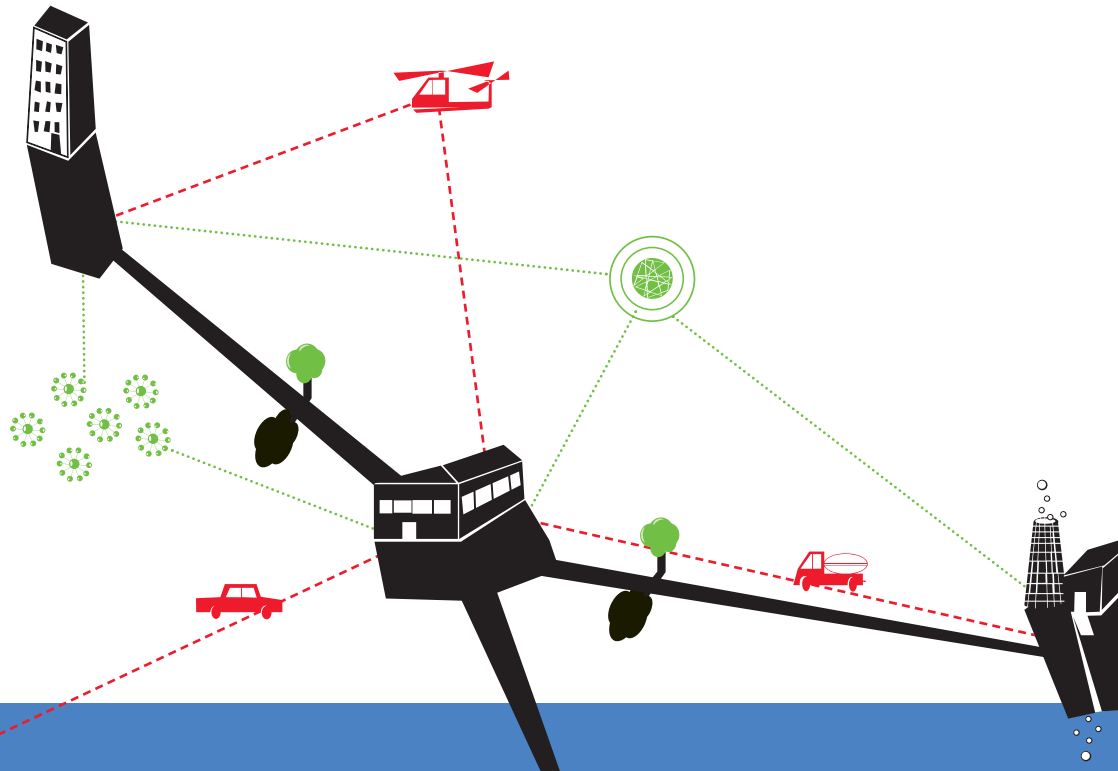


Solutions and services



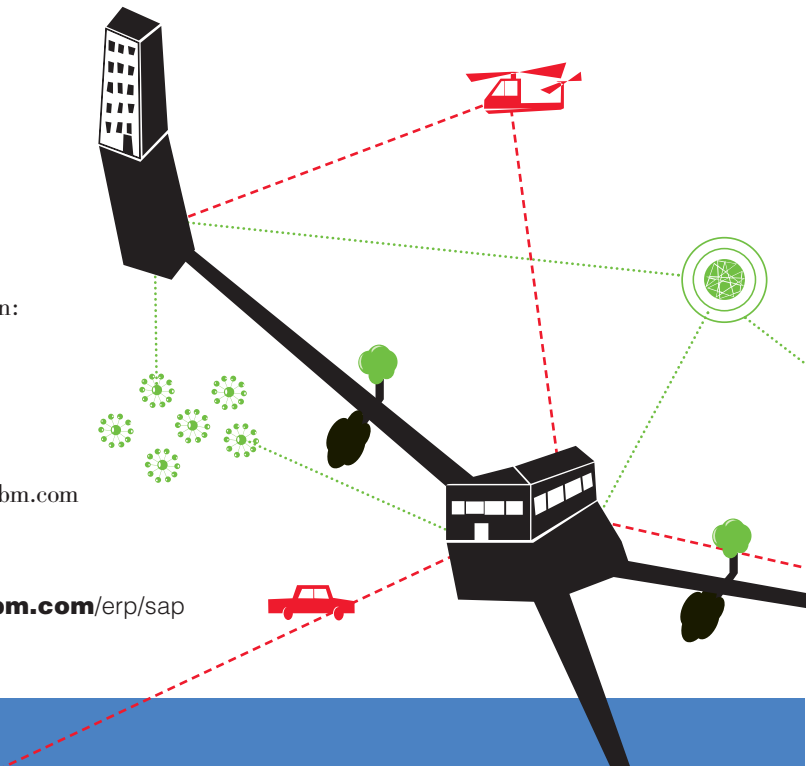
IBM – Your Partner in the SAP



2001 edition

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IBM and SAP – A strong alliance



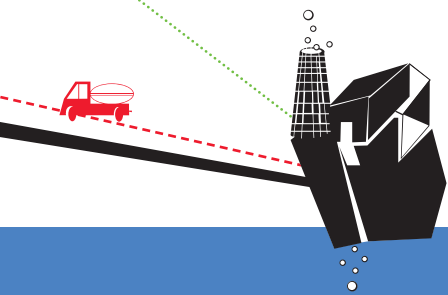
Worldwide, IBM is the leading provider of platforms, consultation and other services for information technology. IBM is also a world-wide leader in the SAP environment. Both companies are bound by a close alliance that actively facilitates and supports employees of IBM and SAP, partner companies and customers around the globe. It is not only from a technological standpoint that customers benefit from this close alliance. They also benefit in all of the areas unique to the successful introduction of SAP products.

The IBM SAP International Competence Center (ISICC) is a department at the headquarters of SAP in Walldorf, Germany, that is staffed jointly by IBM and SAP employees. Under its leadership, international and domestic Competence Centers provide optimum support for all those who are actively engaged in our customer projects.

A glance at the customer base of SAP and IBM reveals the close technological ties that linked the two companies in the past. More than 6,000 customers worldwide use the SAP application software SAP R/2, R/3 and mySAP.com on IBM computers together with IBM products.

The basis of this success is, on the one hand, that SAP contributes the globally accepted mySAP.com applications while, on the other hand, IBM ensures that these applications are implemented and integrated for optimum performance in the customer environment. As your business ally for technology, platform and engineering design, IBM can concentrate fully on the existing customer environment and customer-specific requirements while creating the optimum solution for the customer at the same time.

It is especially our customers with international ties who value the advantage of their IT solutions no longer being limited by national borders. Instead, their applications can be linked both domestically and internationally in any desired integration level.



SAP AG with its headquarters in Walldorf, Germany, is the largest supplier of integrated business solutions in the world. The application portfolio includes commercial standard application software covering the entire spectrum of business management functions. The individual applications are realized as modular “building blocks” founded upon a base system.



The standard software created by SAP controls the overall flow of quantities and values of a company as an integrated solution. The modular set-up enables each individual component to be used separately or in any commercially practical combination. In addition, SAP provides software solutions for particular business requirements (e.g. Business Warehouse, Customer Relationship Management etc.), which can be implemented with mySAP.com as well as with products from other manufacturers. Furthermore, SAP offers industry-specific solutions based on mySAP.com that take account of the special

requirements of the customer's industry and facilitate a mySAP.com implementation tailored to needs.

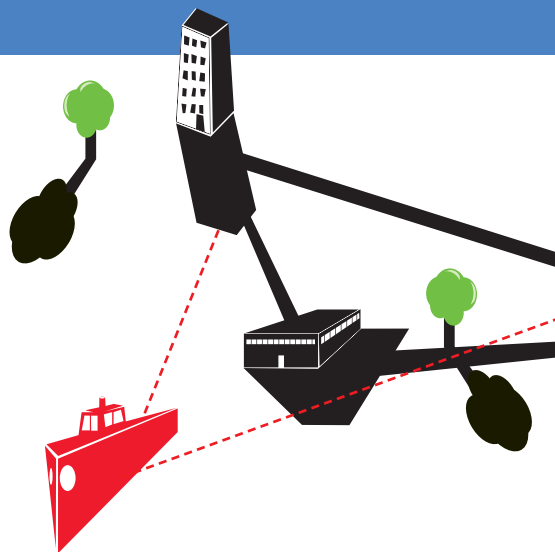
As part of the close cooperation between both suppliers, SAP will concentrate on the application software for increasing productivity and IBM will concentrate on the development and realization of the customer solution.

As the architect of the information technology, IBM offers complete SAP solutions that include the hardware, software and services. Under the heading “connections united – business solutions by IBM and SAP” we propose to bring together all the system components, all the relevant functions and all of the partners involved in the project and to contribute partly or fully towards the success of the SAP projects of our customers. We see this as providing proficient consulting for the introduction of all mySAP.com applications and the implementation, operation and financing of SAP systems, including training, maintenance and modernization for existing systems.

At the customer's request, IBM will assume the overall responsibility for complete projects, both in Germany and abroad. The complete package may include guarantees for completion schedules, overall pricing, functionality and quality.

As a result of our many successful customer projects, and from the experience we have

gained with SAP R/3 and mySAP.com within our own corporation, we know and understand the environment and the technical benefits of using IBM hardware and software subsystems in conjunction with SAP. It is on this basis that we are able to design the optimum solution for each individual customer. It is especially for questions concerning the installation of SAP R/3 and mySAP.com, the interconnection of both systems via Application Link Enabling (ALE) or the migration of SAP R/2 to mySAP.com that IBM should be your first stop. We have expertise in both SAP application environments and their system platforms and can therefore provide our customers with the best possible advice. The decisive factor is that IBM does not simply place these solutions alongside previous systems. Instead, we always seek to design a total solution.



Our goal is to incorporate existing systems and to protect the previous investments of our customers. In other words, we strive for the optimum client/server solution with the best possible system administration, reliability and performance.

Do you wish to

- **expand your existing applications by adding additional functions?**
- **modernize your existing applications?**
- **adapt your business solutions to your processes more effectively?**
- **replace your existing applications with a standard solution?**
- **link your domestic and international branches together ?**
- **analyze and improve your business processes?**
- **complement your existing application concept by implementing mySAP.com?**

Contact us. We can provide your solution.

The range of IBM products stretches from mainframes to PCs. The server selected depends essentially on the requirements for performance, security and end user support. IBM is the only supplier in this field that can work together with the customer to find the best solution, as SAP software runs on all series of IBM @server and with all important IBM software products, with hardly any restrictions.

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IBM – The solution partner for SAP users

1.1 Our primary areas of emphasis in the SAP environment

Today, information processing is an essential instrument for supporting strategic corporation objectives and for improving your ability to compete effectively.

Applications are evaluated not only based on their functionality, but also on how well they can be integrated into the existing environment. In other words, once data and information have been entered, they can – if authorized – be used by everyone. As a result, the demand for supporting consulting and services has also significantly changed, and – all encompassing conceptual designs and solutions are increasingly in demand. IBM's consulting and service offerings are based upon this strategy of providing comprehensive solutions.

Starting from the initial strategic consulting for the implementation of corporation objectives; their mapping in the architectures of information processing; extending to planning, implementation, day-to-day support and optimization; up to a complete takeover of all IT activities – IBM will generate the right offer for every need.

In order to better incorporate the requirements of our customers, we have based our organization along industry lines. In other words, throughout the entire process – from

proposal to implementation – you will be supported by SAP Consultants who can understand and implement your industry-specific requirements.

Our objective is to ensure that our customers are given expert consulting from a single source, and that they are offered the very best in total solutions, tuned to meet their individual needs. SAP Services from IBM Global Services ensure a consistent approach in SAP implementations across the entire sales process.

