Fundamentals of the R/3 System

R/3 System Concept

Client/Server Architecture

SAP's R/3 System is a sophisticated data processing package. It provides a variety of comprehensive business application software solutions for every area within your organization.

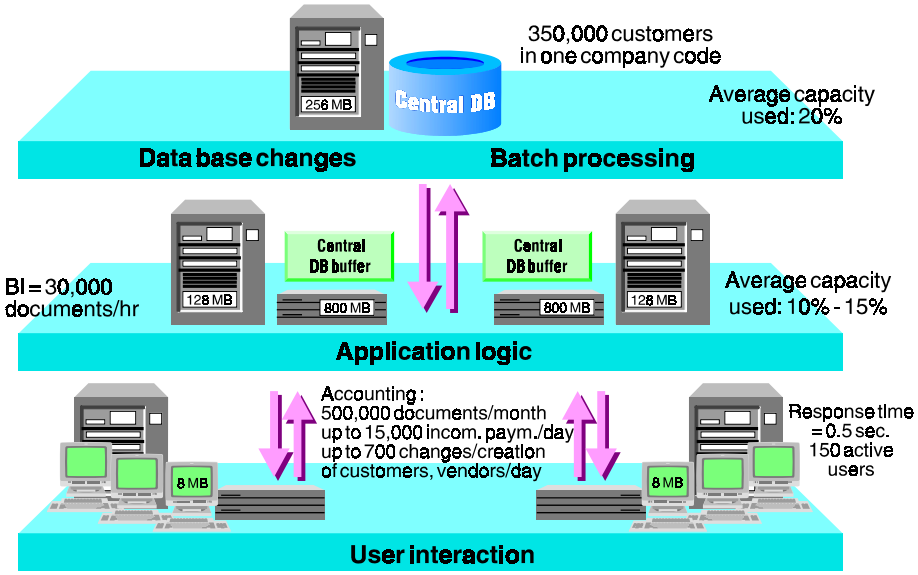

Fig. A-1: R/3 System Architecture

Decentralized Data Processing Solutions

The combination of both organizational structures and online functions leads directly to a decentralized data processing concept with three distinct levels:

- **Data base server**
  Central computer used to handle all data base functions such as updating, clearing, and so on.

- **Application server**
  These are connected to the data base server and serve a specific department to load and execute the application programs.

- **Presentation server**
  Work stations, PCs, and terminals are connected to the application server and used to enter and display data.

Flexible client/server architecture enables you to make optimum use of your company's computing resources, take advantage of new hardware technology, and adapt your business procedures to suit your specific requirements.

The most important features of the client/server model are:

- the use of integrated real-time processing.
- the provision of a graphic user interface.
- the adoption of a relational data model enabling data storage and response times to be optimized.

The decentralized R/3 System guarantees sophisticated data processing technology, as well as supporting and complementing the centralized DP organizational structures within a company.

Integrated Modular System Architecture

R/3 Applications

The implementation, use, and ongoing maintenance of business application software demands solutions which are both suited to the task and economical to buy. SAP's efficient R/3 standard software pursues these objectives via a flexible, modular structure of individual components:

- Accounting System:
  - Financial Accounting (FI)
  - Controlling (CO)
  - Asset Management (AM)
- Logistics:
  - Sales and Distribution (SD)
  - Materials Management (MM)
  - Production Planning (PP)
  - Quality Management (QM)
  - Plant Maintenance (PM)
- Project System (PS)
- Human Resources (HR)
- Industry Solutions (IS)
- Workflow (WF)

Each of these can be further divided into a range of individual functions, as shown below for Financial Accounting:

- General Ledger Accounting
- Financial Assets
- Accounts Receivable / Accounts Payable

- Funds Management
- Financial Controlling
- Consolidation

Individual Module Selection

You can combine individual components both within and across these main applications into comprehensive software solutions, which you can then implement step-by-step. For example, you might combine the Purchasing and Invoice Verification components (from Materials Management) with G/L Accounting and Accounts Payable (from Financial Accounting) and Cost Center Accounting (from Controlling).

