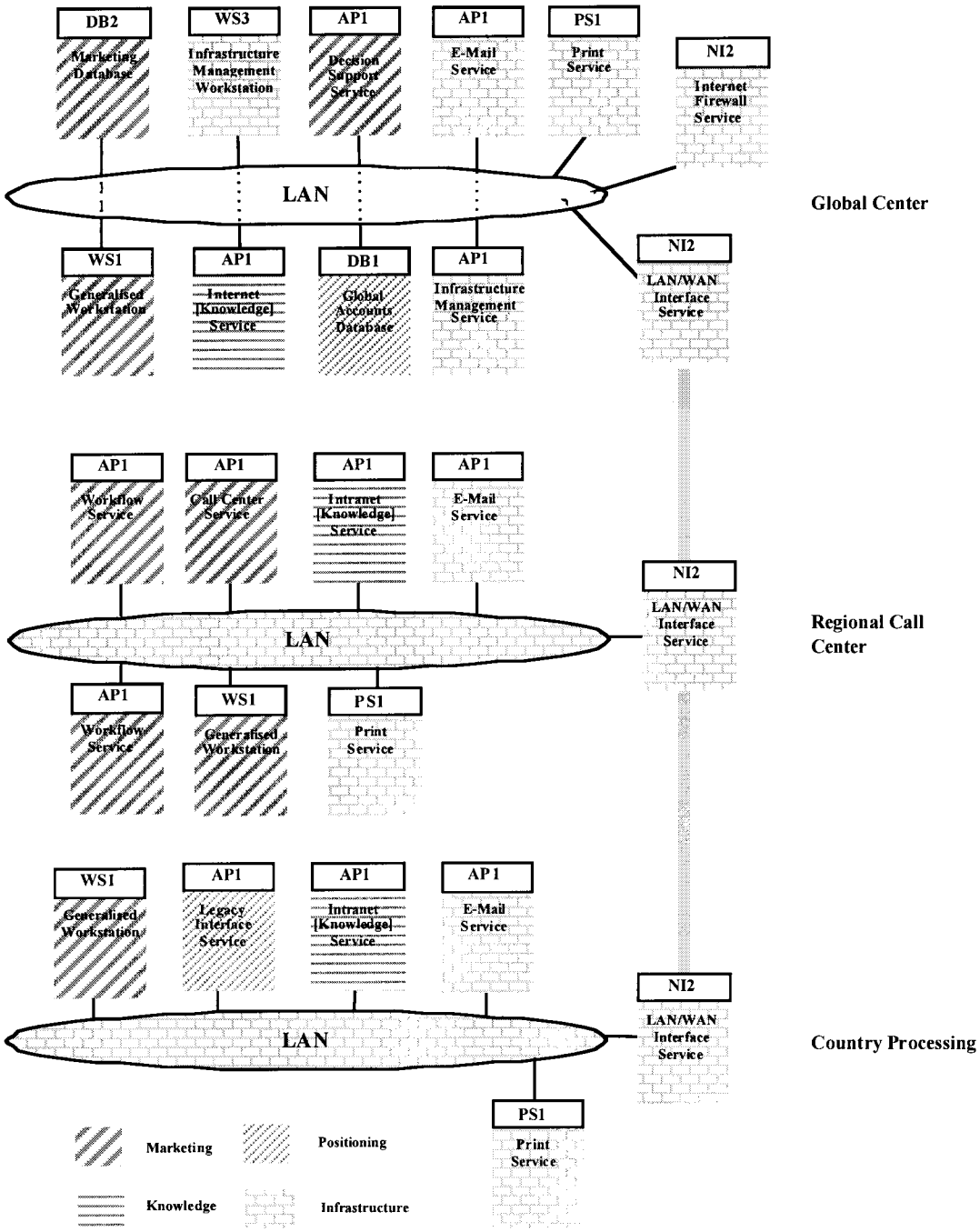


Figure B-6 - Banking Profile Computing Environments

	Technology Component Description
NI2	NI Service for interconnecting the LAN with the WAN, and supporting an Internet firewall.
AP1	Generalized Application Service for infrastructure management and e-mail, etc.
WS1	Generalized WS for supporting the application server clients.
WS3	Specialized WS for infrastructure management.
PS1	Generalized Printing Service.
DB1	Generalized DB Service for RDBMSs.
DB2	DB Service for data warehousing.

Figure B-7 - Banking Profile Technology Component Description

B.2 Petrochemical OSE Prototype Profile (Royds Lubricants)

B.2.1 Purpose

The purpose of this profile is to address the needs and wants of a petrochemical company in the attainment of its goals for a specific set of business requirements. Royds is a vertically integrated oil company with business operations ranging from exploration and production to refining and distribution. The purpose of this profile is to address the needs of the refining operation that wishes to fully integrate its administrative and technical services with the process control functions in the refining operation.

B.2.2 Enterprise Context

In functional breakdown the refining operation of Royds is shown in Figure B-8,

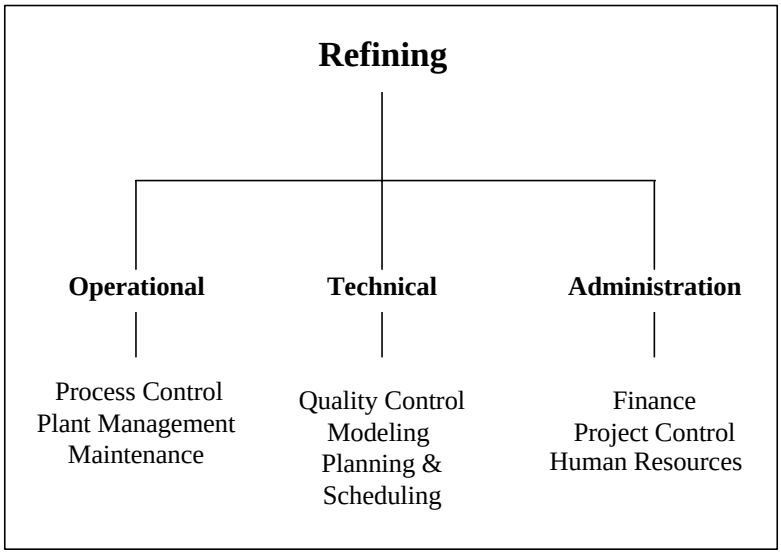


Figure B-8 - Royds Refining Operation

The major drivers for the new profile are

- The ability to model, plan and schedule on real-time data
- To improve quality control
- To reduce manning and maintenance costs

B.2.3 Scope

The scope of the OSE Profile will address the technical and administrative requirements and interface with the existing real-time process control systems in the operational environment.

B.2.4 Requirements Analysis

The BSRs for each of the BAs are documented in Figure B-9.

	Administration	
1.	Finance	Sales, purchase, and general ledger storage with update, inquiry, and reporting capabilities.
2.	Project Control	Project costing; resource control and management system.
3.	Human Resources	Roster planning with update, inquiry, and reporting capabilities.
	Technical	
4.	Quality Control	Data storage, update, inquiry, and reporting of automated laboratory analysis systems.
5.	Modeling	Capacity modeling of plant processes based on real-time process control data.
6.	Planning and Scheduling	Production planning and scheduling.
	Operational	
7.	Interface to Automated Refinery Operations	A real-time manager of managers for process control data gathering and transfer to the Administration and Technical services.

Figure B-9 - Petrochemical Profile BSR Catalog

The BSR/IS Service cross-reference is shown in Figure B-10.

Business System Requirements	Finance	Project Control	Human Resources	Quality Control	Modeling	Planning & Scheduling	Interface to Refinery Automation
IS Services							
Office Automation	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	
Database Management	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**
Decision Support		**Y**	**Y**	**Y**	**Y**	**Y**	
Transaction Processing	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**
Process Control							**Y**
CAD/CAM					**Y**	**Y**	
Image Processing			**Y**		**Y**		**Y**
Statistical Analysis					**Y**		
Knowledge Processing		**Y**		**Y**	**Y**	**Y**	
Desktop Publishing					**Y**	**Y**	
Electronic Messaging				**Y**	**Y**		
Hypermedia Processing					**Y**		**Y**
Computer Conferencing					**Y**		
Video Conferencing	**Y**		**Y**	**Y**		**Y**	

Figure B-10 - Petrochemical Profile BSR/IS Service Cross-Reference

The IS Service Catalog for Royds is shown in Figure B-11.

IS Service	
Office Automation	Services that support the production and storage of documents, diagrams, and matrices by individual users.
DB Management	Services that support the storage, management, and retrieval of shared user data (text and graphics).
Decision Support	Services that support the end-user analysis of stored data.
Transaction Processing	Services that support access to the same application and database by multiple users simultaneously.
Process Control	Services that support the real-time input and output of data to manufacturing control devices.
CAD/CAM	Services that support the automated manufacture of products.
Image Processing	Services that support the scanning, storage and retrieval of images.
Statistical Analysis	Services that support the intensive processing of mathematical data.
Knowledge Processing	Services that support rules based processing.
Desktop Publishing	Services that enable text based documents to be output as printable text in different fonts and associated graphics.
Electronic Messaging	Services that support the transfer to messages (text and file attachments) between users.
Hypermedia Processing	Services that support the production and output of mixed audio and visual data.
Computer Conferencing	Services that support the on-line communication of text between many users.

Figure B-11 - Petrochemical Profile IS Service Catalog

B.2.5 Logical Design

The derived IT Services of the petrochemical OSE Profile have been taken from the list shown in Figure 5-12 and are displayed as an IT/IS Services cross-reference in Figure B-12.

OSE Service Group	**Human Computer Interface Services**										**System Services**							**Information Services**										**Communication Services**																			
IT Service Group	Presentation						Input				Processing				Local Services			Data Interchange						Database				Distributed Services																Intercon-nection			
IT Service	GUI	2D Graphics	3D Graphics	Character	Video	Audio	Character	Drawing	Video	Audio	Multi-tasking	Multi-processing	Real Time	Super-computing	E-Mail	Printing	File Sharing	System Admin.	Record	Text	Image	Drawings	Video	Audio	DBMS	ODBMS	Flat File	Trans. Processing	File Transfer	E-Mail	EDI	Remote DB Access	RPC	Remote System Admin.	Remote Config. Mgmt.	Network Management	Authentication	Authorisation	Audit	LAN	Back Bone	MAN	WAN
IS Services																																												
Office Automation	**Y**	**Y**		**Y**			**Y**				**Y**	**Y**			**Y**	**Y**	**Y**	**Y**		**Y**	**Y**						**Y**					**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**					
Database Management		**Y**		**Y**			**Y**				**Y**	**Y**				**Y**	**Y**	**Y**	**Y**	**Y**					**Y**	**Y**			**Y**		**Y**	**Y**		**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**			
Decision Support		**Y**		**Y**			**Y**				**Y**	**Y**				**Y**	**Y**	**Y**	**Y**	**Y**					**Y**	**Y**	**Y**		**Y**			**Y**		**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**			
Transaction Processing				**Y**			**Y**				**Y**	**Y**				**Y**	**Y**	**Y**	**Y**	**Y**					**Y**	**Y**	**Y**	**Y**			**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**
Process Control	**Y**	**Y**	**Y**	**Y**		**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**			**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**			**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	
CAD/CAM	**Y**	**Y**	**Y**	**Y**		**Y**	**Y**	**Y**			**Y**	**Y**																																	
Image Processing	**Y**	**Y**	**Y**				**Y**	**Y**			**Y**	**Y**				**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**			**Y**				**Y**			**Y**		**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**			
Statistical Analysis	**Y**	**Y**	**Y**	**Y**	**Y**		**Y**		**Y**		**Y**	**Y**		**Y**		**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**		**Y**		**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	
Knowledge Processing				**Y**			**Y**				**Y**	**Y**				**Y**	**Y**	**Y**	**Y**	**Y**					**Y**			**Y**	**Y**			**Y**		**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**			
Desktop Publishing	**Y**	**Y**		**Y**			**Y**	**Y**			**Y**	**Y**				**Y**	**Y**	**Y**	**Y**	**Y**	**Y**				**Y**		**Y**		**Y**			**Y**		**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**			
Electronic Messaging				**Y**			**Y**				**Y**	**Y**			**Y**	**Y**	**Y**	**Y**	**Y**	**Y**							**Y**		**Y**	**Y**	**Y**			**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**
Hypermedia Processing	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**				**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**			**Y**	**Y**	**Y**			**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**				
Computer Conferencing	**Y**	**Y**		**Y**			**Y**				**Y**	**Y**			**Y**	**Y**	**Y**	**Y**	**Y**	**Y**							**Y**	**Y**	**Y**			**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**
Video Conferencing	**Y**				**Y**	**Y**	**Y**		**Y**	**Y**	**Y**	**Y**	**Y**			**Y**	**Y**	**Y**			**Y**		**Y**	**Y**			**Y**	**Y**	**Y**				**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**

Figure B-12 - Petrochemical Profile IS/IT Service Cross-Reference

The Technology Components associated with this profile are referenced in the computing environments shown in Figure B-13 and documented in Figure B-14. The Standards Framework shown in B.3 supports these components. They are shown in detail in B.4 and the IT Service models are shown in B.5.