SAP Services utilize methods and tools which are used as standard around the world for carrying out domestic and international projects. SAP services offer the complete range of consulting and services which are an integral part of an SAP total solution. Our consulting covers the initial technical plan, the SAP plan, implementation and customization, setting up the interfaces and modifications, and the automated operation of SAP applications including training and maintenance. i.e. everything that is required to provide the customer with a total application solution based on globally accepted quality standards. Expert support is available locally, regionally and internationally.

IBM's professional project management and expertise in system integration enable it to assume overall responsibility for complex SAP projects, both in the SAP R/2 and mySAP.com environments. The customer is

provided with a total solution by a single source.

The worldwide networking of economic areas is reflected in a continually growing demand for application systems that are not restricted by domestic borders. The worldwide presence of IBM and the jointly-managed IBM SAP International Competence Center in Walldorf (ISICC) provide the ideal basis for the implementation of international IBM SAP projects with the best expert customer support.

In our sales sectors, the customer is provided with dedicated SAP sales specialists as contact persons. Working closely with you, we will develop the right solution concepts for you and will help you to put your objectives into practice. Using the IBM @server available today, the broad spectrum of IBM software solutions, and IBM Global Services, we can provide the solution concept to suit your individual requirements.

As a result of the cooperation between IBM and SAP, customers receive a product combination from leading providers. They thus protect their investments and gain additional security. IBM is SAP's largest partner, represented in all the relevant areas. The decision to place your trust in IBM products and services in the SAP environment is a decision for the future in terms of availability and the application of matured products and their enhancements.

1.2 The mySAP.com e-business platform

1.2.1 The mySAP.com system and its benefits

mySAP.com from SAP is a standard software package with a modular design. It supports all of the business management procedures in a corporation and links them by means of real-time integration: sales and marketing, production, materials management, accounting and human resources management form a coalesced organizational unit that spans all departments. An integrated solution means that mySAP.com uses a technological architecture and a relational database universally for all applications. In other words, once data and information have been entered, they can – if authorized – be used by everyone. This cuts down on time being wasted through the same data being entered again and again – a shortcoming in systems which are not designed on a uniform concept.

mySAP.com is based on four main elements:

- **mySAP.com Marketplace:** These are a commercial forums on the Internet. The mySAP.com Marketplace supports cross-process economic cooperation (c-business), digitized trade, personalized information access and communication in networked business communities. Inter-company procurement and transfer of information is made significantly easier.
- **mySAP.com Workplace:** An Internet portal that heavily involves employees, customers,

vendors and other partners of the company in business processes. The mySAP.com Workplace is a customizable, role-specific desktop providing personalized, uniform access to everything that the owners of the various company roles require to perform their tasks efficiently.

- **mySAP.com Business Scenarios:** Alignment to the areas e-commerce, Customer Relationship Management (CRM), Supply Chain Management (SCM), Business Intelligence (BI) as well as Product Lifecycle Management (PLM).
- **mySAP.com Application Hosting:** This external provision of mySAP.com applications reduces the risk, time and investment involved in entering the c-business arena. A specialized service provider provides a complete software solution or part of one for use across the Internet; the implementing company does not operate the software itself. This saves on expenses for hardware, system maintenance and administration.

In the network, the above elements enable cooperative business scenarios. The user accesses the solutions across the Internet via the mySAP.com Workplace. The user cannot see whether the software is operated fully or in parts from his or her own company or whether it is provided externally per Application Hosting. The basis of mySAP.com is the Internet Business Framework, a solution architecture that is flexible, scalable, powerful and robust, making it outstanding as an open

and reliable platform for cross-company process integration.

1.2.2 The client/server architecture of mySAP.com

From a technical point of view, every application system may be broken down into the three task areas of presentation, application logic and data holding. In the mySAP.com architecture, these areas can be easily recognized.

The processes here can be distributed on several computer levels: Presentation and dialog functions take place at the work place on PCs or small workstations. The application logic runs on application servers. The relational database manages and coordinates the common database to which all users have access.

With small to medium-size installations, database and application servers are implemented in a single system, while existing PCs can be used as workstation computers.

In larger installations, the database server and the application server (or multiple application servers) can run on dedicated machines; special application areas (e.g. Business Warehouse, CRM, etc.) are run on dedicated servers. External locations which are accessible only via a telecommunication network are connected to central application servers. Communication between the mySAP.com computers is generally established via TCP/IP – even for PCs running on OS/2 or

DOS. Token Ring or Ethernet can be used for the LAN and X.25 (Datex-P) or ISDN for the WAN system. If database and application servers are implemented on different types of computers within larger installations, the installation of an ATM network or Giga-Ethernet is recommended.

In principle, the configuration of the IT environment is based on operational requirements and the individual objectives of the users. The IBM range is flexible enough to enable it to be adapted to the special, detailed needs of our customers without the need for compromises.

1.2.3 Industry solutions for mySAP.com

SAP industry modules are available to meet the special requirements of individual industries. These modules make it possible for the customer to realize their industry-specific functional requirements more simply and quickly, without being forced to compromise on their specific needs. SAP also offers what they refer to as “Solution Maps”. These are blueprints which represent the complete business solution with all specific business processes related to mySAP.com. These “Solution Maps” are intended to support the customer in the implementation of the industry-related functions of mySAP.com.

As SAP's business partner, IBM participates in the engineering design of various industry modules and contributes the knowledge and

experience it has gained from thousands of worldwide installations to the design process.

1.2.4 The mySAP.com Internet technology

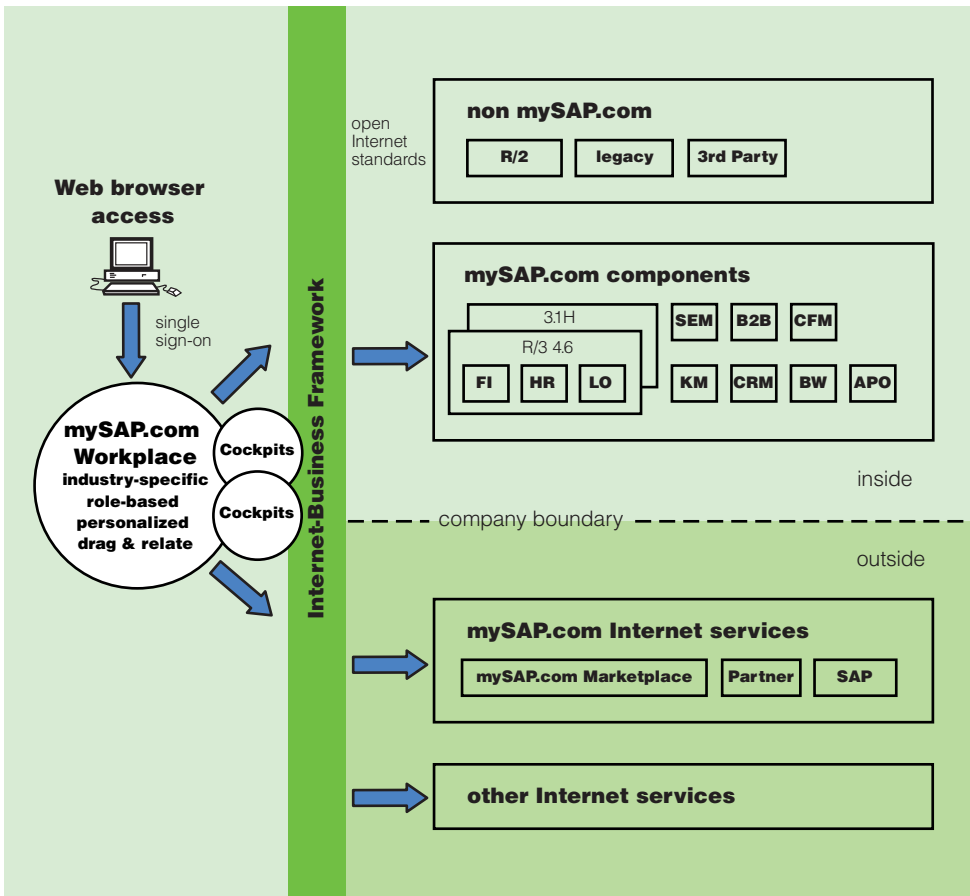
mySAP.com is a development of various technologies. The traditional SAP R/3 system with its associated business scenarios has been expanded to include cooperation and collaboration. The SAP Business Framework forms the background structure; BAPIs guarantee access to the relevant Business Objects. In addition, the SAP Internet Business Framework and an XML capability open up the possibilities of the Internet for the overall system. The new, user-friendly design of the mySAP.com Workplace came about as a result of the “enjoySAP” initiative.

mySAP.com has fully Internet compatibility, thus enabling access to all SAP functionality and all business processes and data from the Internet. As a result, Consumer-to-Business and Business-to-Business scenarios can be implemented. The Internet components in mySAP.com consist of the browser, Internet Web Server, Internet Transaction Server (ITS), Internet Application Components (IACs), Business Application Programming Interfaces (BAPIs), SAP Automation, Firewalls and SAPGUI in the Java Standard. The multi-platform access is also enabled by the JavaGUI. The use of standard Web browsers (Netscape, Microsoft, etc.) decisively expand the access options to the mySAP.com world over the Internet Web server.

The **mySAP.com Workplace** provides users with full access to all the applications and resources they need for their tasks. These can be one of more SAP R/3 or mySAP.com systems or the e-business applications in mySAP.com (such as e-commerce, CRM, BW), but also other applications and resources within and outside the company's own network. Using the Workplace, partner companies and customers can also enable tailored

user access to their applications. For users, it becomes transparent where the application is located and whether they are moving within or outside the company network.

The mySAP.com Workplace is based on SAP R/3 base technology, using an Internet browser as its user interface. The mySAP.com Workplace Server as a background application controls the user management, administration of user accesses and the infrastructure. The



Workplace Server works with all mySAP.com components as well as with SAP R/3 as of version 3.1H, and even with non-SAP applications.

The foundation for SAPs software products is the Business Framework. Standardized interfaces and methods for transferring data make it possible to transmit data both between various mySAP.com systems as well as between SAP/R2, SAP R/3 mySAP.com and other components and software systems (e.g. SAP Business Warehouse, but also products from other manufacturers). The Business Framework also allows the easy insertion of additional components with expanded functionality and decentralized maintenance.

Based on the technology of the SAP Business Framework, the SAP Internet Business Framework enables development of open e-business solutions on the de facto standards XML and HTTP. With the Internet Business Framework, SAP has an infrastructure for secure and reliable message and data interchange on XML basis. The SAP Business Connector, which supports the interface and the format of the messages such as BAPI or IDOC, but also other formats from other manufacturers, is used to achieve this.

1.3 IBM and mySAP.com

As the architect of the information technology for the area of mySAP.com, IBM offers complete solutions that include the hardware, software and services. We propose to bring together all the system components, all the

relevant functions and all of the partners involved in the project and to contribute partly or fully towards the success of the mySAP.com projects of our customers.

All IBM hardware and software products support the mySAP.com components or are integrated in them, as the case may be. This makes it possible for us to provide our customers a tailored solution, even for the most complex installations.

1.4 SAP R/2

SAP R/2 is a standard business management software package that is optimized for main-frame systems. It is distinguished by its comprehensive functionality, outstanding integration depth and international usability. The application portfolio includes the areas of finance and accounting, warehoused distribution, production planning and controls, materials management, plant planning, quality assurance, human resources and project management.

The demands made upon operational and DB/DC systems as a result of ongoing enhancements to the SAP R/ 2 applications are incorporated into the new designs and enhancements of IBM systems in the specification, design and testing phases. SAP is also given access to specifications from IBM on a timely basis. It is therefore ensured that, when new operating system versions or new software releases are made available, all enhancements are also made available to individual customers.