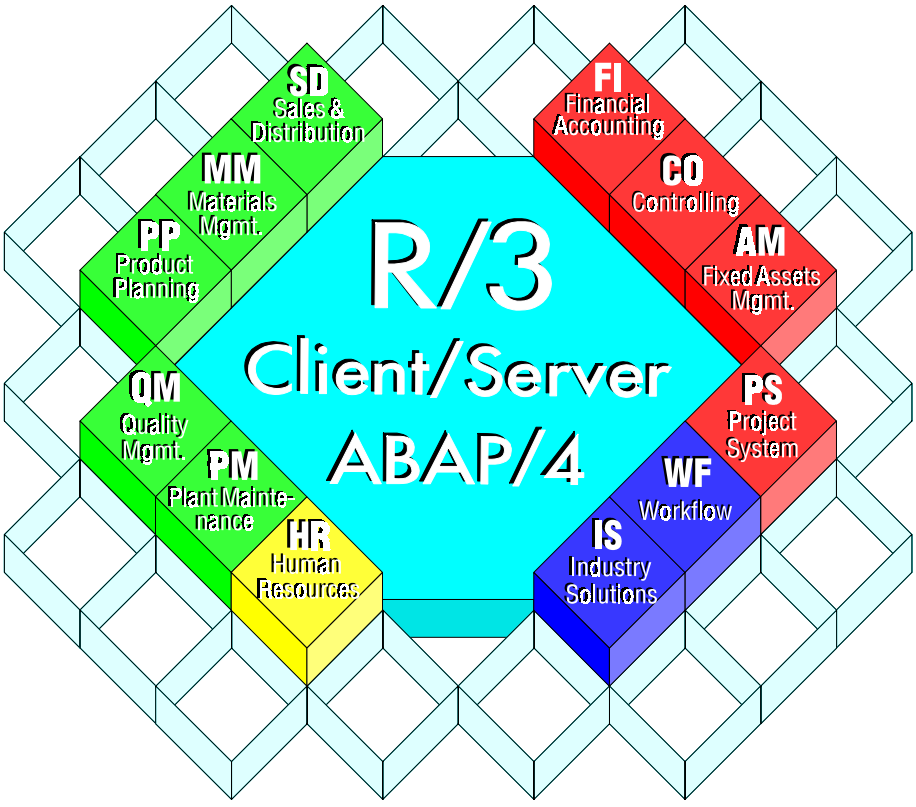

Fig. A-2: Integration Model

This integrates the uniform processing of external services with a reconciled system of G/L accounting and an up-to-date system of overhead cost management.

Integrated Development System

SAP's R/3 standard application software enables you to meet the demands of your company's business environment by selecting the modules and standard functions you require.