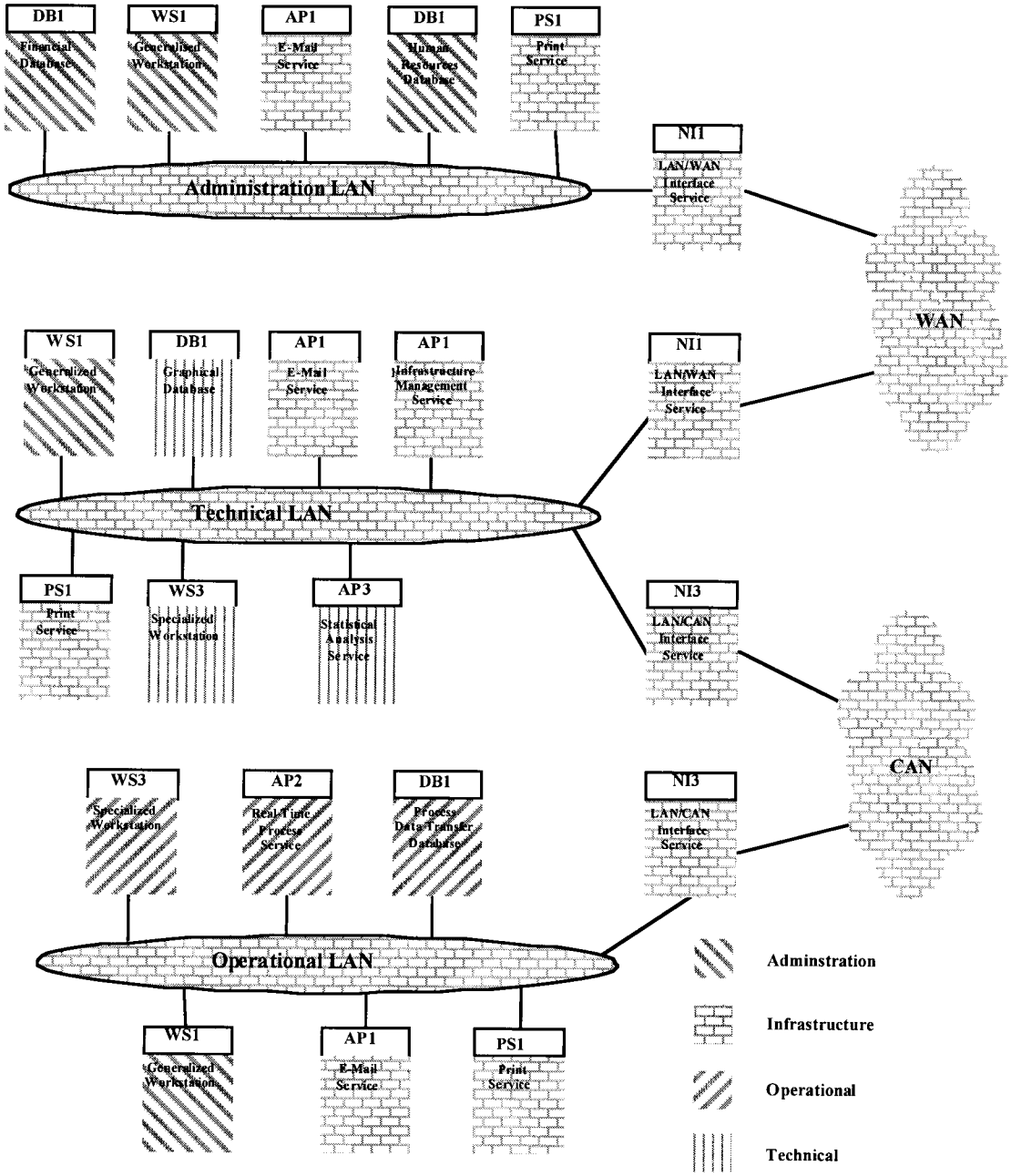


Figure B-13 -Petrochemical Profile Computing Environments

	Technology Component Description
NI1	NI Service for interconnecting the LAN with the WAN.
NI3	NI Service for interconnecting the LAN to a CAN or MAN.
AP1	Generalized Application Service for infrastructure management and e-mail, etc.
AP2	Real-time processing application server for management of lower level (existing) process controllers.
AP3	Supercomputing server for statistical analysis.
WS1	Generalized WS for supporting the application server clients.
WS3	Specialized WS for graphic modeling and infrastructure management.
PS1	Generalized Print Service.
DB1	Generalized DB Service for RDBMSs.

Figure B-14 - Petrochemical Profile Technology Component Descriptions

B.3 Physical Design (Standards Framework)

The physical design of all the OSE Profiles comprises the Standards Framework as shown in Figure B-15, the Technology Components as shown in B.4 and the populated IT Service models as shown in B.5.

IT Service	Technology Component Cross-reference	Standard	Comments
APPLICATIONS			
Office Automation	WS1,3	***GAP*** [1](OLE)	*Microsoft Office®.*
HCI			
GUI	WS1,4	***GAP*** (Win32 API)	Window Management & Graphics Device Interface, Volume 1 Microsoft Win32 Programmers reference manual, 1993, Microsoft Press.
	WS3	X-Windows System	X-Windows Systems XIIR5.
		Motif 1.2	OSF/Motif Application Environment Specification (AES), Release 1.2, 1992.
		ICCCM	OSF/Motif Inter-Client Communications Convention Manual.
	WS1,3,4	***GAP*** (CDE)	X/Open C323 Common Desktop Environment (CDE) Version 1.0, April 1995.
2D Graphics	WS1,3,4	GKS	ISO/IEC 7942-1: 1994 as profiled by FIPS Pub 120-1 (change notice 1): 1991, Graphical Kernel System (GKS) Software Standard— for 2D graphics.
3D Graphics	WS3,4	PHIGS	ISO 9592: 1989 as profiled by FIPS Pub 153, Programmer's Hierarchical Interactive Graphics Systems (PHIGS).
		CGI	ISO/IEC 9636: 1991, Information Technology—Computer Graphics Interfacing (CGI) Techniques for Dialogues with Graphics Devices.

Figure B-15 - Generalized Standards Framework

[1] The term *GAP* is used to indicate IT Service requirements for which no current OSE standards exist. The inclusion of a product in these examples is for illustration only and does not indicate endorsement of that software product.

IT Service	Technology Component Cross-reference	Standard	Comments
Video	VTC	***GAP*** (VTC001)	Industry Profile for Video TeleConferencing, Revision 1, April 25, 1995.
	WS3	ITU-T H.324 = 1998	Terminal for low bit rate multimedia communication, March 19, 1996.
Audio	VTC	***GAP*** (VTC001)	Industry Profile for Video TeleConferencing, Revision 1, April 25, 1995.
	WS3	ITU-T H.324 = 1998	Terminal for low bit rate multimedia communication, March 19, 1996 plus MIDI.
Character	WS1,3,4	ASCII	ISO/IEC 646: 1991.
Drawing	WS1,3,4	IGES	FIPS Pub 177:1992.
SYSTEM SERVICES			
Multi-Tasking	WS1, NI1, NI2, NI4	***GAP*** (Win32 API)	Window Management and Graphics Device Interface, Volume 1 Microsoft Win32 Programmers reference manual, 1993, Microsoft Press.
Multi-Processing	W,3 AP1, DB1,2, VTC	ISO/IEC 9945-1: 1996	Information Technology—Portable Operating System Interface for Computing Environments (POSIX) —Part 1: System Application Program Interface (API) [C Language], 1996 (E).
		ISO/IEC 9945-2: 1993	Information Technology—Portable Operating System Interface for Computing Environments (POSIX) —Part 2: Shell and Utilities, as profiled by FIPS Pub 189: 1994.
		IEEE Std 1003.2d: 1994	IEEE Standard for Information Technology—Portable Operating System Interface (POSIX®)—Part 2: Shell and Utilities—Amendment 1: Batch Environment.

Figure B-15 (continued) - Generalized Standards Framework

IT Service	Technology Component Cross-reference	Standard	Comments
Real Time	AP2	IEEE Std 1003.13: 1998	IEEE Standard for Information Technology—Standard Application Environment Profile (AEP)—POSIX®Realtime Application Support
		ISO/IEC 9945-1: 1996	POSIX—Part 1: System Application Program Interface (API) Amendment 1; Real-Time Extension [C Language], 1993, as profiled by FIPS Pub 151-2: 1993.
		ISO/IEC 9945-2: 1996	POSIX—Part 1: System Application Program Interface (API) Amendment; Technical Corrigenda to Real-Time Extension [C Language], 1995.
		ISO/IEC 9945-1: 1996, Threads Option	POSIX - Part 1: System Application Program Interface (API) Amendment 2; Threads Extension [C language], 1995.
Supercomputing	AP3	IEEE Std 1003.10:1995	POSIX Supercomputing Profile.
File Sharing	AP1, WS1,3,4, DB1,2	***GAP*** (OSF/DCE NFS)	Network File System.
Printing	WS1,2,3,4, PS1	***GAP*** (Postscript)	
INFORMATION SERVICES			
Record	NI1,2,3,4 AP1, WS1,3,4, DB1,2	***GAP***	Application Specific.
Text		ASCII	ISO/IEC 646: 1991
Document		ISO/IEC 8879: 1986	Standard Generalized Markup Language (SGML).
		RFC-1866	Hypertext Markup Language (HTML) Internet Version 2.0, 1995.

Figure B-15 (continued) - Generalized Standards Framework

IT Service	Technology Component Cross-reference	Standard	Comments
Image	AP1, WS1,3,4, DB1,2	ISO/IEC 8632-1,2,3,4: 1992	Computer Graphics Metafile (CGM) - Interchange format for vector graphics as profiled by FIPS Pub120-1: 1993.
		ISO/IEC 10918-1: 1994	Joint Picture Expert Group (JPEG), File Interchange Format (JFIF), Version 1.02, C-Cube Microsystems for raster graphics data: 1994.
Video and Audio	W,3 DB1,2, VCT	ISO/IEC 11772-1,2,3: 1993	Encoding of moving pictures and associated audio for digital storage media at up to 1.5 Mbits/s.
		ISO/IEC 13818-1,2,3: 1996	Generic Coding of Moving Pictures and Associated Audio Information.
DBMS	DB1,2	ISO/IEC 9075: 1992	Database Language for Relational DBMS (SQL), as profiled by FIPS Pub 127-2: 1993
	AP1, WS1,3,4, DB1,2	ISO 9075-3: 1995	Open Database Connectivity - The SQL/CLI, call level interface.
OODBMS	DB1,2	***GAP*** (CORBA)	OMG—The Common Object Request Broker: Architecture & Specification (CORBA), Version 2: July 1995 (also available as X/Open CAE Specification P431 - Version 2).
			OMG—CORBA services, March 1996 (also available as X/Open CAE Specification P432 and P502).
			OMG—CORBA facilities, November 1995.
Flat File	NI1,2,3,4 AP1, WS1,3,4 DB1,2 PR1	***GAP*** (C-ISAM Spec 1170)	The X/Open specification for a portable index sequential access mechanism.
Transaction Processing	AP1, DB1,2	***GAP*** (X/Open DTP)	The X/Open standard model for Distributed Transaction Processing (DTP) CAE specification.

Figure B-15 (continued) - Generalized Standards Framework

IT Service	Technology Component Cross-reference	Standard	Comments
COMMUNICATION SERVICES			
File Transfer	NI1,2,3,4, AP1,2,3, WS1,,3,4 DB1,2 PR1	IETF Standard 9/RFC 959	File Transfer Protocol, October 1995.
E-Mail	AP1,2,3 WS1,3,4, DB1,2	ITU-T X.400 series	The ITU-T series of standards for Message Handling Systems (MHS), 1992.
	AP1,2,3 WS1,3,4, DB1,2	IETF Standard 12/RFC 822	Simple Message Transfer Protocol (SMTP).
EDI	AP1,2,3	ISO/IEC 9735:1998	UN EDIFACT
		PEDI ITU-T X.435-1997	ITU-T X.435 (PEDI), EDIFACT messaging over an X.400 MHS.
RDA	AP1,2,3 WS1,3,4, DB1,2	ISO/IEC 9579-1,2:1993	Remote Database Access mechanism.
RPC	AP1,2,3 WS1,3,4, DB1,2	***GAP*** (OSF/DCE RPC)	
Remote Systems Administration	AP1,2,3 WS1,3,4, DB1,2 PR1	IEEE Std 1387.2 - 1995	POSIX Systems Administration.
Network Management	AP1,2,3 WS1,3,4, DB1,2 PR1	IAB Standard 15/RFC 1157	Simple Network Management Protocol (SNMP), May 1990.
		IAB Standard 16/RFC1212, 1155	Structure of Management Information, May 1990.
		IAB Standard 17/RFC 1213	Management Information Base, March 1991.
		RFC1305	Network Time Protocol (V3), April 1992.

Figure B-15 (continued) - Generalized Standards Framework

IT Service	Technology Component Cross-reference	Standard	Comments
Authorization, Authentication & Audit	AP1,2,3 WS1,3,4	OSF/DCE Security	POSIX Security based upon MIT KERBEROS and OSF/DCE Security.
Common Network Protocols			
Transport	NI1,2,3,4 AP1,2,3 WS1,3,4, DB1,2 PR1	IETF Standard 7/RFC-793	Transmission Control Protocol (TCP), September 1981.
		IAB Standard 6/RFC-768	User Datagram Protocol (UDP), August 1980.
Network	NI1,2,3,4 AP1,2,3 WS1,3,4, DB1,2 PR1	IETF Standard 5/RFC 791, 950, 919, 922, 792, 1112	Internet Protocol (IP), September 1981.
LAN	NI1,2,3,4 AP1,2,3 WS1,3,4, DB1,2 PR1	ISO/IEC 8802.2: 1998	Logical Link Control.
		ISO 8802.3 (IEEE 802.3)	Carrier Sense Multiple Access with Collision Detection (CSMA-CD), Ethernet.
		IETF Standard 41/RFC 894	Standard for the transmission of IP datagrams over Ethernet networks, April 1984.
		IETF Standard 37/RFC 826	Standard for Ethernet address resolution protocol, November 1982.
		100BaseT (IEEE Std 802.3u:1995)	100 Mbits/s Media Access Unit (MAU) for transmission over category 5 unshielded twisted pair cable.
Backbone	NI1,2,3,4	***GAP*** (ATM)	ATM Forum's UNI Specification V3.1, September 1994.
		ANSI T1.630: 1993	ATM adaptation layer for constant bit rate services functionality and specifications, 1993.
		ANSI T1.635: 1994	ATM adaptation layer type 5 common part functions and specifications, 1994, which adopts ITU-T I.363, section 6.
		RFC1577	Classical IP and address resolution protocol (ARP) over ATM, January 1994.