IBM with mySAP.com availability

mySAP.com Component	IBM @server xSeries	IBM @server iSeries	IBM @server pSeries	IBM @server zSeries
Core R/3	available with WinNT/2000 and Linux	available	available	available*
mySAP Supply Chain Management				
Advanced Planning and Optimisation (APO)	available on WinNT/2000 (all components)	certain applications available (Live Cache, Optimizer NT)	available (Controlled availability), GA 1Q2001 (Optimizer NT)	certain applications available (Live Cache, Optimizer NT)
Business to Business Procurement (BBP)	available with WinNT/2000 and Linux (MW on WinNT/2000)	available (MW on WinNT/2000)	available (MW on WinNT/2000)	available* (MW on WinNT/2000)
mySAP Business Intelligence				
Business Information Warehouse (BW)	available with WinNT/2000 and Linux	available (MW on WinNT/2000)	available (MW on WinNT/2000)	available (MW on WinNT/2000)
Knowledge Management (KM)	available with WinNT/2000 und Linux (MW on WinNT/2000)	available (MW on WinNT/2000)	available (MW on WinNT/2000)	available with R/3 4.6B+ (MW on WinNT/2000)
Strategic Enterprise Management (SEM)	available with WinNT/2000 and Linux	available	available	available*
mySAP Customer Relationship Management	available with WinNT/2000 and Linux (MW on WinNT/2000)	certain applications available (MW on WinNT/2000)	certain applications available (MW on WinNT/2000)	available* (MW on WinNT/2000)
Industry Solutions	available with WinNT/2000 and Linux	available	available	available*
mySAP Workplace	available with WinNT/2000 and Linux	available	available	available*
ITS	available with WinNT/2000 WGATE available with Linux	not available	not available	not available

* The SAP R/3 Application Server is available for the zSeries with SAP R/3 Rel 4.6B and higher.

2 IBM Server Platforms for mySAP.com

Open systems are considered to be a key concept in the IT world at this time, as can already be seen with mySAP.com. As a result, there has been a growth in the demands that customers are placing on the platform. With IBM @server, the new generation of servers, IBM can provide the largest portfolio of mySAP.com **certified server platforms**:

- zSeries with **OS/390 and z/OS**
- pSeries with **AIX**
- iSeries with **OS/400**
- xSeries with **Linux** and the Microsoft operating systems **Windows NT/Windows 2000**.

The individual platforms are distinguished by significant features, each of which will take on a different importance depending on the customer's requirements.

xSeries

- peak performance with maximum control and highest availability
- IBM quality in the Windows 2000 environment
- superior value SSA disk peripherals
- scalable data backup with ADSM and IBM tape backup alternatives

iSeries

- established platform in more than 700,000 installations worldwide
- integrated system design and integrated DB2/400 relational database in

64-bit architecture

- easy to use
- high system stability
- outstanding scalability from 10 to 18,000 active mySAP.com users
- Preinstalled mySAP.com system (mySAP.com Preload)
- total package for simplified installation (Ready-to-Run).

pSeries

- binary compatibility, outstanding scalability from the mobile workstation up to the massive parallel System SP
- good price/performance indicators
- high availability extending beyond geographic borders (disaster recovery)
- problem-free handling of large data volumes
- ideal application server in conjunction with System/390 and zSeries database servers in the high-end mySAP.com environment.

zSeries

- certified as mySAP.com database server (max. 320 processors); generally available since July 1997
- superior performance and scalability from the uniprocessor up to the Parallel Sysplex (max. 320 processors)
- continuous operation possible with integrated hardware and standard functions in zSeries, OS/390, zOS and DB2
- support of extremely large data volumes by means of tools contained in DB2 for OS/390

IBM platform characteristics

IBM @server	IBM @server zSeries	IBM @server pSeries	IBM @server iSeries	IBM @server xSeries
mySAP.com Certified Databases	DB2 for OS/390	DB2 UDB Informix, Oracle Adabas	DB2/400	Oracle, Informix, SQL Server, Adabas DB2 UDB
Dependence on software versions	Release 3, and higher of OS/390, DB2 for OS/390 version 5.1, Release 4.0 and higher of mySAP.com starting at 3.1H, Release 4.6 and higher of OS/390 rel. 2.5, OS/390 rel. 2.8	AIX DB2 Oracle 8	integrated into OS/400	Windows NT Windows 2000 3.51 and 4.0, DB2 Oracle, Informix MS SQL Server Adabas Linux
System Management Toolset	SystemView, Tivoli Manager for R/3	Tivoli NetView for AIX/ AMS Module, mySAP.com Appli- cation Manager	Tivoli, Netfinity IBM System View, Perform- ance Tools, OS/400 functions	Netfinity Manager Tivoli Microsoft SMS
High availability/ backup & recovery	Clustering, Parallel Sysplex/ implemented in all DB2 GEOPLEX	HACMP, HAGEO ADSM	OMS/400 MIMIX/400 Data Mirror BRMS/400 ADSM Image Plus	Microsoft Cluster Server/ADSM ADSM Connect Agent
Printing	Info Print Manager for OS/390	OTF to AFP- converter, InfoPrint	OTF to AFP- converter	Print functions integrated into Windows NT
Type of end user access	TCP/IP	TCP/IP	TCP/IP	TCP/IP

IBM guarantees its customers that they will be able to meet a large number of their requirements by choosing a platform with the characteristics mentioned above.

- IBM and SAP have announced availability of mySAP.com for Linux on zSeries
- Use a application server with OS/390. With the possibility to place critical components (e.g. Message, Enqueue) on the host, as required
- significant increase in performance for batch processes under OS/390.
- Depending on the customer requirements, further components (e.g. print control) can be configured up to complete application on the OS/390 system.

2.1 mySAP.com on IBM @server xSeries

In connection with the **Intel-based** xSeries and **Netfinity** servers, mySAP.com offers a clear competitive advantage for the automation of business processes and sales administration across the company. xSeries and Netfinity systems provide the reliable basis with regard to performance, scalability, control and service that is required for the mySAP.com applications.

The level of performance of the IBM servers with Intel processors is so high that businesses of all types and sizes can run their critical 7 x 24 x 365 business applications more reliably.

Depending on individual needs, requirements in terms of performance, scalability and control are fulfilled using the relevant products from the xSeries and Netfinity family. The servers also have system administration processors, a fault-tolerant working memory and **hot swap functions** for fans,

power supply, hard disks and PCI adapter boards to ensure the highest availability possible.

A broad spectrum of **SAP-certified xSeries** and Netfinity Servers is available for this purpose.

- IBM @server xSeries 230
with 2-way Pentium III 1GHZ and up to 4 GB main memory
- IBM @server xSeries 240
with 2-way Pentium III 1GHZ and up to 4 GB main memory
- IBM @server xSeries 330
with 2-way Pentium III 1 GHZ and up to 4 GB main memory
- IBM @server xSeries 340
with 2-way Pentium III 1GHZ and up to 4 GB main memory
- Netfinity 6000R
with 4-way Pentium III Xeon 700 MHZ and up to 16 GB main memory
- Netfinity 7100
with 4-way Pentium III Xeon 700 MHZ and up to 16 GB main memory
- Netfinity 7600
with 4-way Pentium III Xeon 700 MHZ with up to 16 GB main memory
- Netfinity 8500R
with 8-way Pentium III Xeon 700 MHZ and up to 16 GB main memory

In various performance tests in the SAP environment, the xSeries and Netfinity servers have shown convincingly that they are among the fastest in the marketplace.

As a result of the significant degree of innovation in the area of processor development, we can also expect to see systems with even higher performance in the future.

The demand for high availability in the mySAP.com environment has been met by using **cluster solutions**. Unplanned downtimes due to hardware or software faults are significantly reduced. In the event of a failure, a different server within the cluster automatically takes over the work of the failed system.

Microsoft Cluster Server (MSCS) is the SAP based cluster solution for Windows NT. Here, MSCS monitors the mySAP.com database and the central instance. With MSCS, these fail-safe, **high-availability solutions**



are made possible on Windows NT. The mySAP.com kernel has been adapted for installation with MSCS. DB2, Oracle and SQL-Server can be implemented as databases.

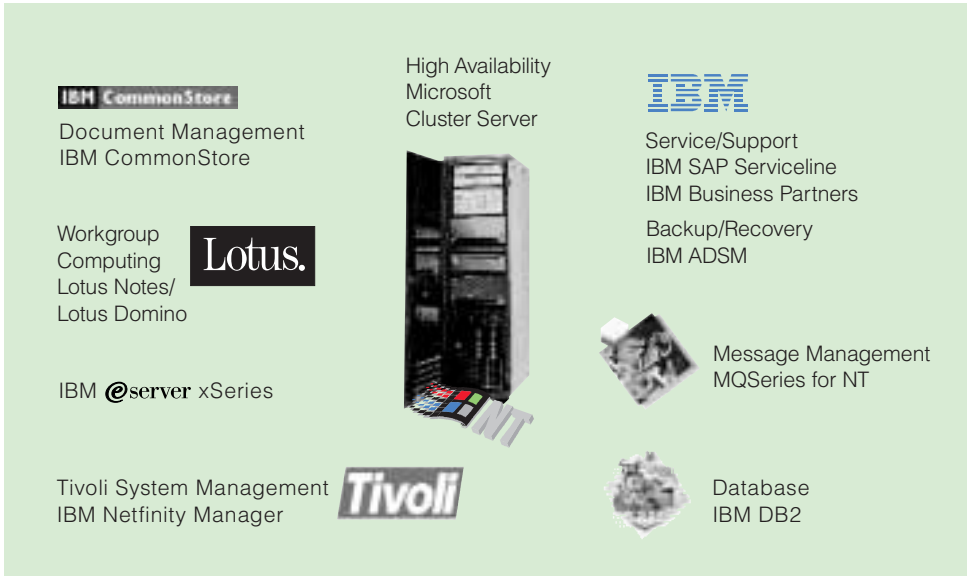
Furthermore, the ServerRAID (SCSI), SSA and FibreChannel xSeries and Netfinity disk subsystems are also supported in the cluster for mySAP.com. Storage subsystems that correspond to the corporation's requirements are available in various forms in the mySAP.com environment.

- **Ultra2 SCSI**, a solution with an especially favorable price/performance ratio for small and medium capacities
- **Serial Storage Architecture (SSA)**, a solution with high capacity and versatility for bridging greater distances at high performance levels
- **FibreChannel**, a solution for the highest capacity, versatility and reliability over large distances
- **Enterprise Storage Server**, an intelligent storage consolidation system of the highest performance

In addition, **tape systems** with especially high performance, reliability and high storage capacity can be integrated into the mySAP.com environment. These include DLT and Magstar Robots.

Microsoft Windows NT and Windows 2000 are offered as reliable 32-bit operating systems for business critical applications in open client/server structures. They may be implemented in all areas, from a simple desktop in the network up to the application or database server. This standard solution facilitates the administration and use of the whole system and reduces the cost of service and support for the NT business network. Furthermore, it

The flexible IBM mySAP.com Windows NT/Windows 2000 solution



has a very high market acceptance and the required capabilities can be quickly established and widely distributed.

Linux is also becoming increasingly important in the mySAP.com environment as a further operating system. This free UNIX derivative is currently offered with Red-Hat Distribution 6.X for mySAP.com on selected xSeries and Netfinity servers.

2.2 mySAP.com on IBM @server iSeries

Since September 1995, SAP R/3 and the later mySAP.com have been running successfully on IBM AS/400 and now on IBM @server iSeries. With this, IBM and SAP have introduced an integrated complete solution to the market – a product that meets

the customer's needs for a cost-effective total solution, as well as the need for a forward-looking and user-friendly client/server solution for use throughout the company.