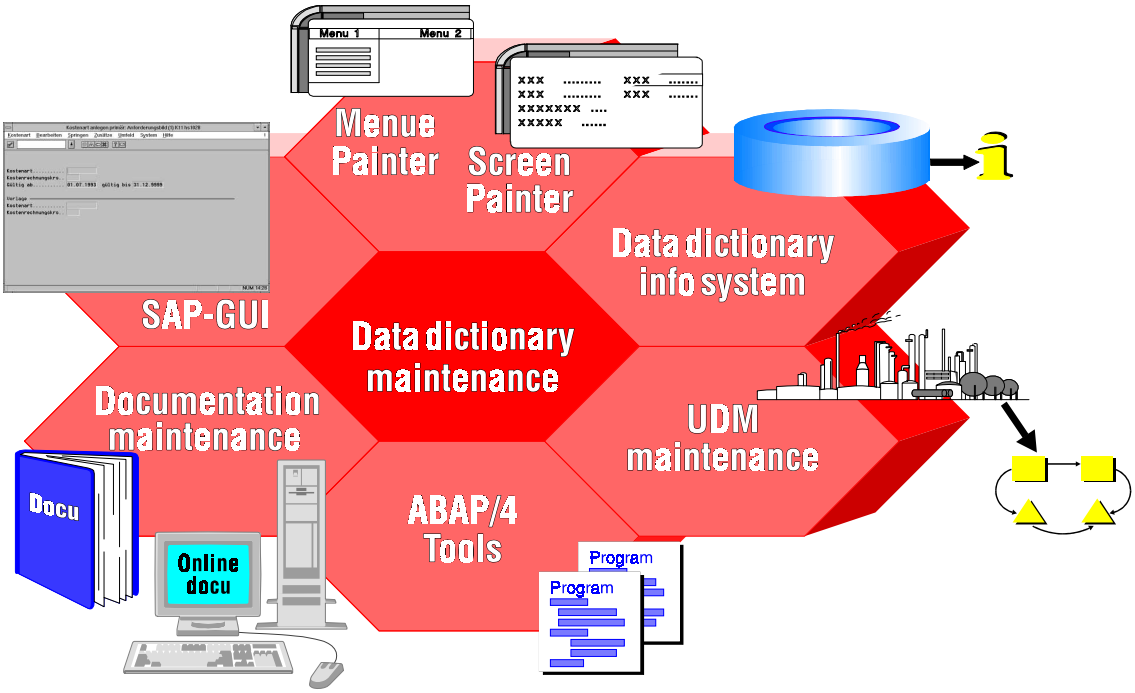

Fig. A-3: Components of the R/3 Development System

To incorporate even greater detail on specific company characteristics, R/3 software includes a fully integrated development system complete with a wide range of useful technological components, such as:

Tools

- an active Data Dictionary with a comprehensive administration and information system.
- ABAP/4, a sophisticated 4th generation advanced business application programming language.
- tools for creating and structuring screens and online processes (Screen Painter, Menu Painter, SAP-GUI).
- the enterprise data model as an aid in optimizing system structure and online functions.
- other application-oriented components, such as documentation.

You have the full functionality of the R/3 Development System at your fingertips. You can realize any additional requirements using the uniform development standards.

Interfaces

One question often raised when implementing standard software is how to get information to and from external systems. In the SAP software, data is transferred from external feeder systems using online processing techniques. This enables external dialog or batch programs to communicate with the SAP Systems via specific interfaces, such as Online Data Communication (ODC), Batch Data Communication (BDC), and Common User Programming Interface (CPI-C).

What are the main benefits of SAP's R/3 System?

The use of client/server architecture, R/3 application modules, and the development system and modification concept is specific to one particular company guaranteeing maximum benefit from the software.

Ergonomic User Functions

Individual Authorization Concept

User Master Data

The question of data security and the allocation of appropriate access authorization is an important one in any software system. In the SAP R/3 System, each user has a user master record that you can set to permit or restrict access to the following:

- online transactions
- clients, companies, business areas, plants, and so on
- tables and data objects (G/L accounts, customers, vendors, reporting system, and so on).

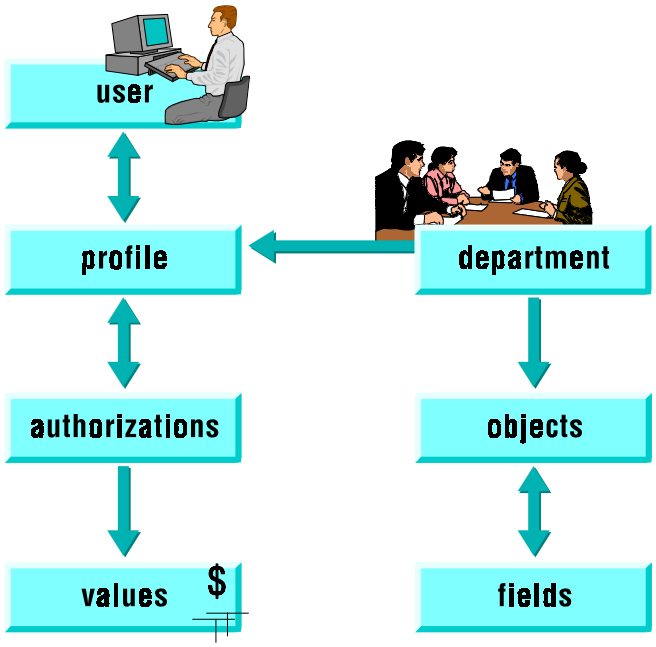

Fig. A-4: Authorization Concept

User Profile

SAP's authorization concept recognizes a range of different authorization groups (or profiles) which are stored together by work center. Most authorizations allow the user to access specific data, for example material, asset, or project master records, or data assigned to a specific organizational unit, such as a company or cost center. You maintain these authorizations for the profiles, and not for individual users.

Any changes you make are immediately valid for all the employees assigned to the profile concerned.

User-Oriented Guidance

The R/3 System offers the full range of functions required at the modern, dialog-oriented work center.