Figure B-15 (continued) - Generalized Standards Framework

IT Service	Technology Component Cross-reference	Standard	Comments
WAN (ISDN)	NI1,2,3,4	ANSI T1.601: 1992	ISDN Basic access interface, 1992.
		ANSI T1.408: 1990	ISDN Primary rate interface, 1990.
		ITU-T Q.921: 1997	ISDN Data Link layer specification—Digital Subscriber Signaling System (DSSS 1), No.1, 1993.
		ITU-T Q.931: 1993	ISDN Specification for basic call control DSSs 1, 1989.
		IETF Standard 51/RFC 1661, 1662	PPP, July 1994.
		RFC 1332	PPP Internet Protocol Control Protocol (IPCP), May 1992.
		RFC 1333	PPP Link Quality Monitoring, May 1992.
		RFC 1334	PPP Authentication Protocols, October 1992
		RFC 1570	PPP Link Control Protocol Extensions, January 1994.
		RFC 1618	PPP over ISDN, May 1994.

Figure B-15 (continued) - Generalized Standards Framework

B.4 Technology Components

The Technology Component models shown in this subsection are a consolidation of all the models of the profile examples described in B.1 and B.2.

Figure B-16 references the Technology Components to the profiles examples

Example Profiles	**Banking**	**Petrochem**
Technology Components		
NI1 [NI Services, LAN/MAN]		**Y**
NI2 [NI Service, LAN/WAN]	**Y**	
NI3 [NI Service, LAN/CAN or MAN]		**Y**
AP1 [Generalized Application Service]	**Y**	**Y**
AP2 [Real-Time Processing Service]		**Y**
AP3 [Supercomputing Service]		**Y**
WS1 [Generalized WS]	**Y**	**Y**
WS3 [High-Definition Graphical WS]	**Y**	**Y**
PS1 [Generalized Print Service]	**Y**	**Y**
DB1 [Generalized DB Service]	**Y**	**Y**
DB2 [DB Service for Data Warehousing]	**Y**	
VTC [Video Teleconferencing Service]		**Y**

Figure B-16 - Technology Component - Profile Example of Cross-Reference

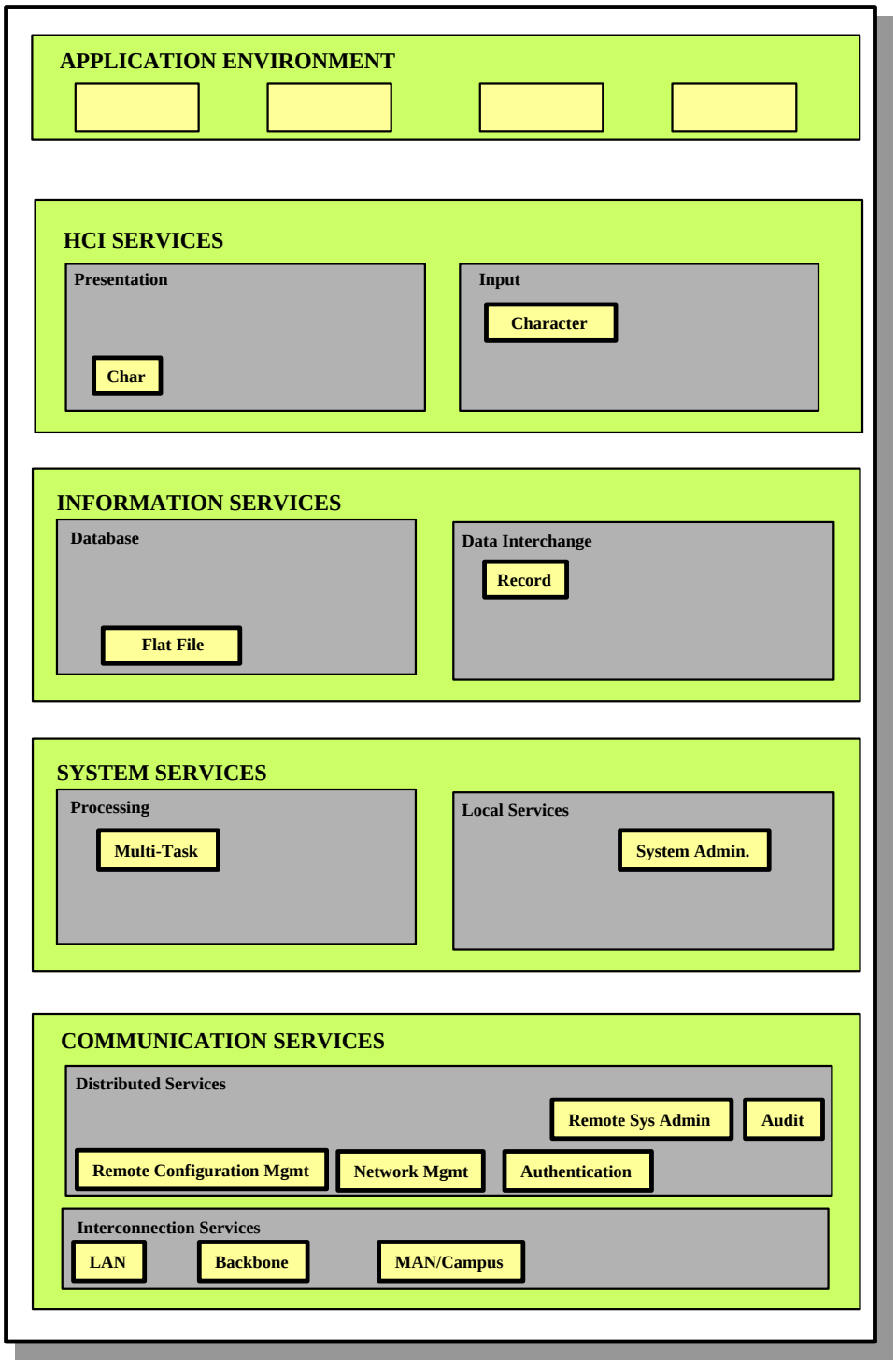


Figure B-17 - NI Service; Technology Component [NI1, NI3]

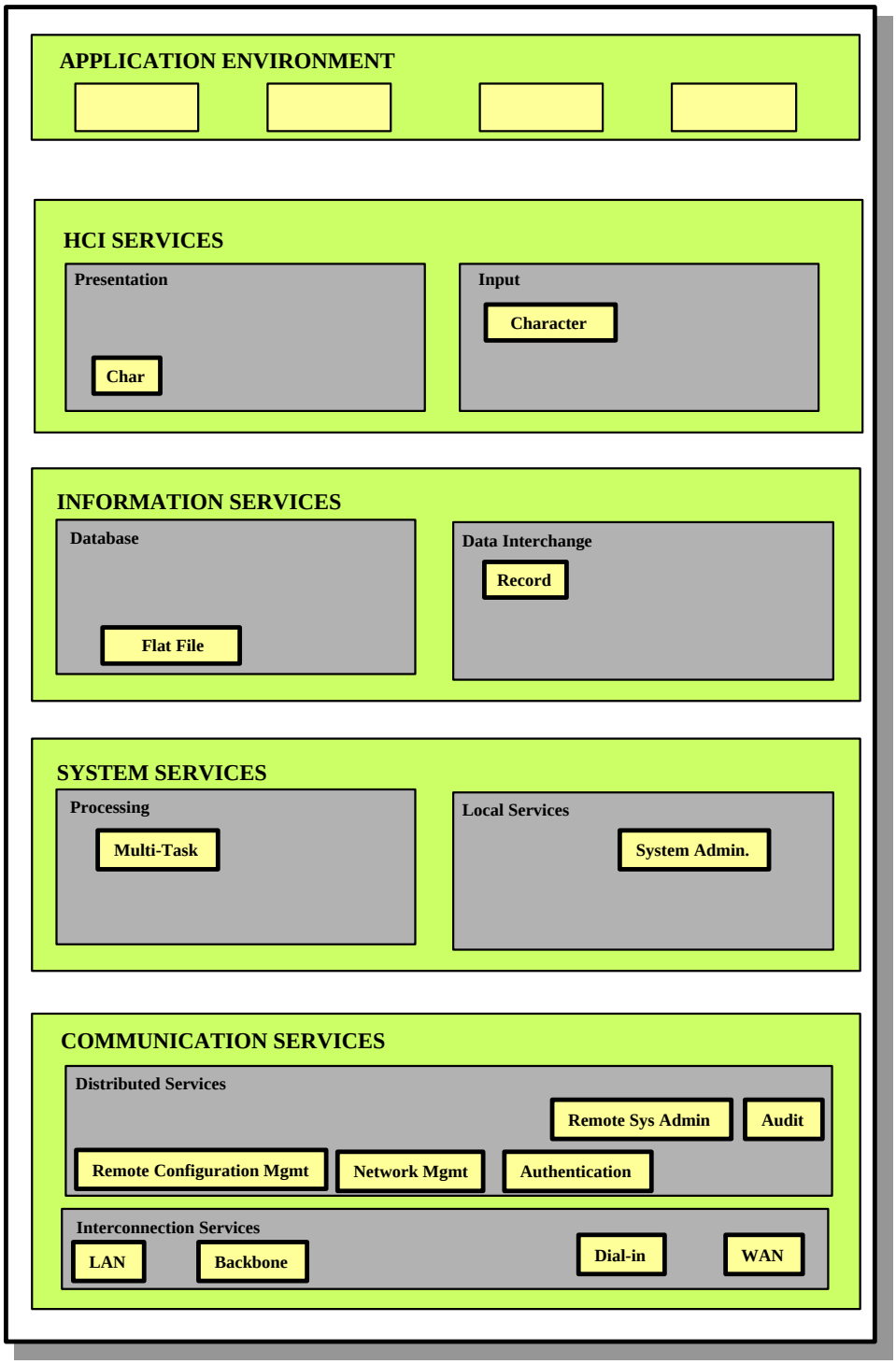


Figure B-18 - NI Service; Technology Component [NI2]

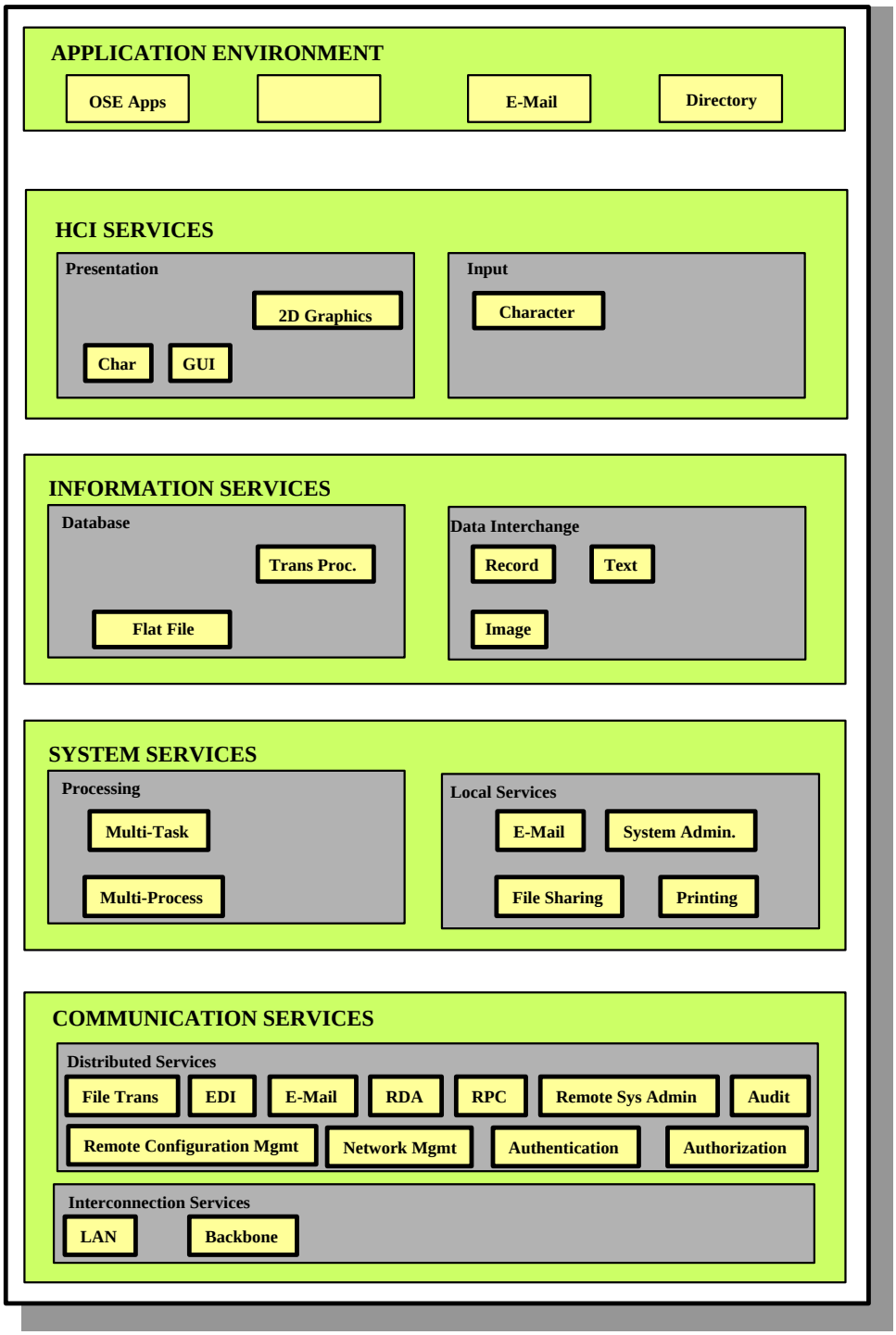


Figure B-19 - Generalized Application Service; Technology Component [AP1]