With more than 700,000 installations in 120 countries since 1988, the iSeries is one of the world's most successful computer systems and thus a market leader for business computers in small to medium-sized companies.

mySAP.com on iSeries uses the high-performance PowerPC processor architecture and therefore runs as a full 64-bit application. The iSeries is the first system on which 64-bit applications run universally with 64-bit processors and a 64-bit operating system. CISC-based AS/400e programs can be imported directly on the RISC-based iSeries

without being recompiled while enjoying all the benefits of the 64-bit processor.

In addition to client/server applications like mySAP.com, 5250-based applications can also run on the complete iSeries product line. Additional 5250 performance can be pur-



chased for each feature code for use in the 5250 environment (e.g. for RPG based applications).

The iSeries server range comprises:

- IBM @server iSeries 400 model 270
- IBM @server iSeries 400 model 820
- IBM @server iSeries 400 model 830
- IBM @server iSeries 400 model 840

A uniform **OS/400 operating system** with an identical range of functions runs on all of the models listed here. OS/400 version 4, release 5

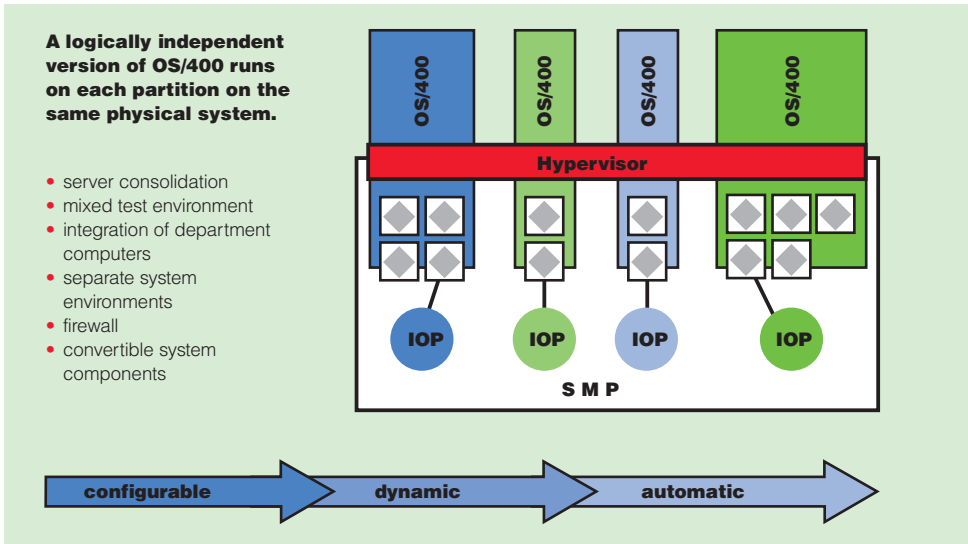
is required for the operation of the iSeries products.

From version 4, release 4 of OS/400 on, it will be possible to operate several independent OS/400 environments on an older AS/400e server (as of S model) or with OS/400 version 4, release 5 on iSeries with 2, 4, 8, 12 or 24 processors using **Logical Partitioning (LPAR)**. To do this, the system must be divided into defined processors, main memory and I/O processors in physically separate areas in which the respective OS/400 environments can then run. In the SAP R/3 environment you can operate test, integration and production environments or database and application servers, for example, in separate LPARs.

In order to activate additional system performance at short notice, on-demand processors can be ordered for the 840 model: Using a special feature, you order 8, 12 or 18 processors and have the possibility – if required – to enable processors for future use that were already present in the system but so far disabled.

For mySAP.com on iSeries, **high-availability solutions** are available from Independent Software Vendors (ISVs). The **BRMS/400 (Backup and Recovery Media Services/400)**, **TSM (Tivoli Storage Manager)** and **IBM CommonStore** for iSeries products support automated tape, backup and archiving functions.

Logical Partitioning (LPAR)



Full e-business functionality is ensured by means of different solutions.

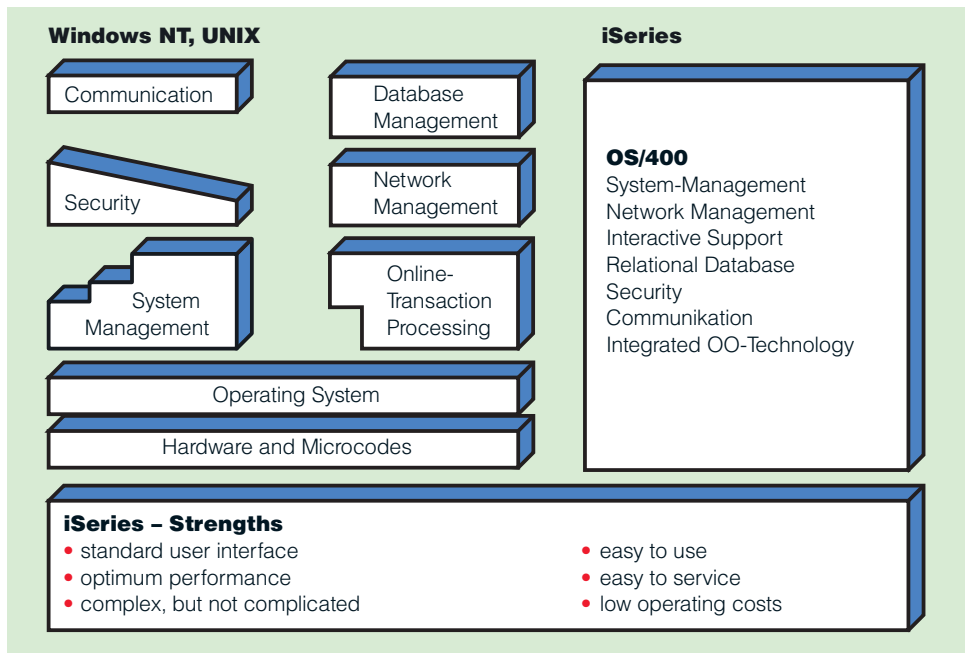
iSeries offers a broad range of communication functions integrated in the OS/400 operating system; all common protocols from SNA to TCP/IP are supported.

The OS/400 operating system – the 64-bit operating system of the AS/400e system – supports the main international standards such as the Single Unix Specification (SUS) and SQL-ANSI. It is therefore ensured that the mySAP.com application code is exactly the same as that used on all other hardware platforms. A significant difference between the iSeries and other mySAP.com platforms lies in the fact that it provides all the important system functions as an integrated component of the operating system environment,

e.g. the DB2/400 database, spooling, communication protocols, data backup, client/server support or system management. This high integration of the iSeries system functions results in a high level of performance, stability and user friendliness being achieved. Because of its integrated architecture of hardware and software, the iSeries can be operated easily and without complication. With its self-controlling functions, it also enables a high level of automation. Many studies have shown that the iSeries holds the leading position in the category of “low total cost of operation.”

mySAP.com is a management client/server application package which runs on the iSeries products in “native mode” and which fully utilizes the DB2 Universal Database integrated for iSeries products. The unique

OS/400 Version 4 – It's so simple!



links that the iSeries products have between operating system and databases simplify the installation and operation of mySAP.com. The installation of mySAP.com here is much less complex and time-consuming than in other system environments.

The benefits of a mySAP.com solution on iSeries at a glance:

- a standard, integrated operating system for all iSeries models
- user-friendly menus and graphical user interfaces for workstations
- detailed “Help” functions
- simple installation and problem-free system expansion by means of automatic configuration support
- single storage concept (main memory storage and disk memory are addressed via a common address space)
- DB2 relational database for OS/400
- simple operation and intelligent system functions
- comprehensive, integrated security concept for all system components
- problem-free communication with remote units, systems and networks
- support for company communication, including interfacing to networks
- integrated remote data processing link for the use of external maintenance functions
- integration of open systems by supporting general and industry standards

- open for advanced technologies such as wireless communication (wireless LAN) and portable terminals
- integrated, tuned client/server technology, cost-saving, effective and simple to manage
- extensive tools for application development for clients and servers

2.3 mySAP.com on IBM @server pSeries

p as in “performance” – as the name already suggests, this is the high-performance and highly scalable **UNIX line** within IBM @server.

The range of performance stretches from the workstation for graphic and multimedia applications to SMP workgroup servers to the Enterprise server models IBM @server pSeries 680 and the flexible **RS/6000 SP** system, which is ideally suited for consolidation purposes. In conjunction with the industry-leading 64-bit UNIX operating system **AIX**, Version 5L, the RS/6000 family forms a mature and secure environment for deployment of the new mySAP.com components. Combined with the IBM **high-availability solution HACMP**, the pSeries and AIX, provide the availability required by a globalized IT landscape for mission-critical applications around the clock.

Furthermore, AIX integrates both key technologies for the Internet and sophisticated, Web-based options for system administration. This means that the development of the operating system fully corresponds to the decentralized requirements of a mySAP.com landscape. The close cooperation with SAP means that the pSeries and the mySAP.com

functionality form the ideal team to accompany you in the growing area of e-business. Whereas a classical SAP R/3 installation, primarily for reasons of scalability and availability, consists of a number of servers, the mySAP.com architecture and the increasingly functional specialization of individual components requires additional dedicated servers. In this context, the pSeries features a very broad range of binary-compatible server. The wide variety of requirements, ranging from an extremely low-cost test system to a fail-safe, highly scalable database cluster, is fully covered by the pSeries.

For test environments or entry configurations, the maximum 4-way SMP systems 7044-270 (desk side) and 7026-H70 (rack) are a very low-cost alternative. These systems already have a 64-bit architecture and a great many availability functions, as is the case with high-end servers. As they have the same architecture and the same AIX operating system, the servers can be easily integrated in larger environments in the event of increased requirements due to more users or new software releases.

The mid range comprises the models 7025-F80 (desk side) and 7026-H80 as 6-way systems and is rounded off by the 8-way model 7026-M80. The M80 already uses technologies (e.g. internal crossbar switch) that are otherwise only standard for high-end servers to implement extremely high memory and I/O band-widths. The high band-widths enable a very good and constant

transaction throughput, even if several hundred users are involved and mySAP.com systems such as Business Warehouse or APO/liveCache. The progressive architecture proves itself not least in the outstanding benchmark results that the IBM UNIX servers achieve in the commercial and Internet sector. For customers with large number of servers, who thus require automated com-



puting center operation, the IBM @server pSeries 640 is an interesting alternative: the 4-way rack model supports AIX and Linux, and can be managed remotely using the new IBM **SNAPP technology** “remote”, e.g. using palmtops.

Following on from the very successful RS/6000 models 7017-S70, S7A and S80, the pSeries 680 model is today the high-end within the server family. Its preferred area of deployment is when powerful mySAP.com database servers are required or when components of mySAP.com need to be mapped on a central system for consolidation purposes.

A maximum of 24 CPUs, clocking at 600 MHz, as well as 96 GB main memory, enable the implementation of very large mySAP.com installations. This system also features the superior architecture of the pSeries: in order to reach the performance values of the pSeries 680, other servers require a much greater number of CPUs and I/O. Here, the pSeries 680 stands out with its excellent price-performance ratio in this market segment. The “Capacity Upgrade on Demand” offer enables the customer to react very spontaneously to rising resource requirements during online operation by enabling CPUs that were installed in the server as reserve from the outset.

Of course, the aforementioned requirement for organizing an mySAP.com system on several/many individual servers places significant demands on the administration and the operating concept for this type of installation. It is here that the RS/6000 SP 9076-550 provides a server consolidation solution which has been implemented thousands of times around the globe.