Matchcode

This means supporting the system functions (word processing) and making them easier to use (search function = matchcode), as well as networking all the individual applications using suitable service functions to create a uniform system of application-based user guidance (Mail system, and so on).

Menus

The most important elements involved are:

- standard menu sequences for selecting and using individual functions.
- screen structure which is flexible with respect to the type, arrangement, and content of individual fields and screen sequences.
- standardized or individual selection using flexible matchcodes.
- interactive graphics for editing the online reporting system.
- integration of optical archives for original documents using screen-based multi-media technology.
- various methods of communication (R/Mail, EDI, telecommunication, office communication).

The components mentioned above are either included in the functionality of the standard software (for example, matchcode function), or can be added to the individual application components.

Multi-Level User Documentation

Although the graphic user interface is largely self-explanatory, it is backed up by consistent and clearly written paper documentation.

Online Documentation

The documentation is divided into implementation guidelines and end user manuals, depending on the tasks being performed (clerk, installation engineer). The objective of the R/3 System is to combine online and paper documentation to offer maximum support to the user. You can, for example, search for a particular documentation element online and print out all related texts and notes which could be of help in solving a particular problem.

There are various types of documentation which differ in content as outlined below:

- field documentation on data elements, error and system messages.
- online implementation check lists.
- extensive conceptual discussions, examples, and system application functions.

Online documentation can combine all the various types interactively on the screen (from field descriptions, via extended conceptual notes to glossary definitions). In addition, you can access particular documentation elements via hierarchical structures.

What are the benefits of the work-center-oriented features of the R/3 System?

Work-center-oriented data processing applications offer extensive data protection, as well as being easy to learn and simple to handle.

Installation Support

Organizational Preparations

The success of any R/3 software system depends on a variety of factors. The most important of these are planning and organizing the implementation project and establishing exactly what the customer requires of the R/3 System. Before planning the implementation, you must have a clear idea of the business solutions you want covered, the number of R/3 modules you want to implement, the type and extent of the system functions you require, as well as the number of employees involved. When you start planning the project, you should invite data processing experts and employees who will eventually work with the system to join your project team.

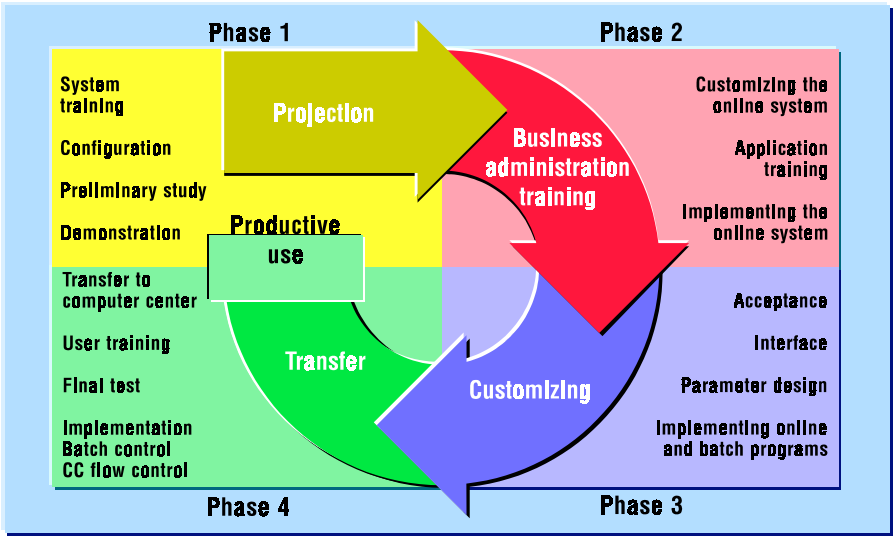

Fig. A-5: R/3 Implementation

Company Organization

The design of the R/3 System means it can be installed quickly and economically. A prerequisite for this is that your project team is suitably qualified and that you have clearly established the functions you require. To support these aims, SAP provides a range of functions and services across all the individual components of the R/3 System. These are designed to improve efficiency both during implementation and when the system goes productive.