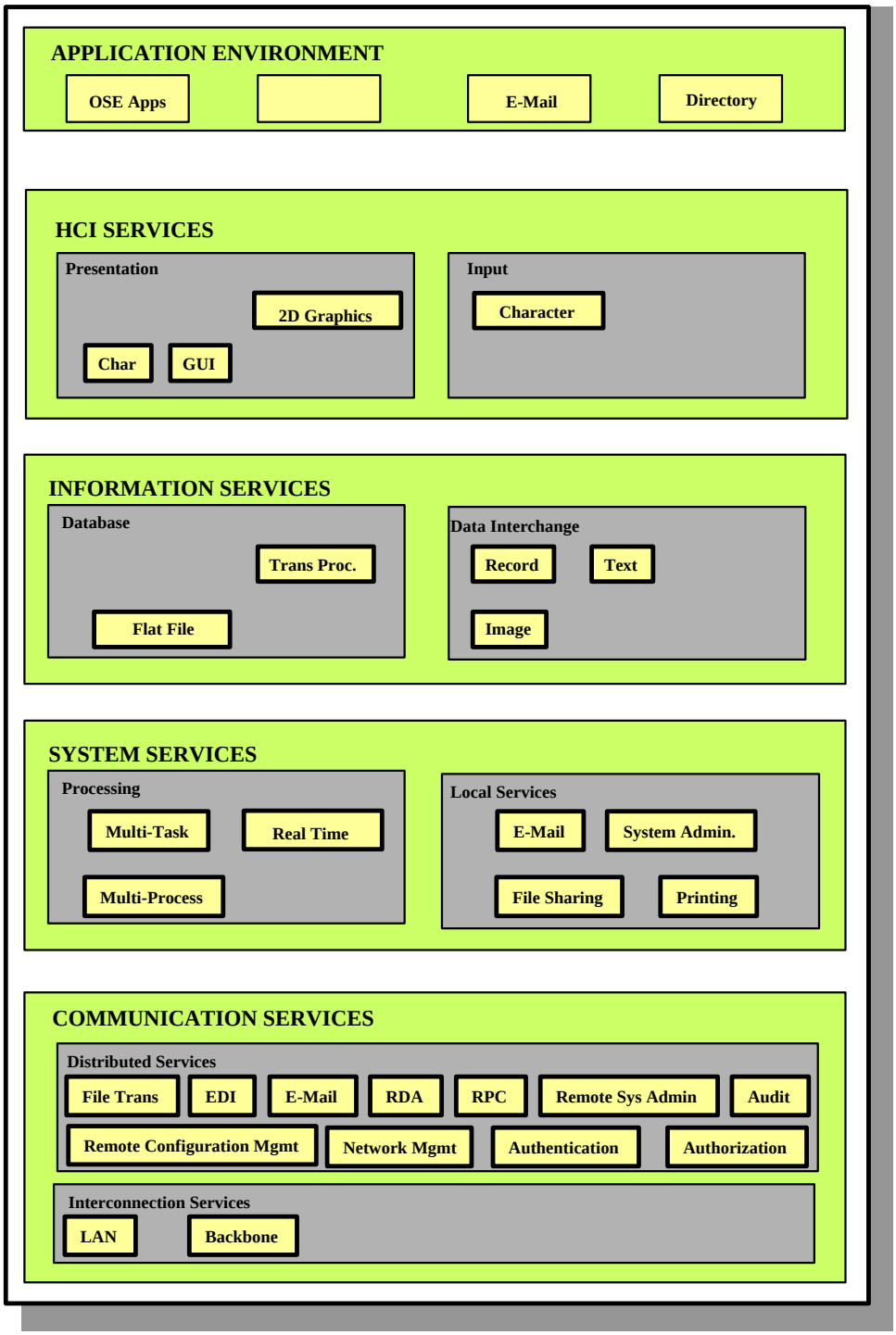


Figure B-20 - Real-Time Processing Service; Technology Component [AP2]

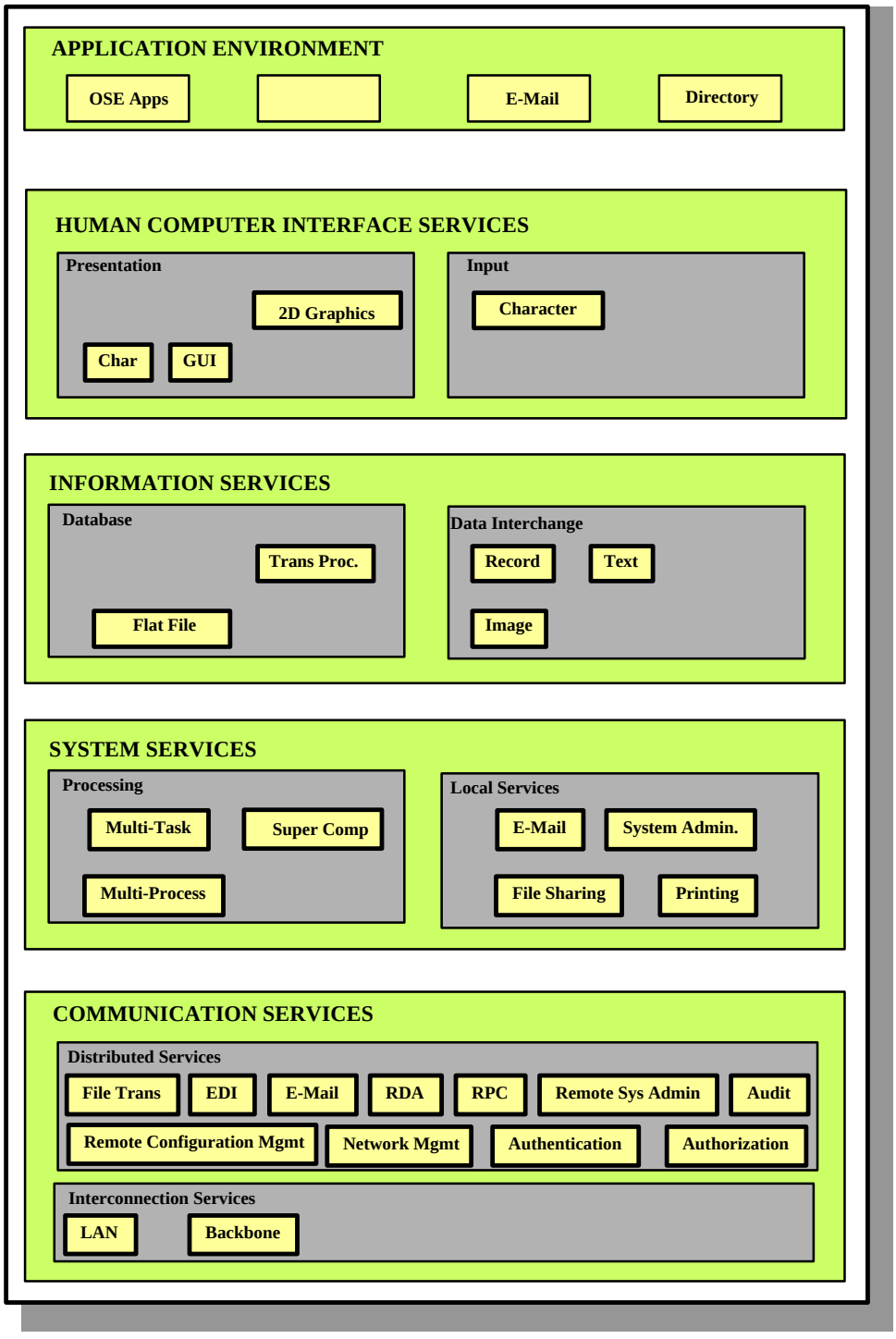


Figure B-21-Supercomputing Service; Technology Component [AP3]

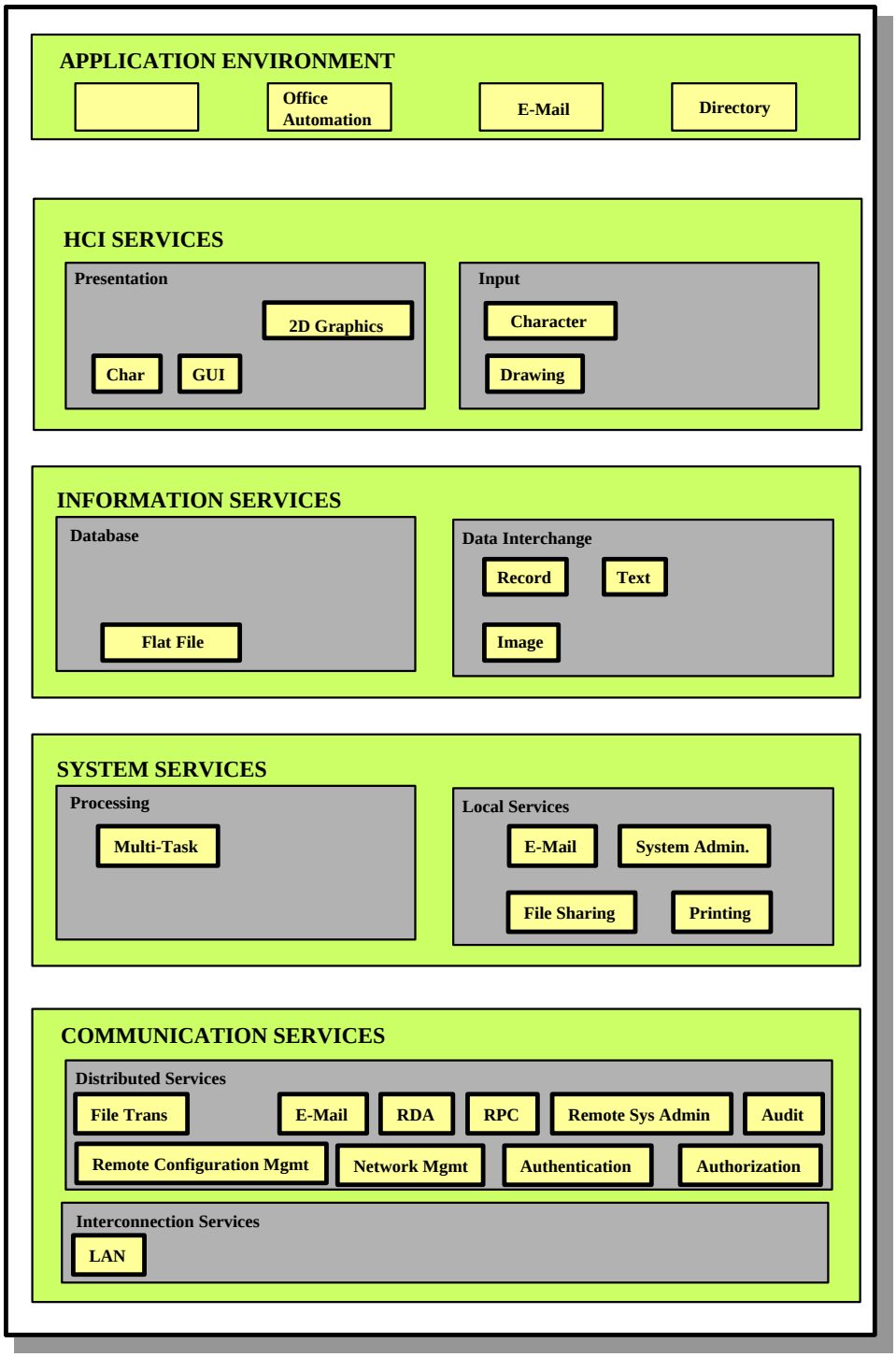


Figure B-22 - Generalized WS; Technology Component [WS1]

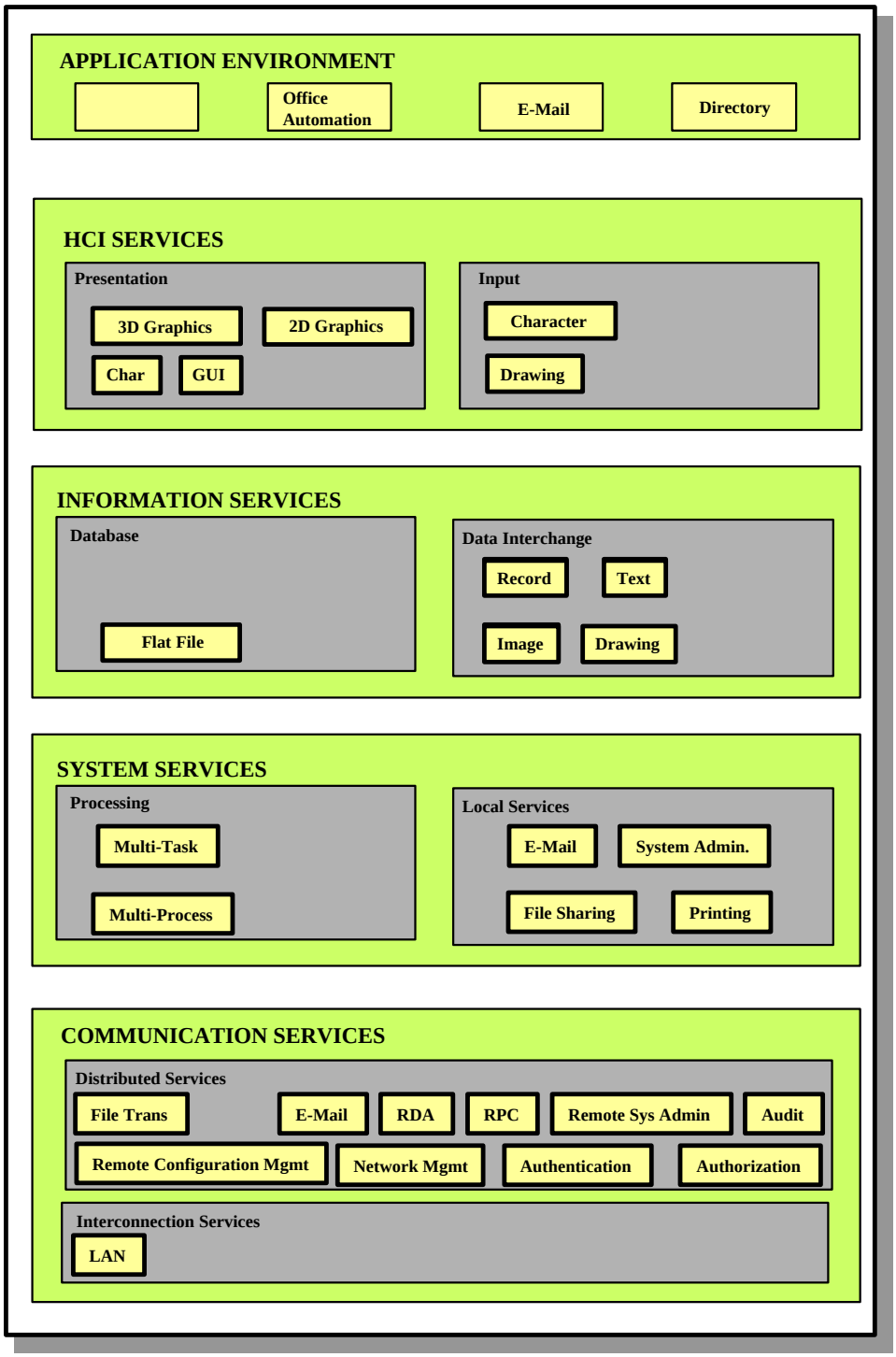


Figure B-23 - High-Definition Graphical WS; Technology Component [WS3]