The conceptual design of the **RS/6000 SP** allows the physical and logical integration required to operate this volume of more or less independent servers practically and with consolidation. In doing so, individual servers (“nodes”) can be installed in multiple racks (“SP frames”) and managed centrally by means of a “control workstation.” With the aid of special software – the **Parallel System Support Program (PSSP)** – the Control

Workstation undertakes the administration of each individual node, i.e. console monitoring, software installation, hardware monitoring, user administration and a great deal more.

Normally, very compact 4-way SMPs as consolidated application servers are used as nodes. These are found frequently in conjunction with the database server IBM

@server zSeries. Naturally, the RS/6000 SP also provides more than adequate capacity for central mySAP.com installations or large database nodes: Internally, a number of 16-way SMP nodes can be used for this, while externally up to 16* pSeries 680 can be fully integrated and administered as “logical” nodes (e.g. as high-end DB server nodes).

As an option, the nodes can communicate with one another via the extremely fast SP switch and externally via conventional LANs. Since links with high speed requirements and low latency times (e.g. communication between database and application servers or, in particular, the C/S data backup) run via the internal switch of the RS/6000 SP, an additional external high-speed LAN is no longer necessary. e.g. with the parallel database DB2 EEE, the RS/6000 SP can be deployed with an internal switch as a highly scalable, massive parallel database server, providing performance for large Business Warehouse environments.

As the operating concept of the SP involving a “single-point-of-control” (control workstation) has been very successful, there is now

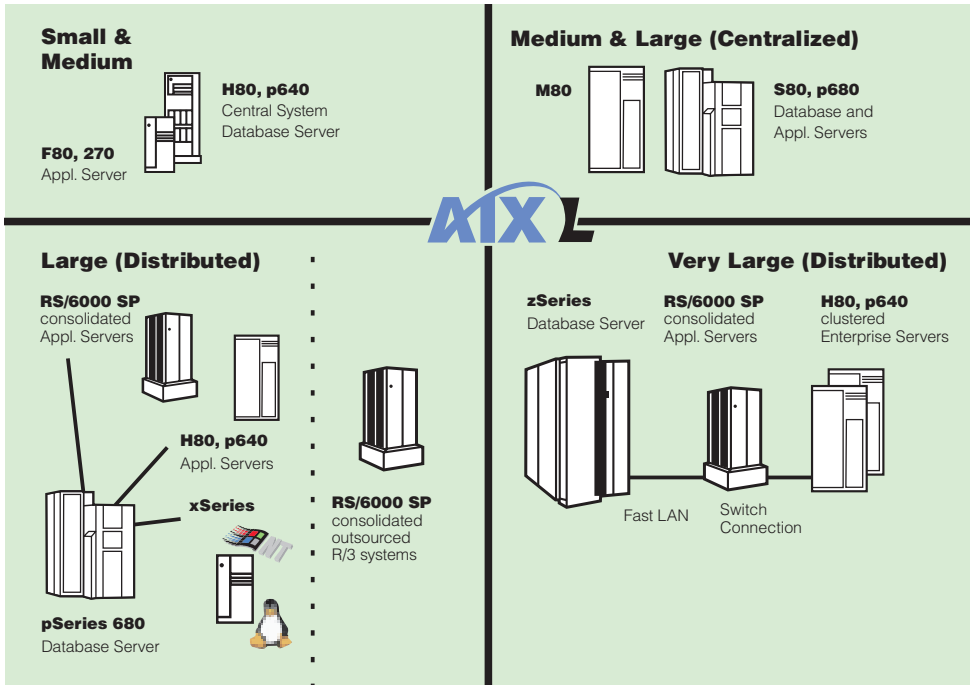
also the possibility to administer discrete servers using a control workstation. As “Clustered Enterprise Servers”, the high-end models (S7x, S8x, pSeries 680) can nowadays be administered jointly using the SP control software PSSP. An expansion of this concept to the mid range rack systems is planned for the near future.

All of the pSeries servers introduced here are designed principally for operation in a business critical environment such as that of mySAP.com. Redundant and **“hot pluggable” components** (network parts, hard disks, PCI adapters) as well as a service processor minimize the hardware downtime. The newer SMP systems also have dynamic CPU deallocation, guaranteeing operation even in the event of failure of a CPU (one of many). The defective processor is only replaced during the next planned service window.

The service processor controls the system hardware and, in the event of a failure, allows remote access to the server for analysis and maintenance purposes. In addition to this, different server components can be automatically monitored through the server with the (free of charge) “Service Director/6000” software – including preventive maintenance by IBM Product Support Services which is initiated via modem when required.

In addition, IBM also offers a **high-availability solution** – “High Availability Cluster Multiprocessing” (**HACMP**) which runs on AIX. This software enables the fully automatic

RS/6000 & SAP Solutions



takeover of servers with critical applications (e.g. mySAP.com database servers, Workplace servers) by backup computers within a short period of time (minutes). In this process, it is possible for one backup system to monitor multiple production systems or even to undertake production tasks. The takeover by HACMP mechanisms remains quasi-transparent for the clients. The combination of the above-mentioned hardware functions with the progressive operating system AIX, which also has components to minimize planned and unplanned offline time, and HACMP makes a pSeries cluster into the preferred platform for every critical e-business application.

Within the family of IBM @server server, the pSeries also supports cross-platform, **heterogeneous mySAP.com implementations**. It has already been stated that the RS/6000 SP is frequently used as an application server for the zSeries in large installations. On the other hand, the pSeries also supports xSeries, i.e. Intel®-based, application servers under Linux and NT as a database server (for DB2 and Oracle).

The strengths of the pSeries become fully apparent when it is used as a platform for the database and other critical mySAP.com components:

- scalability
- 32-bit and 64-bit technology
- proven high-availability solutions
- mature, robust software technology
- flexible disk administration
- ideal system management

On the application side, the xSeries products can utilize the following strengths:

- flexibility
- low absolute investment costs
- short innovation cycles
- use of existing Linux / NT know-how.

In the 10 years since they were developed, the RS/6000 and pSeries servers have attained a very good position in the commercial sector, setting up many benchmark records in the process. This is the result of continued development: since the introduction of the RS/6000, the customer has always been able to expect performance to double within a period of 12 to 18 months. Current product plans are to continue previous developments in the pSeries. The imminent deployment of processors with clock rates greater than 1 Gigahertz and other innovative technologies will ensure that the pSeries remains the preferred platform for mySAP.com.

2.4 mySAP.com on IBM @server zSeries

The IBM S/390 systems and the subsequent server generation, the IBM @server zSeries, are specially conceived for continuous operation of mission-critical e-business applications with high transaction volume. In conjunction with mySAP.com, these servers provide a

system solution for the highest demands in today's e-business world.

Since the introduction of the SAP R/3 database server on DB2 for OS/390 in 1997, hundreds of customers worldwide have chosen this platform for the SAP R/3 system, in which the S/390 database for SAP is supplemented by UNIX or Windows NT-based **SAP application servers**. This solution was expanded in the year 2000 to include the SAP application server on S/390, which can be used alone or in combination with the application servers supported to date. The result is a solution suited to customer requirements which, based on these components, enables operation of all mySAP.com solutions and all SAP industry solutions on the zSeries system environment, and which meets all the demands as regards performance, scalability, efficiency and availability.

The advantages of IBM S/390 and zSeries in a mySAP.com environment in detail:

- **Availability.** In an e-business world, the permanent availability of both the application and the data is an elementary requirement for business success. IBM S/390 shows the best record in this respect: **S/390 Parallel Sysplex configurations** are rated by analysts as extremely reliable solutions. Availability is at 99.999% – i.e. less than 5 minutes unplanned downtime per annum. This benefits both the SAP database and the critical SAP central instance, and thus the entire SAP application.

- **Performance and scalability.** zSeries helps companies to actively take on new challenges and to use new solutions. This is made possible by the outstanding, practically linear scalability of the server family, which enables seamless and practically unrestricted growth – starting with a small single system all the way to a Parallel Sysplex Cluster with up to 16 processors per system. Each of the up to 32 servers in a cluster of this type can access all data sources and can be used both for the SAP database and for the SAP application. Thus, the SAP system can support thousands of users with large transaction and data volumes. Even the high PC performance required, for instance, for new SAP supply chain or Internet solutions can be achieved whilst guaranteeing the highest possible performance and capacity. The huge S/390 range of performance is expanded even further in an upward direction by the zSeries with additional and powerful processors, the support of 64-bit addressing, and other innovations relevant to performance.



- **System administration.** Customers have held OS/390 and DB2 for OS/390 in high regard for many years due to their efficient and well-developed system administration. A high degree of data security, high performance tools for process control and the option of managing different workloads are just a few of the tried and tested functions. In addition, OS/390 and zOS represent an ideal platform for server consolidation: SAP systems for development, test, integration, production, training, etc. can be consolidated on a central S/390 or zSeries server, taking account of security and performance aspects. z/OS, the successor system of OS/390, contains not only the entire OS/390 functionality but also additional, new functions for further improvement of system administration, enabling for example increased flexibility in the event of unexpected workloads.

- **Investment protection.** S/390 users can continue to use the existing S/390 system environment for an implementation of mySAP.com or expand it. Both its hardware and software resources and the system knowledge and established operating processes can be profitably included in the implementation project for the mySAP.com platform. With the seamless transition, project costs, implementation periods and project risks can be kept to a minimum – this applies both to migrations of SAP R/2 to mySAP.com and to new implementations of mySAP.com on zSeries.

- **Cost of Ownership.** Whereas the limited capacity of the underlying platforms has often lead to a decentralization of systems in the past, now there is an increased tendency towards centralization. The scalability of the zSeries systems, especially as parallel sysplex with DB2 data sharing, can be fully utilized for mySAP.com solutions. Customers benefit from a considerable reduction in administration costs due to the consolidation of dedicated SAP system landscapes in a central zSeries system environment. The central and extremely flexible resource management of the zSeries environment keeps the total capacity requirement of such a system landscape low. These savings and special terms for hardware, software and maintenance create the basis for the low general operating costs of the mySAP.com applications on the IBM S/390 or zSeries platform.

- **SAP application server.** The introduction of the SAP application server on S/390 in the year 2000 underlines the high strategic significance that both IBM and SAP attach to the S/390 platform. The SAP database server solution on S/390, which has been successful in the market for many years, is further improved by the SAP application server: availability, performance and integration of the SAP application are increased many times over by using S/390 functionality. As the SAP application server on S/390 and zSeries can be used both on its own and in combination with all certified UNIX or Windows NT application servers, the greatest possible flexibility is ensured for the selection of applica-

tion server platforms in the mySAP.com environment. The specific implementation of individual or multiple platforms means that existing investments and knowledge can be used and new goals set.

In March 2001 IBM and SAP announced plans to deliver mySAP.com on Linux for the IBM @server zSeries with shipment to first customers in the second quarter of 2001. By offering mySAP.com on both Linux and z/OS on the zSeries platform, IBM will provide customers with the opportunity to select the appropriate application server environment with respect to their needs.

mySAP.com on IBM S/390 and zSeries products opens up new options for the development of an individual solution which is adapted to the specific requirements of a company in relation to performance, scalability, efficient and availability. The combination of the strengths of the mySAP.com solutions with the capacity and high performance of S/390 offers maximum support for growing companies in the e-business world – both today and in the future.

2.5 Central storage systems, basis for SAP databases and the mySAP.com landscape

The enormous growth in memory requirements for **databases** has led to changes in the demands placed on storage subsystems: the client/server trend in the past towards decentralizing disk storage and linking it directly to distributed servers is now being

replaced by a completely opposite trend. Customers are striving more and more to centralize disk subsystems and to consolidate data and/or databases.