Enterprise Data Model

The enterprise data models (SAP-UDM) are used to transfer real world conditions into a clear, feasible, and structured representation of your data organization. All the elements, relationships, and descriptions you need are

stored in the active Data Dictionary. The resulting integrated company model helps ensure that your data base is complete and consistent, and means that you can access the structure at different levels. From the predefined structure of the SAP-UDM, you can model the data structure for your own company using the organizational units predefined by SAP.

Client

The most significant of these organizational units are the client and the company. The client is a system-based organizational unit and guarantees that centrally defined transactions and posting rules are used consistently. The client can be used to represent a whole group of companies, although you can still define group structures across several clients using "company IDs".

Company/ Business Area

The company represents an independently balancing organizational unit. Companies can be further subdivided into smaller organizational units, using the business areas from Financial Accounting. The business area is a non-independent organizational unit within a company. You can store, manage, and evaluate figures for monthly debits and credits and operating results (P&L) internally using the business area. Using internal allocation, you can use business areas to cover any internal profit-based organizational units (such as division, plant, sales organization, and so on).

Allocation Group/ Planning Group

In addition to structuring your organization into companies and business areas, you can define allocation groups and planning groups (controlling, profitability analysis, valuation) to reproduce a more detailed organizational structure. The actual document and data flows are based on the central organizational units, combined with logistical units (such as plant, storage location, etc.) and posting information (such as account, cost center). You will find the enterprise data model for the Cost Center Accounting module at the end of this book.

Implementation Support

System Installation

SAP's System Implementation Guide (IMG) provides invaluable aid when you are installing an R/3 System. A well-organized list of all the individual functions lets you decide which components are relevant to your requirements. In addition, IMG provides you with a detailed plan of action for setting up the individual functions, and clearly illustrates interdependencies and links between the integrated software modules.

Using the online plans of action, the system leads you through the system configuration process. You can call up the individual functions for entering system parameters direct from the IMG System. You can also call up detailed documentation online at any time when using IMG. This means that, when configuring the system, you have all the system functions, as well as extensive documentation at your fingertips.

Customizing

By "customizing", we mean the modification of the standard system to suit the specific business requirements of a particular installation. To do this, the internal organization of your company and the predefined structures in the R/3 System must be brought into line. This involves the internal organizational structure of your company, as well as the business processes you use.

Customizing basically involves defining the content of your R/3 System to suit your needs. By allowing you to simultaneously maintain multiple control parameters, customizing enables you to reconcile the many functional dependencies within your organization.

System Configuration

Complete Integration

In addition to the application software itself, the SAP functionality encompasses all tools and activities required to support the installation, productive use, and further development of your R/3 System.

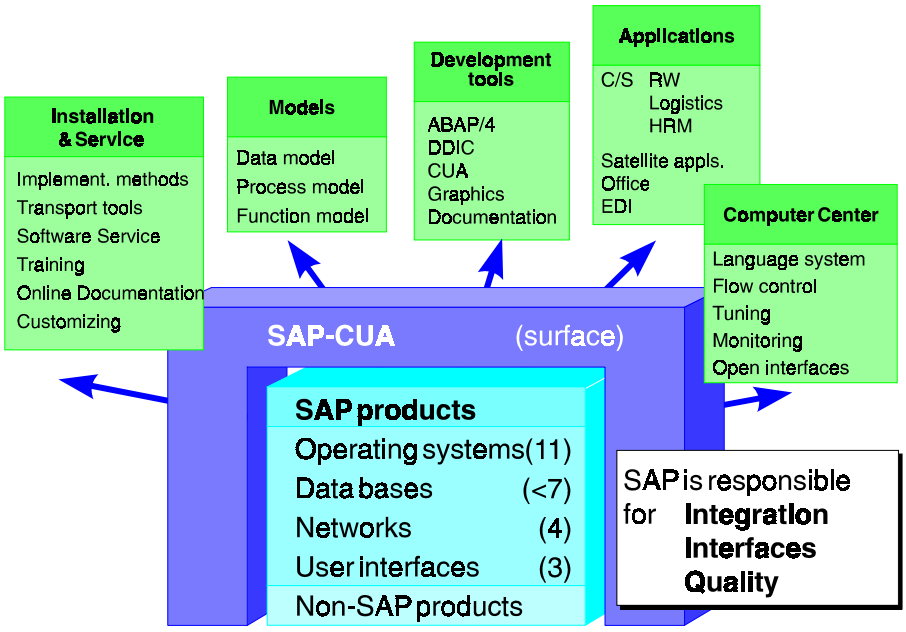

Fig. A-6: Complete Integration with SAP R/3

This guarantees functional consistency and integration of methods across all components, as well as complete integration into open systems.