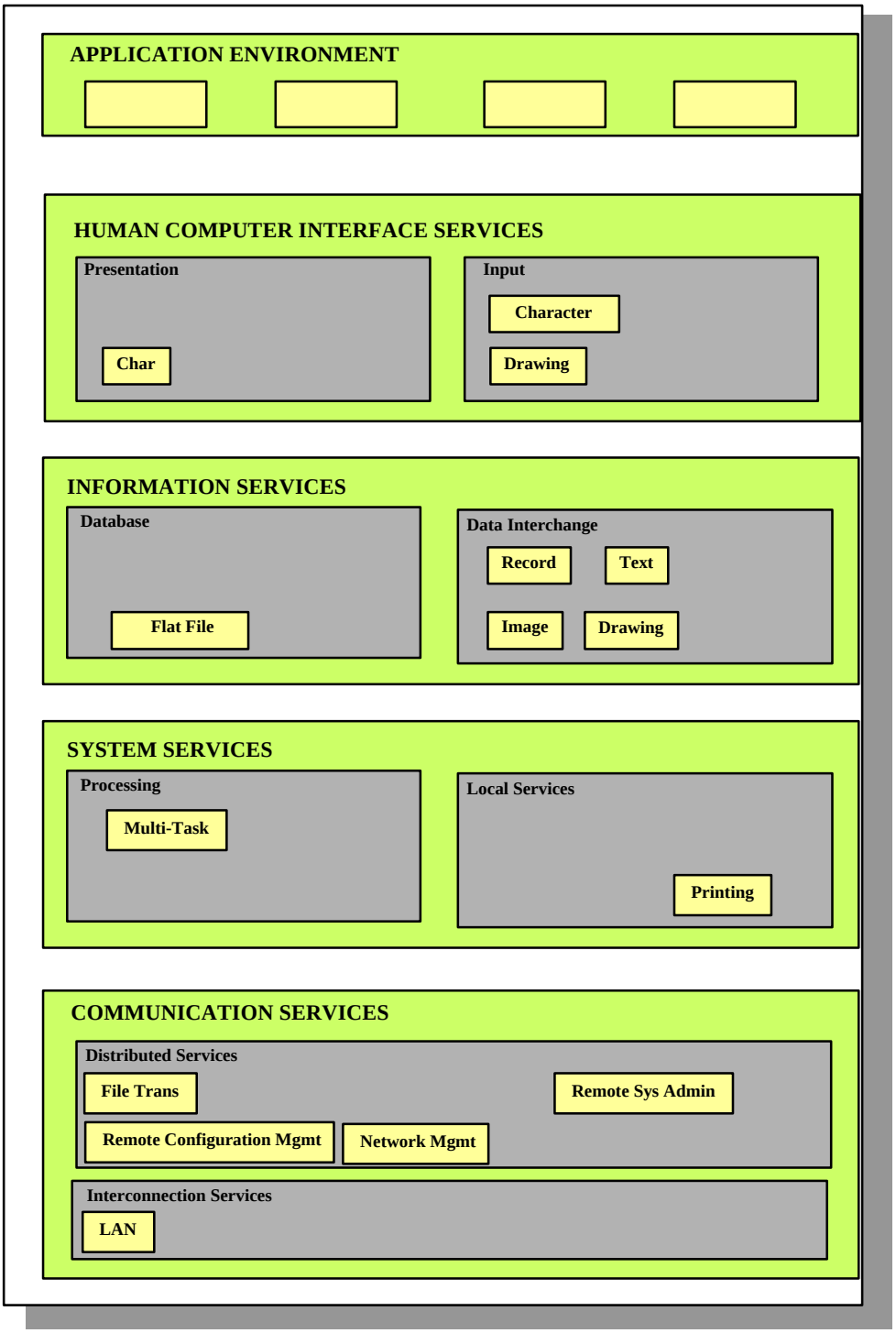


Figure B-24 - Generalized Print Service; Technology Component [PS1]

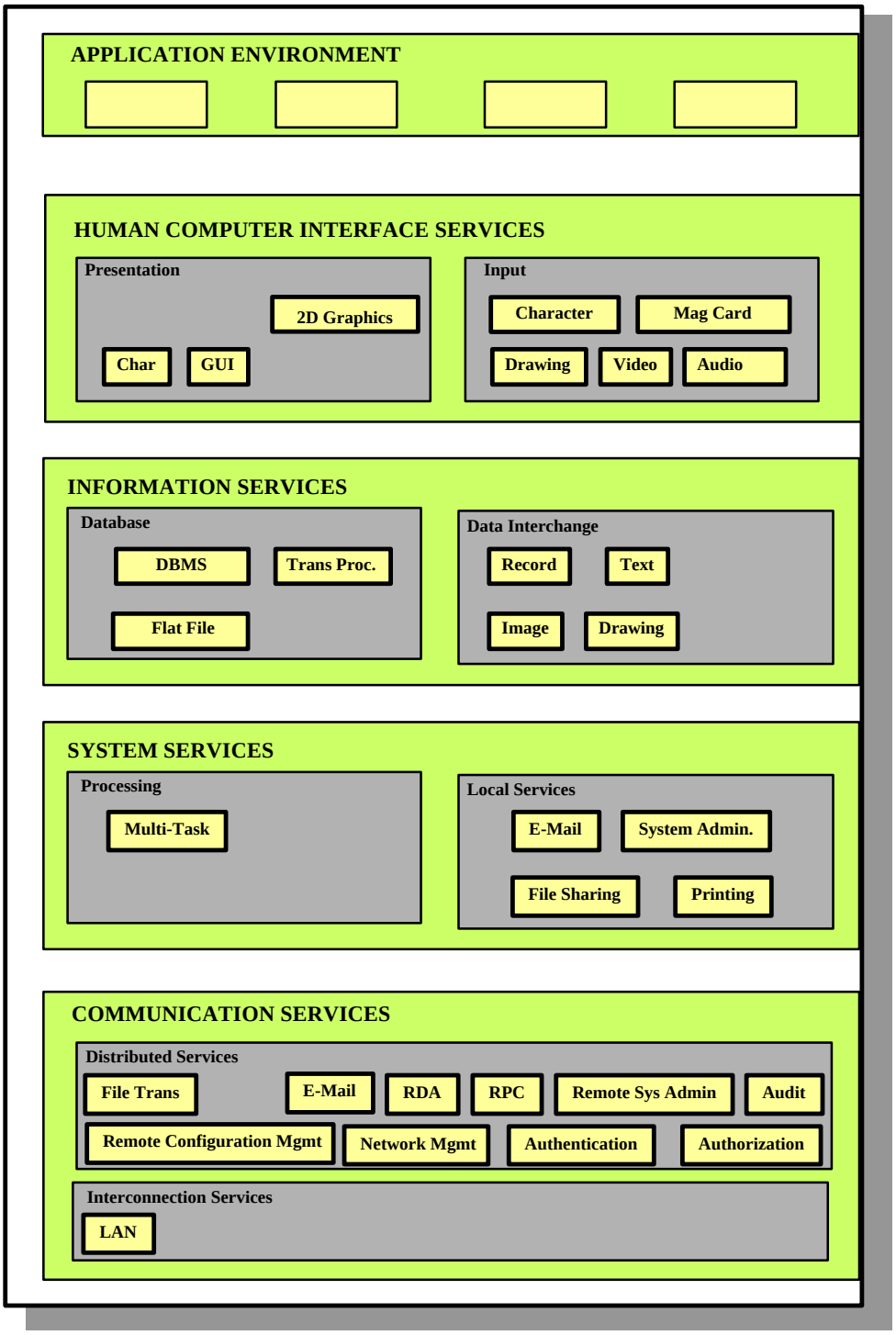


Figure B-25 - Generalized Database Service; Technology Component [DB1]

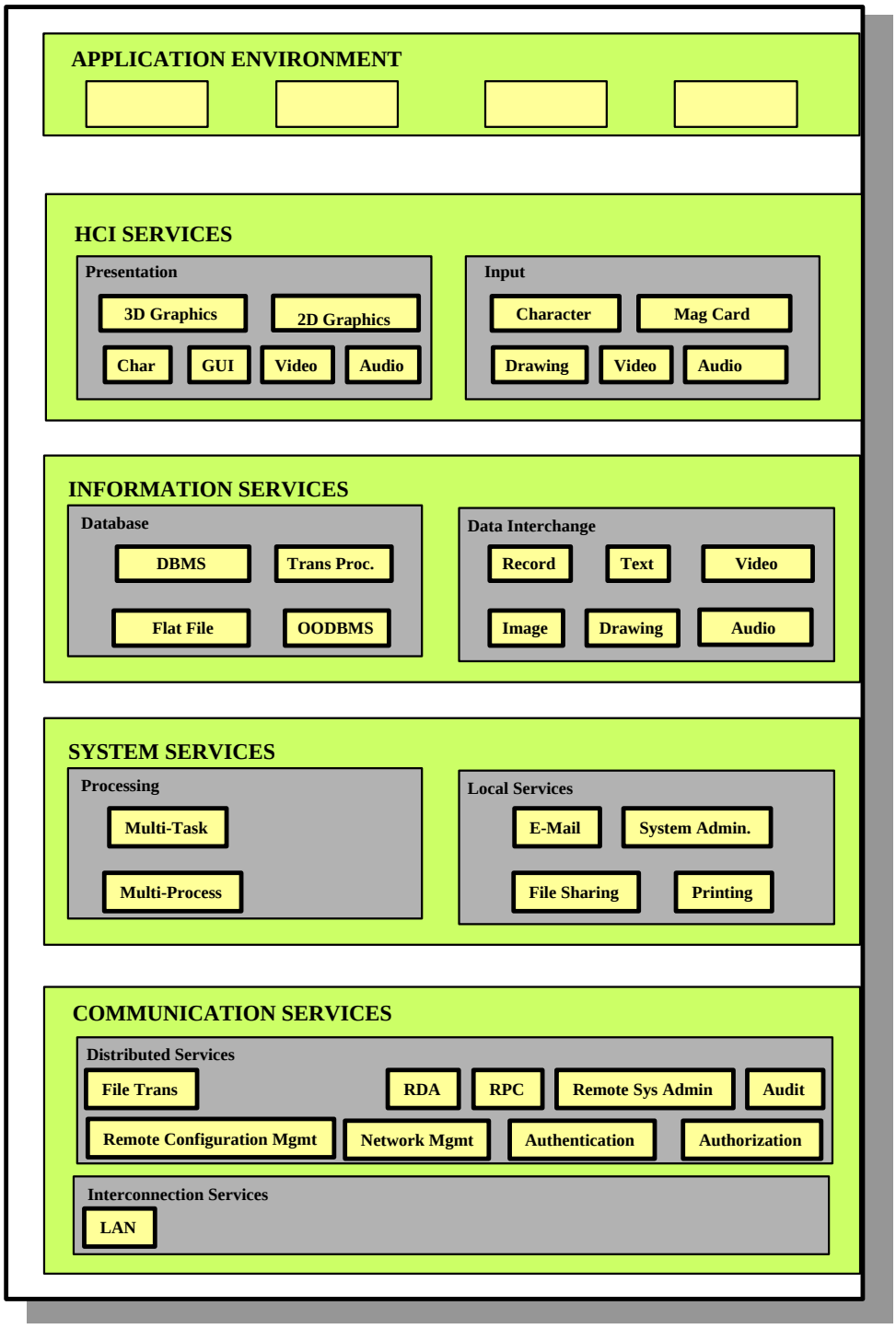


Figure B-26 - Database Service for Data Warehousing; Technology Component [DB2]

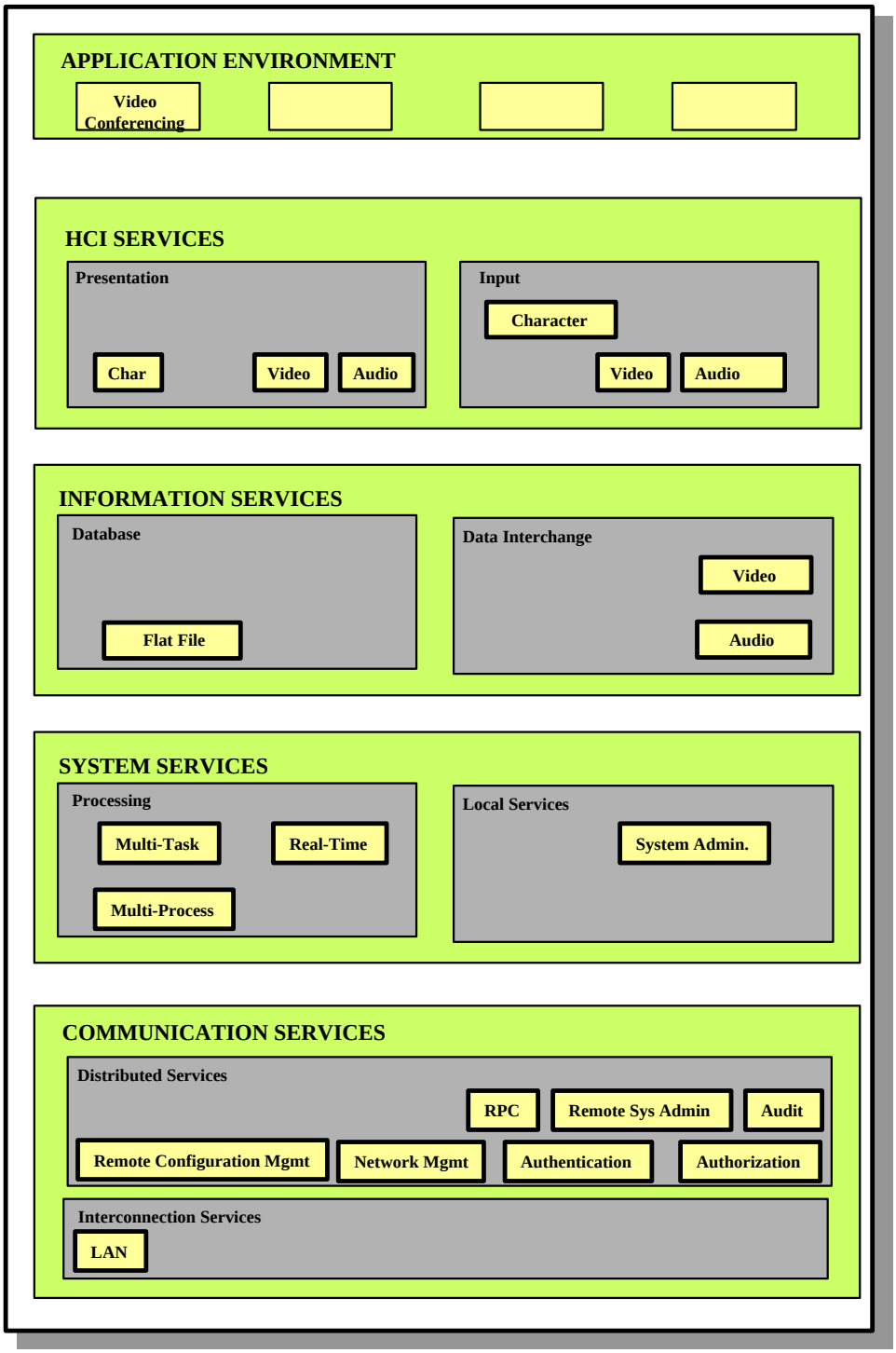


Figure B-27 - Video Teleconferencing Service; Technology Component [VTC]

B.5 Populated IT Service Models

The populated IT Service models documented in this subsection are a consolidation of the IT Service requirements of the example User Organization OSE Profiles. Figure B-28 relates these models (as shown in Figures B-29 through B-46) to the specific Technology Component requirements of the example profiles.