IBM's response to these requirements is the **Enterprise Storage Server (ESS)** system. ESS provided the basis for data management, **high availability** and storage sharing in **heterogeneous environments** (UNIX, NT, OS/390, OS/400) and/or (pSeries, xSeries, zSeries, iSeries). In conjunction with data consolidation for a number of SAP database servers for production, test, development etc. **ESS** was designed for users who require a fast, flexible and high performance disk storage pool. It features a wide range of innovative functions.

ESS is a product in the **SEASCAPE** family and architecture. The SEASCAPE architecture enables use of proven components, for example RS/6000 processors, **SSA disks** (Serial Storage Architecture) as the disk technology, FC switches, etc. This makes it easier to continuously adapt to the growing demands of customers. Users of applications these days make increasingly high demands on application availability. IT service providers and service users are more and more frequently concluding SLAs, Service Level Agreements, as the mutual basis of business.

The user requirements for high availability of the SAP applications can be met using ESS subsystems, as all the components are redundant at least once. Availability can be increased

using ESS functions such as “Flashcopy” for creation of a logical copy of the database in a few seconds. This copy can then be stored in the background “offline” without time pressure on a tape subsystem. Moreover, if at least two ESS disk subsystems linked with PPRC (Peer to Peer Remote Copy) and at different locations are used, duplicates of the databases for production can be run. In the event of a disaster (failure of one location), this means that a fast restart – within minutes – can be performed.

An essential step towards “server-less back-up” is the incorporation of the ESS disk subsystem in the SAN environment (Storage Area Network). Today, all the described components, functions and processes are important for deployment in, for example, the area of e-business. For e-business, “shops” must always be open, 24 hours a day, 7 days a week.

The IBM Enterprise Storage Server – the ideal and reliable storage subsystem with outstanding properties; selected data and functions of the IBM ESS system, model F20, indicate the range of applications:

- Central storage pool, scalable in steps with a net storage capacity of up to 11.4 TB
- Ideal for heterogeneous computer environments at our customers: simultaneous connection of UNIX, NT, AS/400 and S/390 systems
- Storage space can be distributed as required between linked computers and can be adapted online to new requirements

3 IBM Networking

- Data sharing is possible between homogeneous systems
- Internal IBM hard disks (in the SAP environment mainly with 18.2 GB and 36.4 GB capacity per disk)
- High-availability RAID-5, estimated data storage with the following performance figures:

Workload:	max. throughput
Cached open system	41000 IO/sec
Cached S/390	32 000 IO/sec
Sequential read -S/390	300 MB/sec
Sequential read -open	350 MB/sec
Sequential write -S/390	200 MB/sec

- Additional protection and availability through integrated copy functions
- Fast SSA technology with high level of internal data throughput
- Optimization of load distribution of the I/O paths
- Full hardware redundancy and battery buffer for controlled shutdown
- SAN and e-business ready
- Remote Call-Home support which can automatically inform the IBM service center in the event of a fault
- High-performance storage administration and analysis with the software available for ESS
- Web-based, easy-to-use interface for ESS configuration and management
- ESS is a product from the Seascape family, i.e. integration of the latest technology is always possible

3.1 IBM Networking and Connectivity Services – high availability for SAP network infrastructure

The victories enjoyed by Internet, Intranet and Extranet present today's network managers with the task of implementing a new and flexible network architecture, thus creating the foundation for a new mode of transacting business – a mode known as e-business. The implementation of ERP applications and/or the mySAP.com e-business platform often starts this off. **IBM Global Services** is meeting the challenges of today's information and communication market with a comprehensive solutions-based strategy. Thanks to our partnerships with the leading manufacturers of network hardware such as **Cisco Systems, Nortel Networks, Lucent Technologies**. etc., we can offer our customers the best possible solution to suit their business process requirements. The use of high-speed technology in the set up of your intranet is therefore just as unproblematic for you as the migration of your **SNA architecture** to IP. With the support of our partners, we are always able to provide the best product strategy for scaling your intranet architecture and with our network service you also receive optimum support for your SAP environment.

Our expertise in setting up virtual LANs and in installing and operating VPN technology (**Virtual Private Network**) means that we can

provide you with the required basis for reasonably priced and secure networking with no locational restrictions. In order to avoid possible failure of your network and the resulting restrictions to the availability of your SAP system, we offer comprehensive concepts in the field of networking and high-availability services. That way we ensure that you get the best possible quality from your SAP system. Our **network consulting services** can also provide you with the consulting service that you require for designing your communication structure.

3.2 Firewall implementations

In Internet terminology, firewalls are links (gateways) between two networks – generally between the Internet and an internal corporation network. They control the data traffic between the two networks and allow only those items to pass which have been expressly authorized in advance. To ensure that a secure corporation network remains so, we recommend the installation of the **IBM eNetwork Firewall** for Windows NT or AIX. Their foundations are built on experience gained since 1987 in security of the IBM Intranet and on the **IBM NetSP Secured Network Gateway**, which has been available since 1994. The available tools required for this are:

- IP filters
- proxy servers
- sock servers
- domain name services
- secure mail
- authentication methods
- logging options
- remote administration

3.3 IBM Communications Server

mySAP.com is an online application which uses TCP/IP as the communication protocol between servers and clients. Many companies use **SNA** and **APPN** as their strategic backbone network and have a large network based on SNA hardware and software.

In general, SNA does not support TCP/IP-based applications. If these companies wish to use mySAP.com on the existing infrastructure – without setting up a separate network – then AnyNet Multiprotocol Technology can be used.

The “**AnyNet Sockets over SNA Gateway**” function provides the option of transporting any socket application via SNA or APPN backbone networks.

AnyNet is included in the communication server, as well as for OS/2, Windows NT, Windows 2000, AIX and OS/390. AnyNet is a solution which has been certified by SAP. Tests have been carried out for OS/2, AIX, DOS/Windows, Windows 95 and Windows NT clients. In addition, this solution offers the benefit of a link-oriented protocol that includes priority and overload checks.

Other benefits:

- Asset protection for the existing hardware infrastructure and the skills pertaining thereto

4 IBM User Systems for mySAP.com

- Predictable SAPGUI response times
- Improved response time behavior with overloaded networks
- No impairment of SAPGUI response time behavior during large print jobs
- Given the same bandwidth, a higher number of SAP users can be interlinked with AnyNet than with a TCP/IP router network

Using the communication server, both the pSeries and an IBM PC server can be represented as an SNA unit within an SNA network (LAN or WAN), thus ensuring secure and rapid communication with the IBM mainframe. In this manner, for example, communication can be established between an SAP R/3 satellite system with the SAP R/2 system on the mainframe. Furthermore, the **IBM Personal Communications** product enables file transfers (multiple sessions) and 3270 emulations to be operated, and these may then be used on all of the linked workstations, together with the actual applications (e.g. mySAP.com). A server-based, fast “Web-to-Host” terminal emulation solution for the intranet or extranet can be set up using IBM **WebSphere Host On-Demand** without any additional programming. Host On-Demand is based on Java technology and can therefore run on any platform which has a Java Virtual Machine (JVM). On the iSeries 400 models, these functions have already been integrated as server platforms in the OS/400 operating system. You can achieve more comprehensive and convenient interfacing capabilities with extended functions with MQSeries®.

4.1 IBM NetVista, stationary user operation

The **IBM NetVista** family offers PCs which are best suited as mySAP.com front-ends for businesses as you can use them to focus on your transactions. The engineering design objectives were high performance, management capability and asset protection. With its broad range of NetVista models, IBM can fulfill all of your hardware requirements, and can thus contribute to the growth of your company.

The latest development in a long line of standard-based IBM solutions/Intel Advanced Manageability Alliance is called **Universal Manageability Services**: It enables the direct integration of client data from IBM NetVista PCs into management applications such as Tivoli NetView, Microsoft SMS, Intel LAN-Desk Management Suite and IBM Netfinity Director.

With its NetVista A20 model series, IBM offers affordable PCs for essential business requirements – performance and manageability at an extremely affordable price.

With the NetVista A40 and A40p models, you get high-performance solutions to handle more in-depth business requirements – cutting-edge technology for maximum performance, manageability and system security

with maximum platform stability and asset protection.

The NetVista A60 is synonymous with absolute high-end performance in the area of personal computing.

With the installation of an IBM network card with **WoL (Wake on LAN capability)**, you can execute the remote powerup and operator-free powerup of IBM PCs via **networks** for administration and updates.

SMART Reaction 2 software automatically backs up data on the server, but also in a hidden location on the client hard disk, if an imminent disk error is identified. This enables users to continue to work and the data to be backed up until the hard disk has been replaced.

Asset ID – NetVista A40p are equipped with radio technology which facilitates installation and operation, materials management and monitoring. The EEPROM stores key system data which may be called up via a portable radio unit and the corporate security systems.

Alert on LAN (AoL 2) uses a combination of hardware and software and provides immediate notification (via Netfinity or LAN Desk) if the system is used without authorization or has been removed from the network, or if the power supply has been cut – even if the PC is switched off.

AoL 2 also allows the client system to be re-booted and **error diagnosis** to be carried out by the administrator if the client crashes during system testing. In addition, the administrator is also notified if the housing has been opened, if there have been fluctuations in the temperature or voltage or if the processor has been removed.

The built-in **security chip** enables codes to be stored directly in the hardware chip instead of on less secure hard disk solutions. Current security standards and concepts (SSL, PKI – Public Key Infrastructure, etc.) are supported.

4.2 IBM ThinkPad – the next generation in mobile computing

With the IBM ThinkPad **notebook** family, you enjoy the new freedom of mobile computing – and experience the fascination of the unique ThinkPad technology. After all, the new IBM notebooks are not only convenient,



lightweight, attractive and still robust – they are also simpler to operate and easier to manage than ever before. Whether you are looking for outstanding performance, an ultra-light or multi-purpose Notebook for the office or for home use: IBM has the right mobile mySAP.com **front-end** solution for you.

If it is quality and reliability you are looking for, you will find in IBM a partner who will protect your investments as no other manufacturer can, whilst providing the greatest value for your money – with a versatile, modular design for handling a large number of options, the extensive product line of options by IBM and tried and tested ThinkPad docking solutions.

IBM offers a warranty of up to three years with international warranty service, 30 days no-cost telephone support for the ThinkPad and the pre-installed operating system, and extensive ThinkPad on-screen help with specific Questions & Answers, drivers, upgrades, product information and tips.

With IBM SystemXtra you can make the very best of your ThinkPad investment. Profit from a complete package of technologies, services, software and training products, and convenient financing options.

Find out more about the comprehensive mobile computing solution that IBM offers for your business – outstanding chip technology, unparalleled quality and excellent post sales

service and support, sound asset protection and unparalleled system management functions – You'll understand why we think that you won't find a better mobile computer for your business.

4.3 IBM NetVista Thin Client

The **IBM NetVista Thin Client** (N2200, N2800) is IBM's network computer for corporation networks. The IBM NetVista Thin Clients have a modern, user-friendly graphical user interface. Applications on the IBM iSeries, pSeries and zSeries, as well as intranet/Internet applications, Java applications, and applications on the Microsoft Windows NT platform using **Citrix Metaframe ICA**, can be executed with the NetVista Thin Client. **Win32** (like the traditional **SAPGUI**), **Motif** and the **JAVAGUI of the SAP** can also be used by you. Cutting edge TCP/IP infrastructures and the latest software platforms can be used on the IBM NetVista Thin Client series. At the same time, you still get the simple operation and **low costs** that you get with non-programmable terminals – for significantly less than the price of a standard PC. For example, SAP AG itself uses more than 1000 IBM Thin Clients in its in-house training centers in Walldorf, Switzerland, Austria and the Netherlands.