How is the economical installation of the R/3 software ensured?

The flexible combination of organizational, data processing, and application-based functions guarantees the efficient installation of SAP's R/3 System.

Additional Features

Worldwide Support

Since its foundation in 1972, SAP has developed into one of the largest independent software houses in the world. With branch offices all over Europe, North and South America, in South Africa, South-east Asia, and Australia, the company can guarantee uniform customer support around the globe. In addition to the sophisticated data processing technology used, the comprehensive SAP software systems provide complete business application solutions.

User Groups

The market for the R/3 System covers a wide spectrum of users:

- group headquarters
- group subsidiaries
- medium-sized companies.

Common to all these different types of user is the demand for a wide-ranging business functionality, as well as an expansion of the integrated, business data processing technology and enhancement of international and multinational functions.

Development and Maintenance

New Developments

SAP offers the wide range of business functionality in the R/3 System in the form of modern data processing solutions. Customer requirements, national and international regulations, and new concepts in business management, mean that the functionality of the system must be continuously enhanced. This means recognizing new trends early, and realizing them as standard software solutions, often at very short notice. Before new developments or enhancements are released for sale, they are thoroughly tested in pilot installations at carefully selected sites.

SAP provides a comprehensive and reliable maintenance service which guarantees the stability of the individual software modules.

Price

Uniform Price Structure

The installation and use of R/3 modules must also be within the bounds of economic feasibility. The uniform price structure, modular organization of the system, and prices related to the size of the installation and customer concerned ensure that every potential R/3 customer can see the costs likely to be incurred for the software. This allows you to plan the costs both for the initial installation and for any subsequent enhancements fairly exactly, based on the business requirements of your company.

Support Services

Services

SAP also offers a wide range of support services to help you decide how R/3 can best be used to meet your particular data processing needs. These services include:

- advice when deciding on the modules required
- comprehensive training in all system components
- consulting services during implementation and application
- miscellaneous services, such as telephone hotline, written problem, and so on.

These services strengthen still further the economic viability of installing and using SAP software.

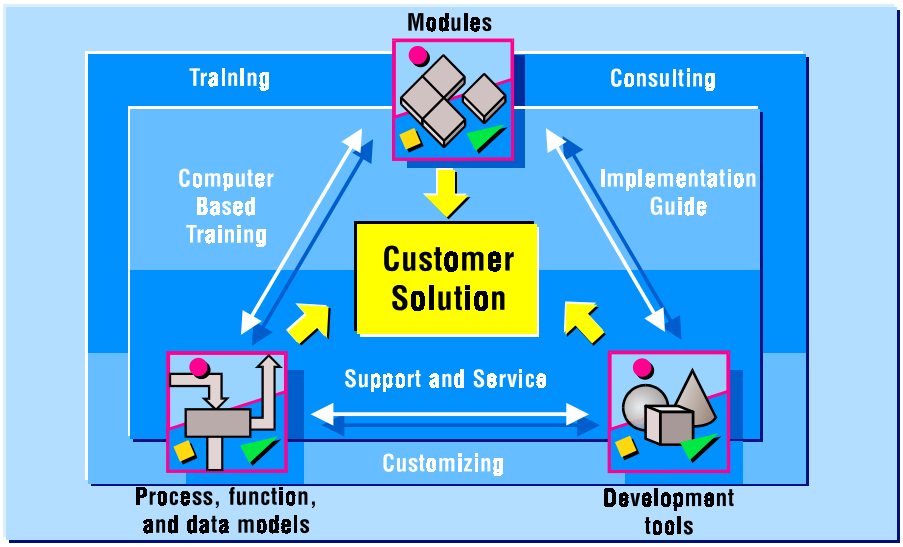

Fig. A-7: Integrated Customer Solution

You can use the various services on offer individually. The SAP support services guarantee that price, deadlines, and content are all tailored to suit the requirements and budgets of your particular company.

How does SAP guarantee the successful installation of its R/3 software?

The international orientation, continuous enhancement, and extensive support ensure SAP software meets all the requirements of companies looking to invest in the future.

next chapter