OSE Service Group	**Human Computer Interface Services**										**System Services**								**Information Services**										**Communication Services**														
IT Service Group	Presentation						Input				Processing				Local Services				Data Interchange						Database				Distributed Services											Interconnection			
IT Service	GUI	2D Graphics	3D Graphics	Character	Video	Audio	Character	Drawing	Video	Audio	Multi-tasking	Multi-processing	Real Time	Super-computing	E-Mail	Printing	File Sharing	System Admin.	Record	Text	Image	Drawings	Video	Audio	DBMS	ODBMS	Flat File	Trans. Processing	File Transfer	E-Mail	EDI	Remote DB Access	RPC	Remote System Admin.	Remote Config. Mgmt.	Network Management	Authentication	Authorisation	Audit	LAN	Back Bone	MAN	WAN
Technology Components																																											
NI1				Y			Y				Y							Y	Y								Y							Y	Y	Y	Y		Y	Y	Y	Y	
NI2				Y			Y				Y							Y	Y								Y							Y	Y	Y	Y		Y	Y	Y		Y
NI3				Y			Y				Y							Y	Y								Y							Y	Y	Y	Y		Y	Y		Y	
AP1	Y	Y		Y			Y				Y	Y			Y	Y	Y	Y	Y	Y	Y						Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y			
AP2	Y	Y		Y			Y				Y	Y	Y		Y	Y	Y	Y	Y	Y	Y						Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y			
AP3	Y	Y		Y			Y				Y	Y		Y	Y	Y	Y	Y	Y	Y	Y						Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y			
WS1	1	Y		Y			Y	Y			Y				Y	Y	Y	Y	Y	Y	Y						Y		Y	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y			
WS3	2	Y	Y	Y			Y	Y			Y	Y			Y	Y	Y	Y	Y	Y	Y	Y	Y	Y			Y		Y	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y			
PS1				Y			Y	Y			Y					Y			Y	Y	Y	Y					Y		Y					Y	Y	Y				Y			
DB1	Y	Y		Y			Y	Y			Y				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y			
DB2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y			Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y			
VTC					Y	Y			Y	Y	Y										Y		Y	Y	Y	Y	Y													Y			Y