The IBM NetVista N series operates on the thin/client concept, whereby all software components (emulation, browser, JVM, ICA Client) are loaded as required from a server or a **FLASH card** to a network computer. With the IBM NetVista Thin Clients, the download is initiated by a power up or by appropriate application functions. As the software is stored on a server, it can be managed and updated centrally. This eliminates the need for a separate installation and the maintenance of software versions and configuration data on dozens, hundreds or even thousands of Desktop PCs. Furthermore, users of IBM NetVista Thin Clients do not need to worry about local data backups as in the Thin Client concept these are carried out and kept by central servers. With its NetVista Thin Client Manager software or the NetVista Thin Client TurboLinux software, IBM provides effective tools for the management of clients, which can also be integrated using SNMP in company-wide systems management systems such as Tivoli.

IBM NetVista Thin Client combines the benefits of non-programmable terminals with those of personal computers in one system:

- low maintenance and software management costs due to central installation and maintenance of the application software and central storage of the data
- simultaneous use of non-graphical applications and applications with graphical user interfaces (GUI) at a workstation

- cost-effective alternatives to personal computers which are operated primarily for application emulation
- as alternatives to having to equip PCs or replace non-programmable terminals with personal computers if they no longer meet the demands of the application or their maintenance is no longer efficient
- use of central network Java applications, components and functions at the workstation only when the user actually needs them
- independence from the platform of the application server
- independence from the fat client (PC) configuration. Mobile users in the company have their own personal access wherever NetVista Thin Clients are installed.

Other benefits:

- fast boot process
- low noise level
- low thermal output
- security against user manipulation

Given all these functions, the NetVista Thin Client series represents the ideal platform for the **migration** of host via client/server applications to true e-business applications with low administrative costs, as is required e.g. with mySAP.com.

5 IBM Software Solutions and Service Offers for SAP Environments

5.1 Information management on the basis of your SAP data

5.1.1 IBM DB2 Universal Database and mySAP.com – the ideal combination

The main criteria for selecting the right database platform from an SAP installation is not merely functional or technical. Factors which influence management decisions are much more important when deciding which database should be used as the basis for an mySAP.com e-business solution:

- availability of database expertise
- complexity of database administration
- licensing and maintenance costs
- operating costs
- support from the database manufacturer
- performance/scalability/availability
- confidence in the database product and its continuing development

The **IBM DB2** relational database is certified and available for the mySAP.com e-business solution family as the database platform for the following operating systems: IBM AIX, IBM OS/400, IBM OS/390, IBM z/O as well as HP-UX, Linux, SUN Solaris, Microsoft Windows NT and Windows 2000. From Enterprise Servers to the laptop, with DB2 IBM offers an extremely robust database system for operating mySAP.com e-business solutions. It is particularly important that in the

mySAP.com solution architecture there is only one database server per product. This server contains all corporate data and system tables and must be accessible at all times. To ensure the availability of the mySAP.com solution system, both planned and unplanned downtimes of the database server must be reduced to a minimum, as otherwise the mySAP.com e-business solution system will also no longer be available.

DB2 is the ideal database platform for mySAP.com e-business solutions, with its unique scalability across all performance levels, distinguished by the following features:

- a robust database management system
- a very good price/performance ratio
- only available parallel database for SAP Business Information Warehouse
- Integrated Tivoli Storage Manager (TSM) interface
- First database with cost-based optimizer for SAP
- largely nonstop operation (7 days/24 hrs) worldwide DB2 support for mySAP.com, 24 hours a day – with SAP OSS.

Specifically designed for the rapidly growing Microsoft Windows NT market, IBM DB2 Universal Database was the first database to be presented with an award by Microsoft: “Designed for Microsoft BackOffice”. As, above all in the workstation area the ease of administration is of significant importance, particular value has been placed on an intuitive, web-based user interface with integrat-

ed user guidance – Smart Guides. These are step-by-step commands given via dialog boxes on all the important administrative tasks. The special requirements of the mySAP.com solutions are taken into account in the following extensions of the DB2 Control Center functions:

- Tape and log file administration
- SAP R/3 password administration on operating system level
- Central point of control for all mySAP.com e-business solutions
- Multiuser and multiplatform administration for mySAP.com e-business solutions.

With the SAP Starter Packs, preinstalled and preconfigured solution environments are available under IBM DB2 which have been specially designed for medium-sized companies. This enables a significantly faster installation which, together with the simple administration under DB2 (Control Center and the SAP DB6COCKPIT), also makes problem-free operation easier.

If there are specific demands for system availability, it is possible to capitalize on high-availability solutions from the respective operating system environments.

IBM DB2 demonstrates its strengths particularly as a database platform for the **SAP Business Information Warehouse**. Using the IBM DB2 Enterprise Extended Edition the database can be partitioned, enabling it to be distributed across several servers. The database remains as a logical database for the end

users and the administrators, even if it is physically distributed. This enables the database to grow beyond the performance limit of currently available SMP machines. Due to this and other technological advantages, SAP has migrated the development for SAP BW to IBM DB2 Universal Database (as of SAP BW 3.0).

5.1.2 SAP Business Information Warehouse on IBM DB2 Universal Database

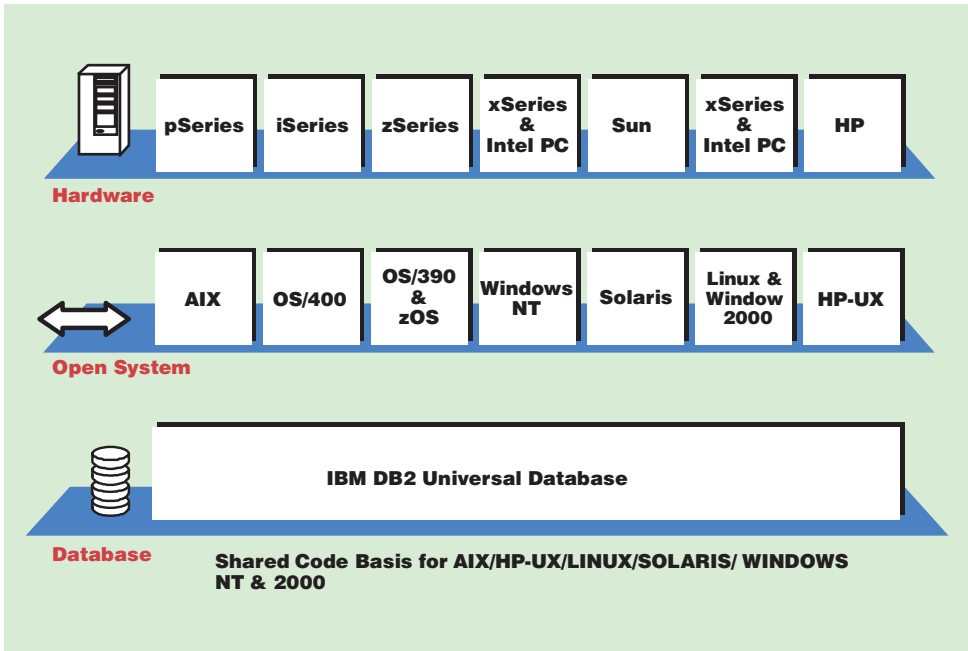
SAP Business Information Warehouse

The need to react quickly to changes in markets, to gain a consolidated view of the company, and to introduce customer-centered processes, makes it necessary to analyze existing data quickly and flexibly in Business Intelligence solutions. This is used as the basis for informed decisions, both for day-to-day business and for new strategic alignments. Business Intelligence helps companies to better understand customer behavior and to derive marketing campaigns suited to the target group or to align the product portfolio accordingly. **Business Intelligence** enables up-to-date and flexible monitoring of sales figures or the evaluation and consolidation of vendors.

SAP Business Information Warehouse with IBM DB2 Universal Database and IBM Intelligent Miner

Particularly well received by the critics was the combination of SAP Business Information Warehouse with the DB2 UDB database as regards performance, scaling and costs. SAP

mySAP.com with IBM DB2 – Platform availability



BW is available on all four IBM platforms under DB2 UDB and fully utilizes the special high-performance Business Intelligence functions in DB2 UDB.

The solution offered here by IBM is unique: extending the SAP Business Intelligence solution Business Information Warehouse to include data mining functions to find unidentified patterns in existing data, important for example in customer segmentation. IBM and SAP's **data mining** is based on a connection from SAP BW to the IBM product that has received many awards, **Intelligent Miner for Data**.

Implementation of SAP Business Information Warehouse with IBM Global Services

IBM Global Services is there to help you carry out an SAP BW project. IBM Global Services has many years of experience in the implementation of SAP R/3 and **data warehousing** projects and provides industry-specific support across the whole service chain, from strategic business consulting to outsourcing. At the beginning of an SAP BW project, it has proven useful to hold a strategy workshop, which helps to ensure that investment is made in the applications and solution platforms with the highest potential for

success, that specialist and IT departments are supporting the solution, and that the know-how required for the implementation is passed on. Complex topics are dealt with in workshops, such as:

- Which business questions should be answered by a Business Intelligence System?
- How should these business challenges be prioritized?
- What type of analysis applications should the desired solution support?
- What data is required for this?
- How should a limited budget be invested?
- What subsequent project stages should be planned for?

A data warehouse is introduced on a step-by-step basis and based on a business intelligence strategy, beginning with a pilot phase for a dedicated division with defined data sources and analysis applications. The aim of the pilot phase is to quickly create a short-term operational solution which represents a benefit in itself and which also provides the professional and technical basis for the inclusion of further divisions and data sources.

5.1.3 Data Mining

The IBM DB2 Intelligent Miner for Data, the IBM **data mining** tool, enables large amounts of interesting information to be discovered. Such findings may contribute towards being able to better predict customer behavior or define new areas of business or market trends.

Via a link to the SAP Business Information Warehouse data mining analyses can also be carried out on data in the SAP BW. Data from **InfoCubes** and the results of SAP reports can be provided to the Intelligent Miner. It is also possible to transfer Intelligent Miner output tables back into the SAP BW. This solution is now available, based on the SAP BW Release 2.0b and Version 6.1 of the IBM DB2 Intelligent Miner for Data.