Figure B-28 - Technology Component/IT Service Cross-Reference

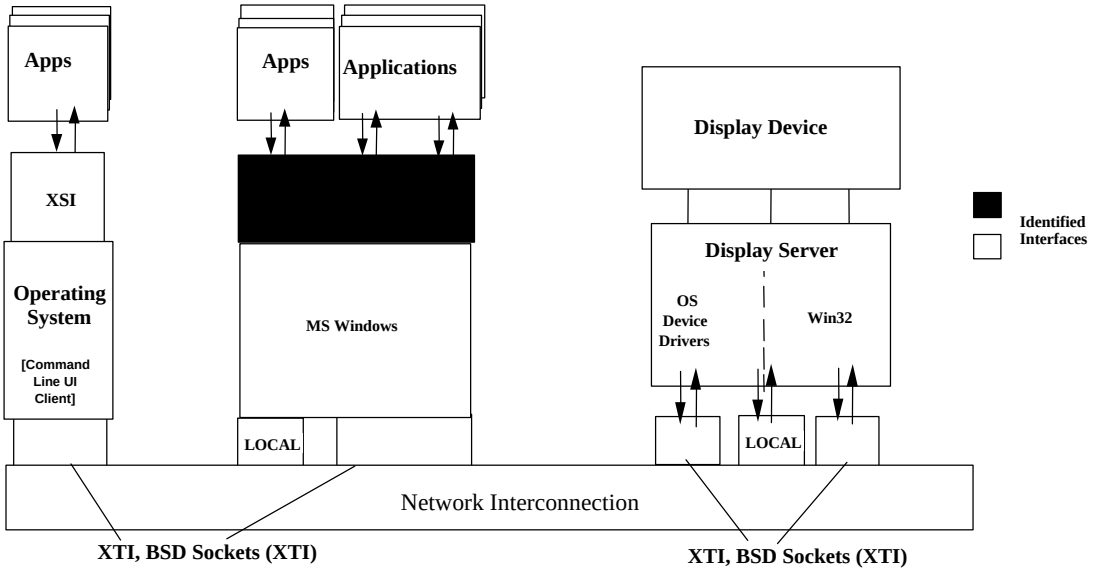


Figure B-29 - GUI (1) - IT Service Model

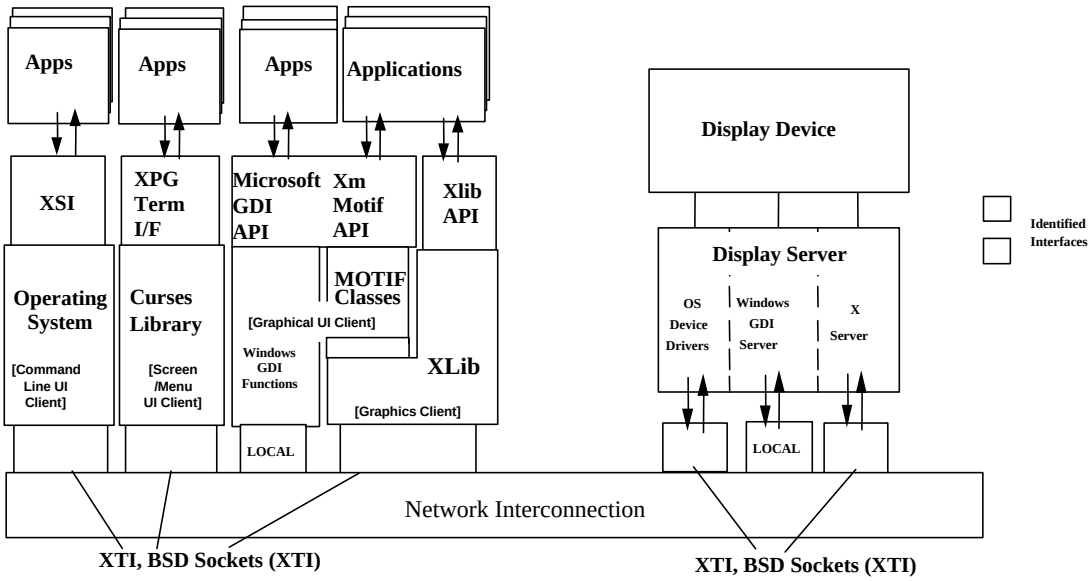


Figure B-30 - GUI (2) - IT Service Model

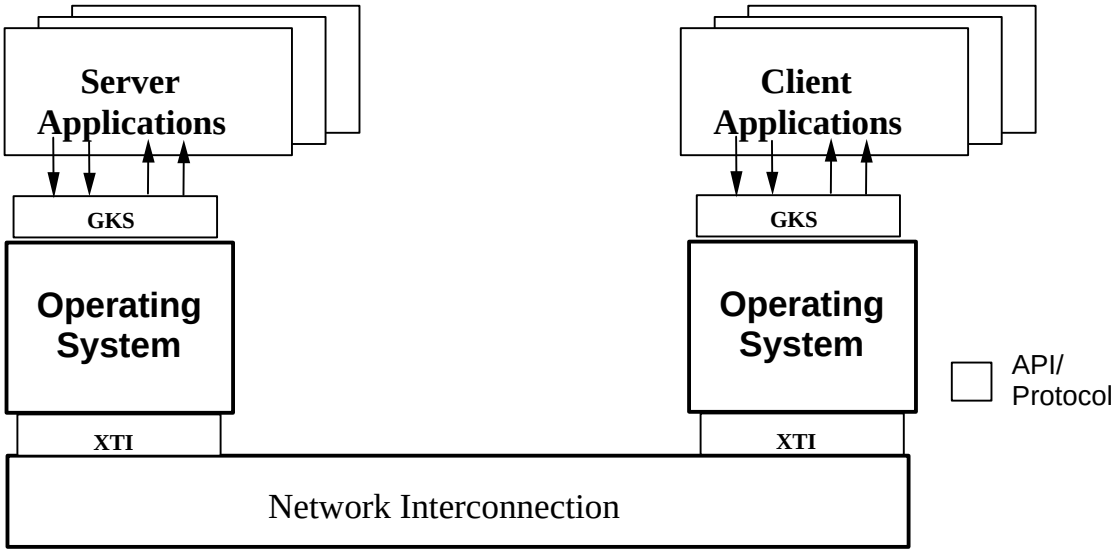


Figure B-31 - 2D Graphics (Presentation) - IT Service Model

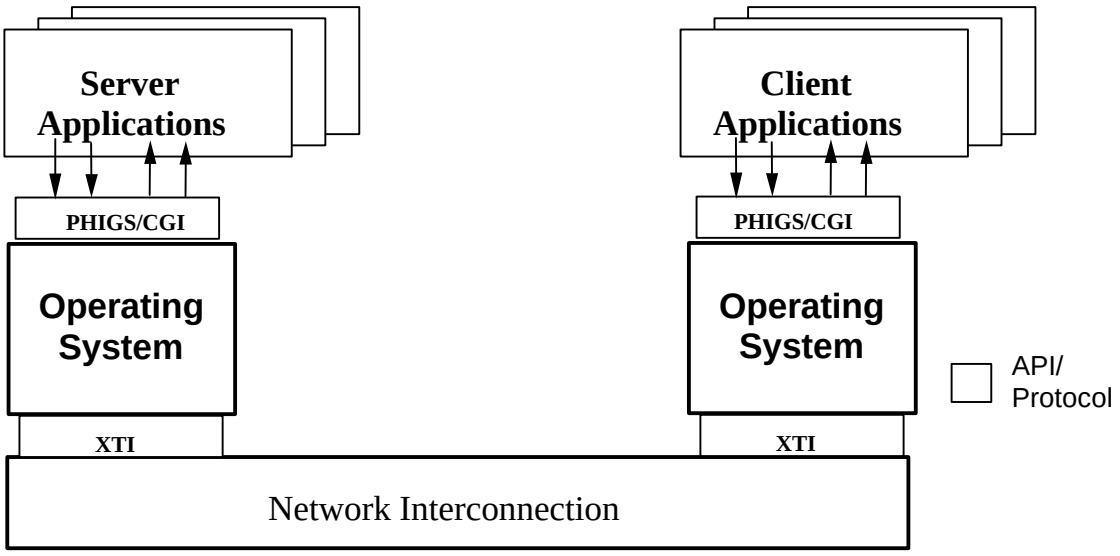


Figure B-32 - 3D Graphics (Presentation) - IT Service Model

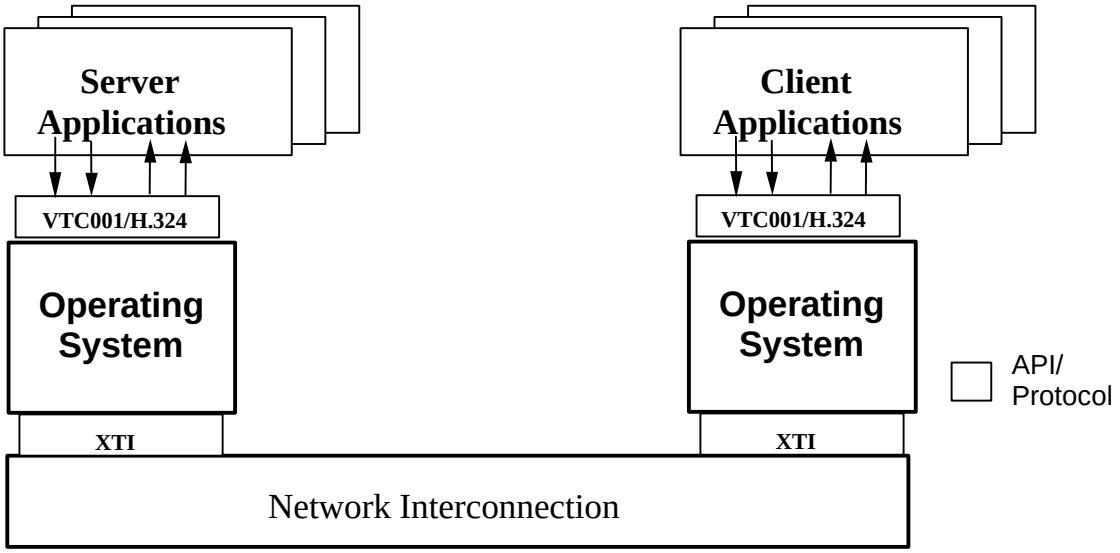


Figure B-33 - Video/Audio (Presentation) - IT Service Model

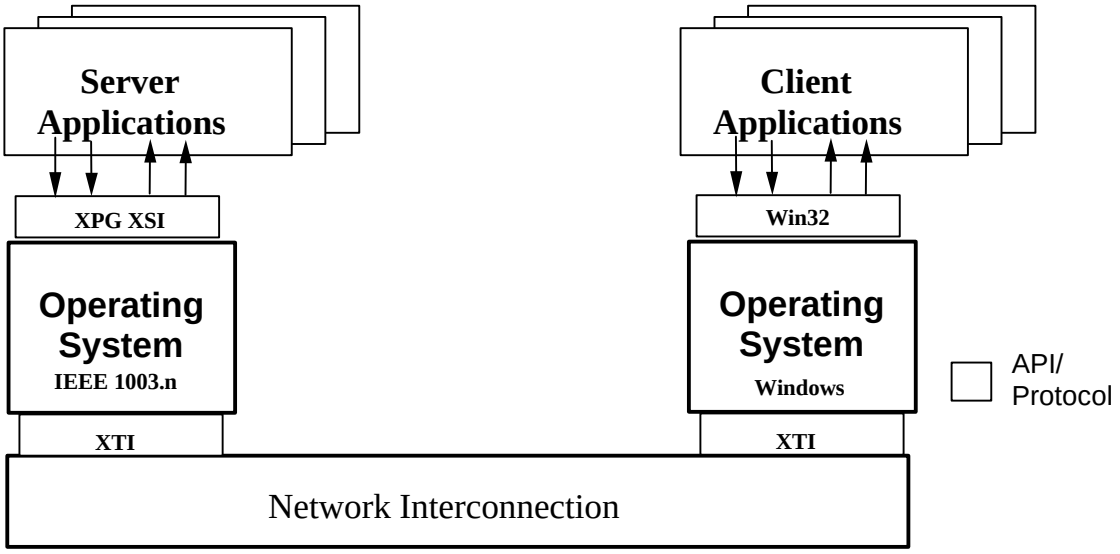


Figure B-34 - Processing Multi-Tasking, Multi-Processing Supercomputing and RealTime - IT Service Model

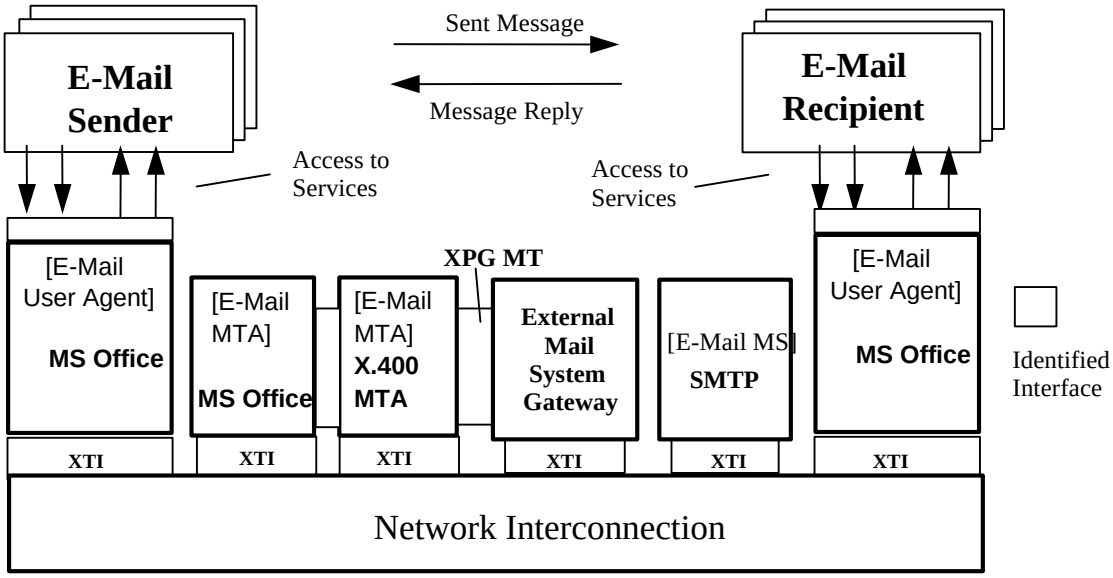


Figure B-35 - E-Mail, Local, and Distributed - IT Service Model

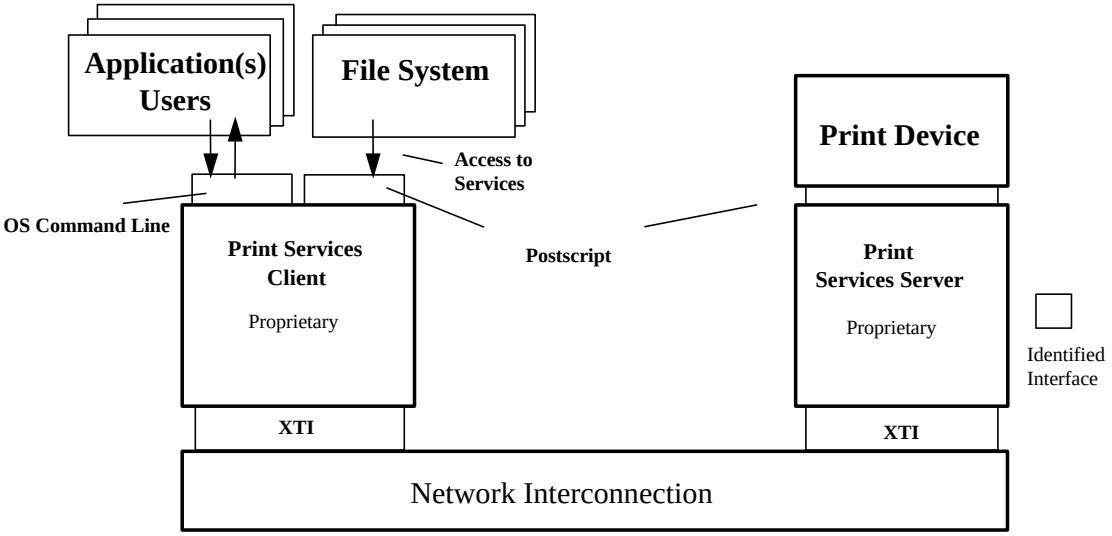


Figure B-36 - Print Services - IT Service Model

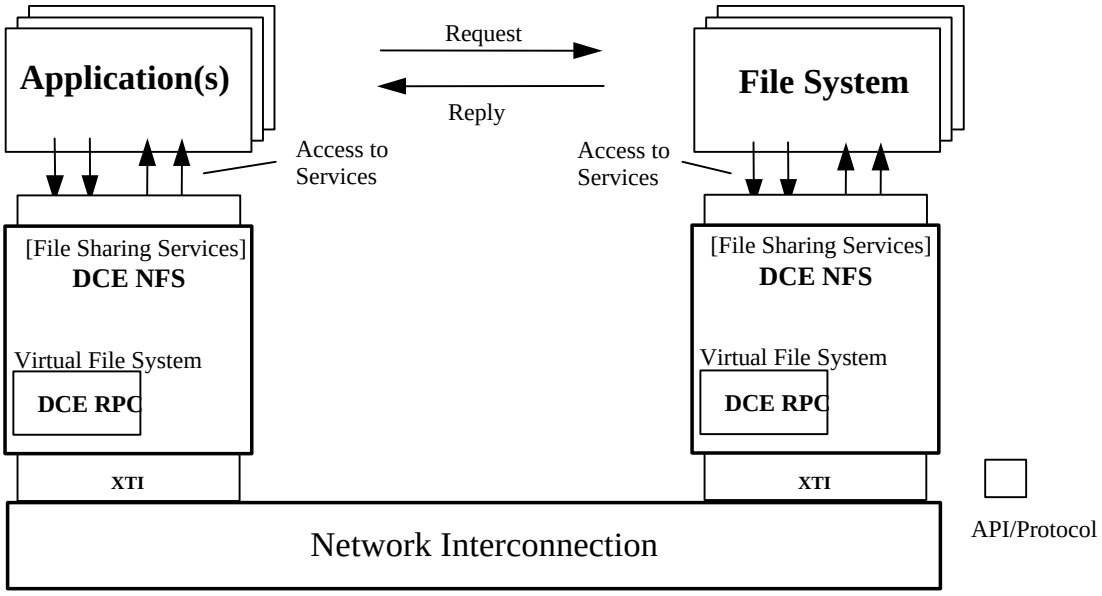


Figure B-37 - File Sharing Services - IT Service Model

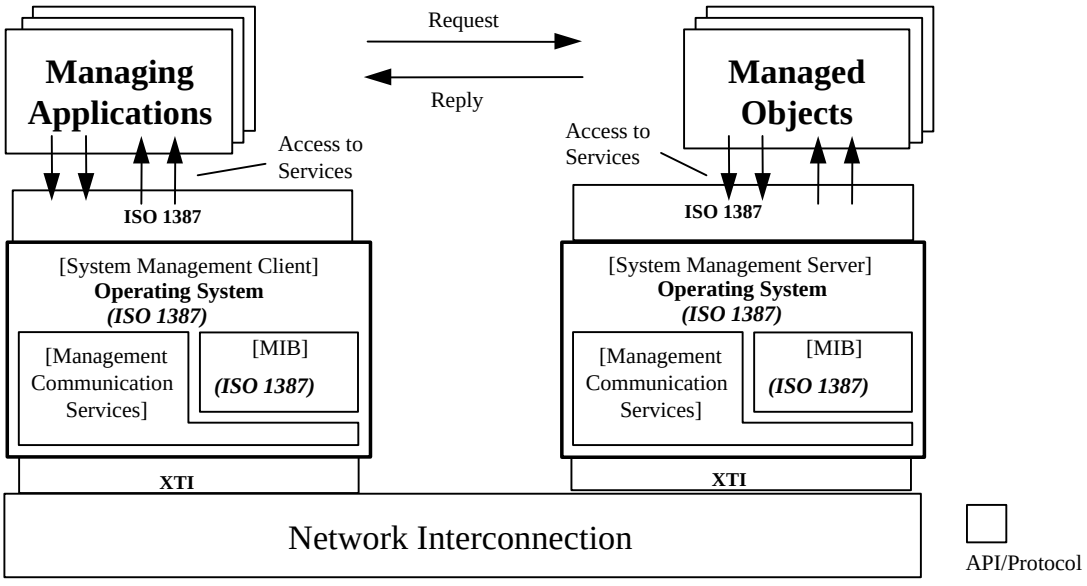


Figure B-38 - Systems Administration (Local and Remote) - IT Service Model

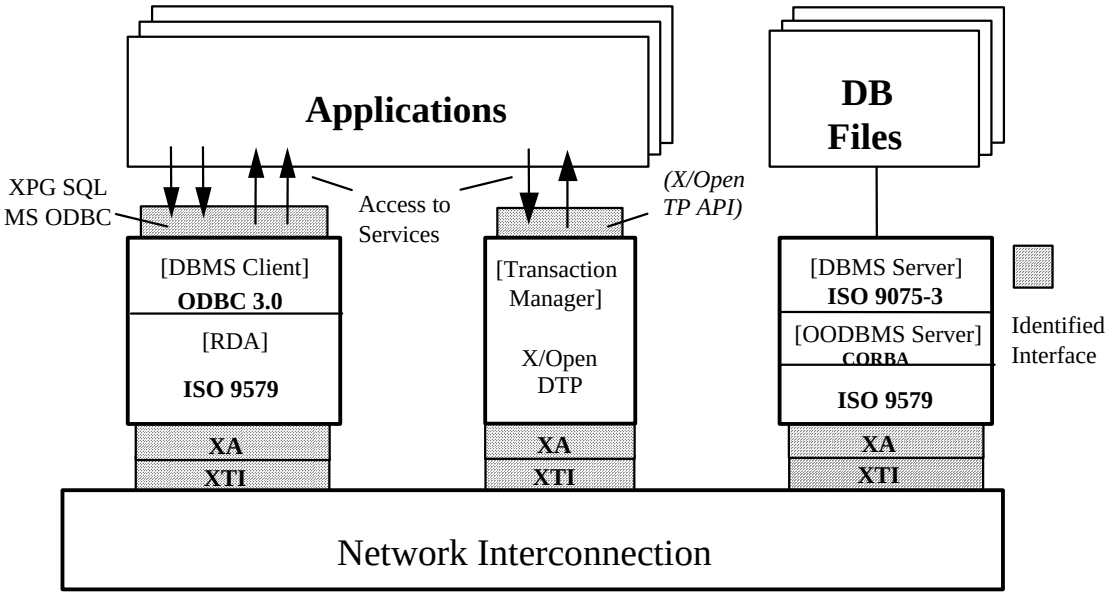


Figure B-39 - DBMS, OODBMS, and Transaction Processing - IT Service Model

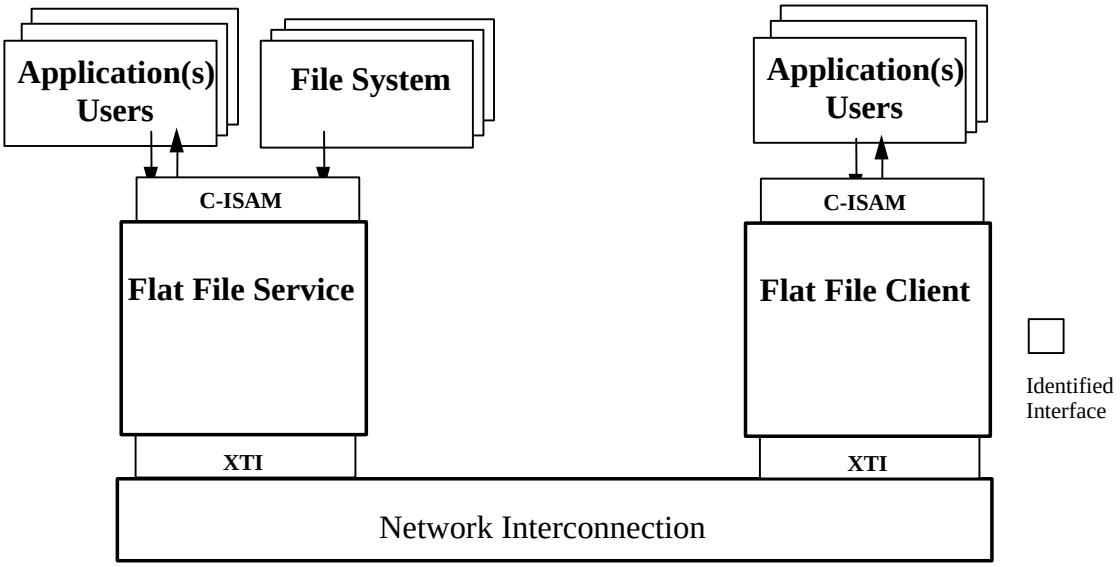


Figure B-40 - Flat File Service - IT Service Model

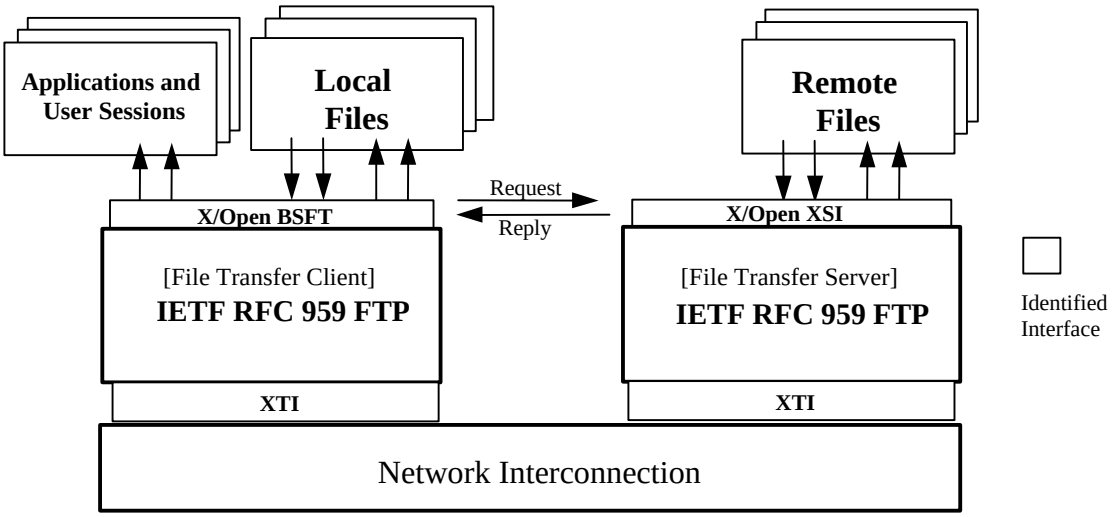


Figure B-41 - File Transfer - IT Service Model

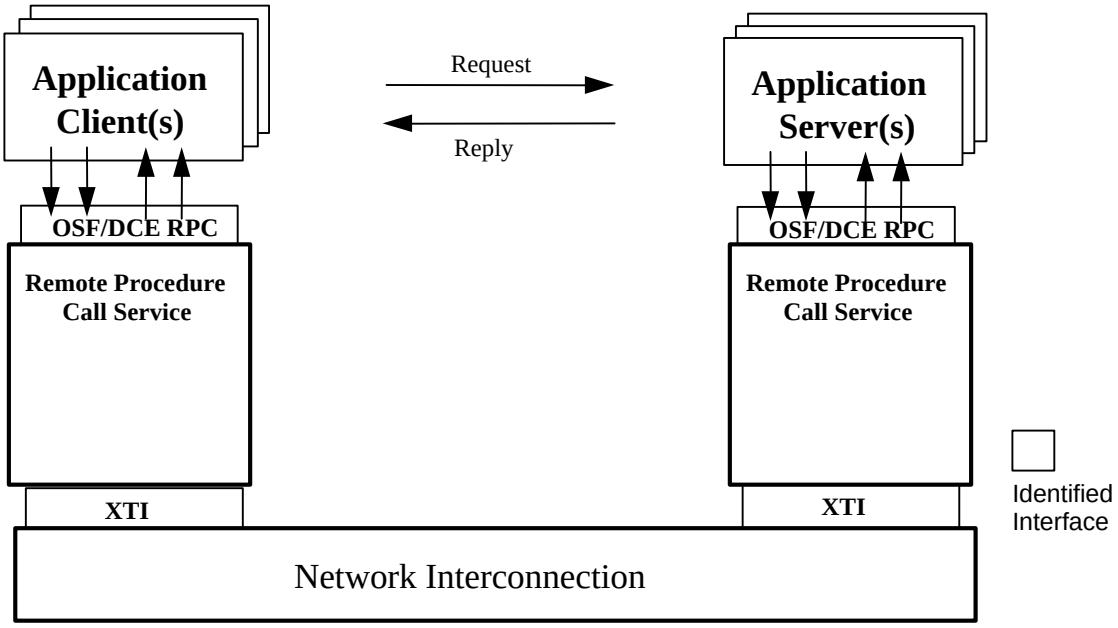


Figure B-42 - RPC - IT Service Model

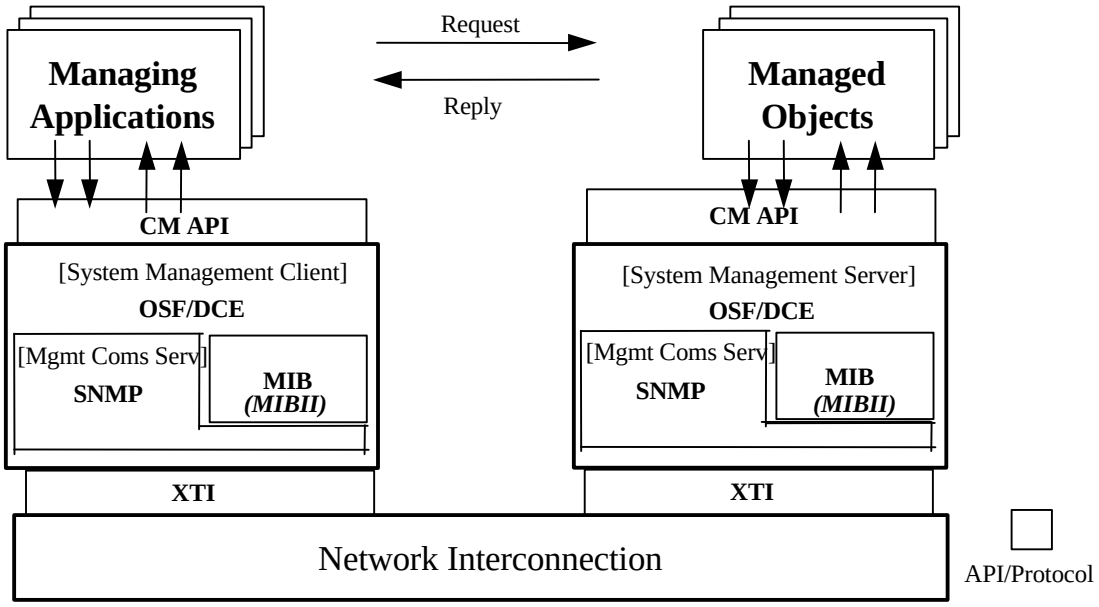


Figure B-43 - Network Management - IT Service Model

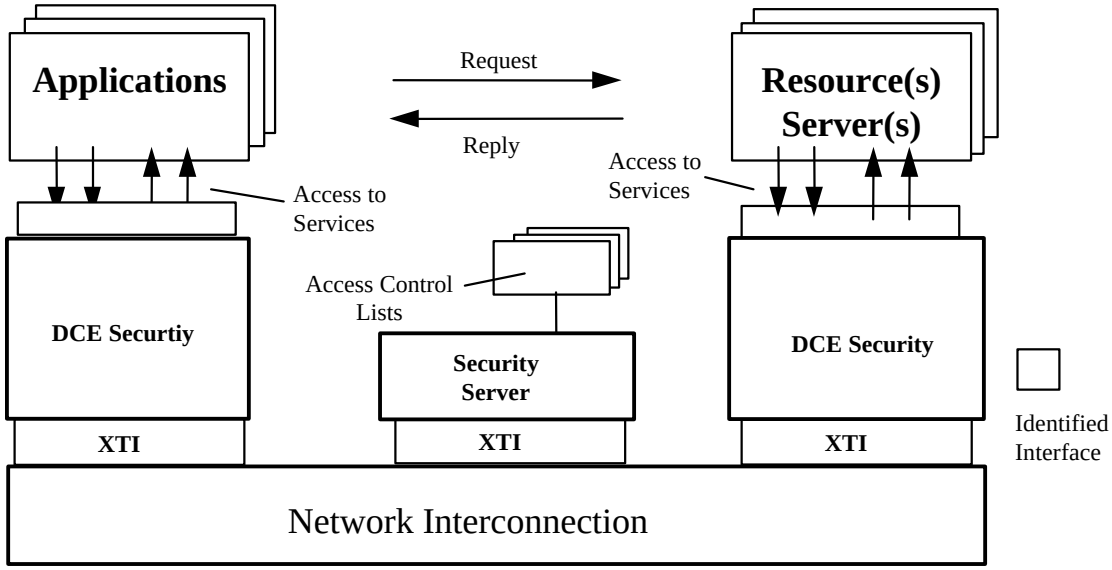


Figure B-44 - Authorization and Authentication - IT Service Model

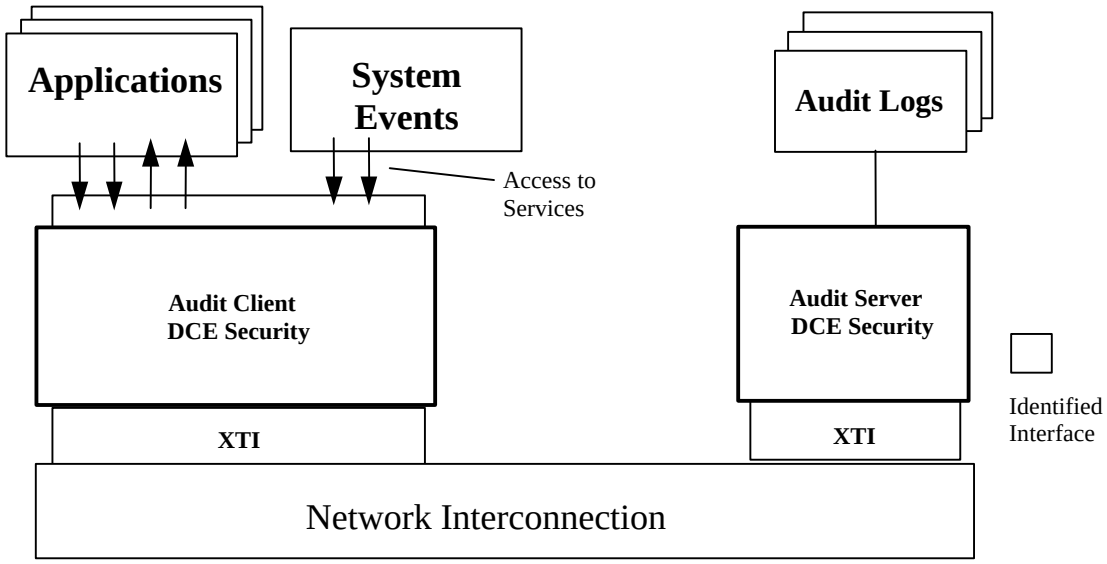


Figure B-45 - Audit - IT Service Model

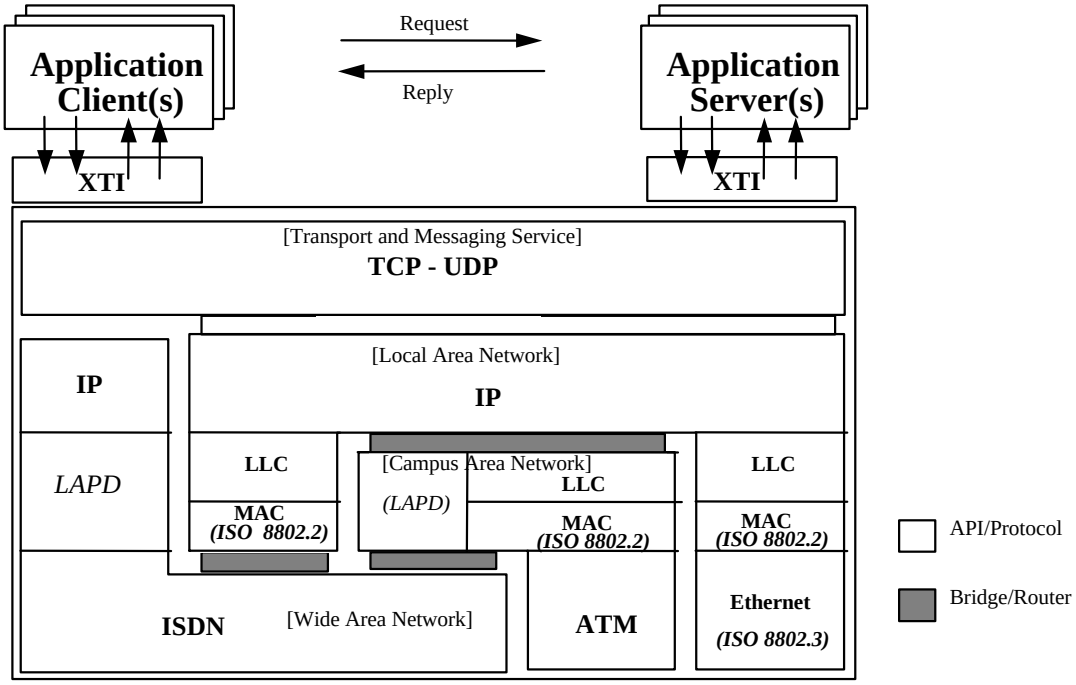


Figure B-46 - LAN, MAN, and WAN - IT Service Model