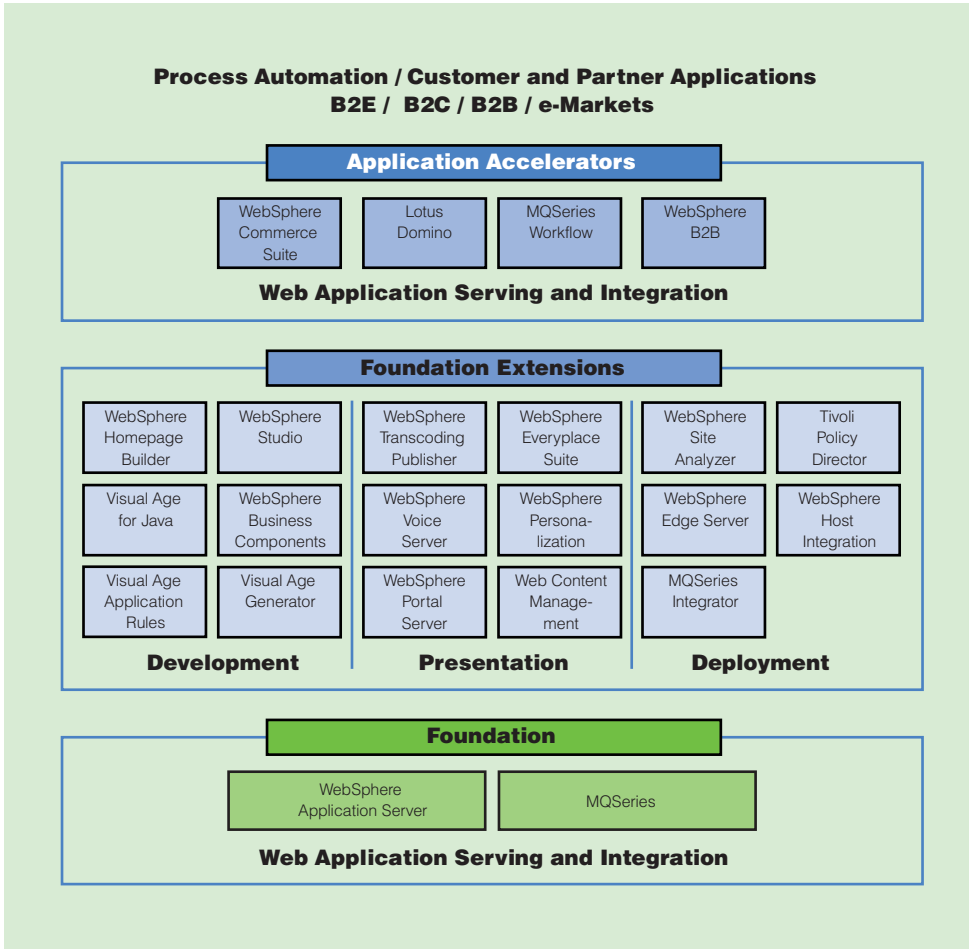
5.2 Integration in other systems within your IT Infrastructure

5.2.1 The IBM WebSphere software platform for e-business

The new global, fast-paced Internet economy demands integrated, flexible solutions that work seamlessly with existing business processes. **IBM's WebSphere** can integrate with and extend SAP and mySAP.com solutions and support business level integration in the key business areas of business-to-consumer, business-to-business and collaborative e-commerce.

The IBM WebSphere software platform for e-business is a robust, secure and scalable platform. It is based on industry standards – such as Java, XML and J2EE technologies – making it flexible and pluggable. The platform supports the major operating systems and allows integration of e-business applications with data and other applications on 35 different platforms. It can integrate with and extend SAP and mySAP.com solutions in the following areas:

WebSphere software platform for e-business



- Message and transaction-based integration on the infrastructure level
- Development of new integrated Web applications
- Extension of web-based mySAP.com solutions to reach users through voice, pervasive devices or portals
- Scalability of these solutions for high-volume Web sites.

In the development of various mySAP.com Marketplace components, SAPMarkets leveraged the speed of developing with VisualAge for Java and the flexibility of using a J2EE technology-based infrastructure with WebSphere Application Servers.

The WebSphere Application Servers offer a deployment environment for e-business ap-

plications. The Standard Edition allows the use of Java servlets, JavaServer Pages and XML together with databases. The Advanced Edition adds application partitioning and load-balancing capabilities and a high-performance EJB server for implementing EJB components that incorporate business logic. The Enterprise Edition integrates EJB and CORBA components and comes with a wide range of connectors to build high-transaction, high-volume, e-business applications well integrated with core systems.

SAP integration with external applications

Today's applications are characterized by components that can be reused and are easy to maintain. They are modular, can be flexibly combined and configured, and thus provide the highest degree of productivity and efficiency. In view of these facts, the SAP R/3 system is functionally split into so-called business objects as part of the “**Business Framework**”.

With its Business Framework, SAP has also defined an architecture with which external systems are to be connected to and integrated with SAP R/3. The Business Framework defines three levels on which the integration can be carried out. The infrastructure which is used for communication with SAP R/3 is defined at the lowest level. This is where IBM products such as communication servers and **AnyNet** should be located to connect to various network infrastructures.

The Business APIs define the interface to the SAP applications on the next level. In contrast to the Remote Function Calls (RFC) modules, these **BAPIs** form a reliable interface so that external applications have a high degree of security that they will remain compatible with an SAP R/3 release upgrade. There are BAPIs which can be called up synchronously as well as BAPIs which exchange data by means of **iDOCs**, as they are called. Certified ALE and Workflow scenarios on the logically highest level define the semantic links between SAP R/3 systems and external systems.

Access Builder and Connector for SAP R/3

With VisualAge for Java Enterprise Edition which contains the Access Builder and Connector for SAP R/3 in the delivery scope IBM offers a powerful tools for connecting external applications to SAP R/3 synchronously or asynchronously using BAPIs or **Remote Function Calls (RFC)**.

A company can create its own Java applications, Java applets, Java servlets or Enterprise Java Beans with the Java development environment of VisualAge in an easy, productive and reusable way. When accessing the SAP Business Objects, they are shown by the Access Builder as 100% Java Beans. The SAP R/3 functionality can be used directly in your intranet or via the Internet: existing SAP applications can also be easily integrated!

Its runtime library includes a robust and scalable implementation of the Common RFC Interface for Java, that was jointly developed by SAP and IBM. It comprises a connection manager for connection pooling, an RFC server to invoke Java methods from within SAP systems, and a **Common Connector Framework (CCF)** Connector implementation for SAP systems. The CCF offers a common client programming model reusing the programming skills and enabling higher level tools for the integration of different core systems. CCF is a predecessor of Sun's J2EE Connector Architecture (J2EE CA), which was defined with the CCF design principles in mind. Using CCF today is the best thing to do to prepare for using **J2EE Connectors** when they become available. Implementing the CCF connector interfaces makes the Connector for SAP R/3 consistent with other e-business connectors (IMS, CICS, MQSeries etc.).

The picture on the previous page shows an extended Web application scenario: Using the CCF Connector for SAP R/3 also allows support for Java and CORBA client applications. In addition, the Web application now can benefit from the Web application server's infrastructure services such as security, naming and transactions.

Enterprise Java Beans (EJB) generated from SAP Business Objects enable a scalable transaction-based solution for three-tier client/server applications. Due to the widely available support for the EJB standard, even

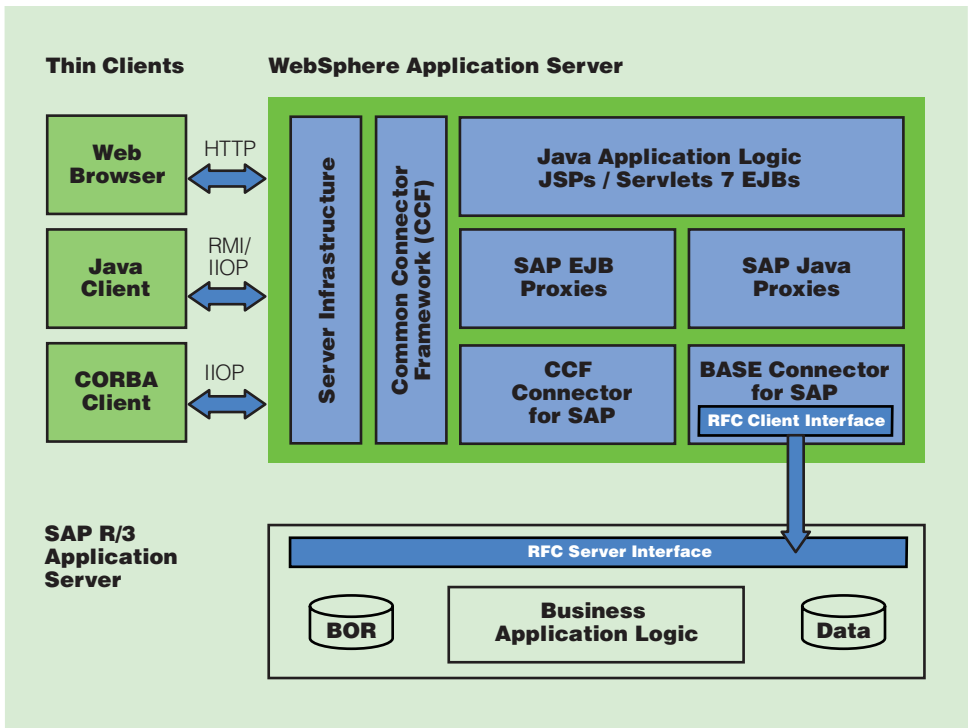
on IBM infrastructures such as CICS, IMS, DB2, the EJB standard is an important milestone for a simple, server-oriented integration of SAP R/3 functions into new object-oriented applications.

Grow and adapt to changing market needs

The WebSphere Foundation Extensions help organizations to keep pace with rapid development as their e-business grows. Through WebSphere's software modules and tools, businesses can develop new applications, enhance the ways users can access and experience their e-business as well as manage the steadily growing traffic and increasing complexity.

WebSphere Studio enables Web site managers, page designers and developers to build and manage personalized Web sites and dynamic Web pages cooperatively. Developers with traditional, client/server and object-oriented skills can collaborate on building end-to-end WebSphere solutions using familiar tools. For Java developers, VisualAge for Java, Enterprise Edition tremendously speeds up the development of Web applications, with its integrated and remote test environment for WebSphere and a whole suite of tools for integrating core systems such as SAP R/3.

The Access Builder for SAP R/3 lets you easily browse through business objects and RFC modules and generate HTML documentation, Java Beans and EJB proxies. The Connector for SAP R/3 runtime library, which is



included, also facilitates access to meta information about business objects, BAPIs, RFC modules, tables and structures, making it a good base for developing tools.

The WebSphere Foundation Extensions helps to manage and extend Web sites. You can deliver personalized content with WebSphere Personalization Server, embrace wireless and pervasive devices with WebSphere Transcoding Publisher or the all-in-one WebSphere Everyplace Suite, reach users by voice with WebSphere Voice Server and build complete portals with the WebSphere Portal Server. WebSphere Edge Server provides load-balancing, caching and filtering capabilities to handle enormous

volumes of traffic, such as on the official Sydney 2000 Olympic Games Web site.

With WebSphere Site Analyzer, you get operational and business analysis of your Web site and visitor usage. Based on Web, Java and XML standards, these products can also enrich and extend Web applications based on solutions such as SAP Internet Transaction Server or mySAP.com Application Server.

Enterprising e-business solutions

WebSphere Application Accelerators are modular, extensible business services. They are aimed at enabling enterprises to tailor their solutions to their needs in the areas of B2C,

B2B commerce, and e-collaboration. WebSphere Commerce Suite supports the creation of B2C, B2B commerce sites, e-marketplaces and shopping malls. As an add-on product, IBM Commerce Integrator links SAP, other ERP and business application systems to WebSphere Commerce Suite with rules-based message routing, transformation and formatting.

WebSphere Business-to-Business Integrator provides for the easy integration of multiple partners across multiple time zones, with multiple IT infrastructures, communication channels and security protocols into one business-process-oriented B2B solution using a variety of industry standard open data exchange protocols, such as RosettaNet, OBI and Cxml.

The back-end integration is based on the MQSeries family. **Lotus Domino** adds collaborative capabilities to initiate and strengthen relationships with employees, customers and partners. There are various ways of integrating Lotus Domino with mySAP.com solutions, including Lotus Enterprise Integrator for triggered high-volume data exchange, Domino Connector for SAP R/3 for synchronous integration or using Lotus Domino as Web server with SAP Internet Transaction Server.

WebSphere Commerce Suite – SAP R/3 Integration

WebSphere Commerce Suite is a software package with which companies can set up online shops on the World Wide Web (WWW). It enables the display of products and services,

secure payments using credit cards, and works together with other managerial applications such as SAP R/3. The WebSphere-R/3 Integration connects a retailer's online shop to the business processes of its SAP R/3 system. It combines the strengths of both systems to form a new solution. WebSphere ensures the security of critical SAP R/3 business data.

The Internet buyer has the following options of accessing the SAP R/3 system using WebSphere:

- Using the WebSphere tools and the customer data on the SAP R/3 system, you can create individual customer catalogs, prices, discounts and order forms.
- Information on the availability of a product can be acquired directly from the SAP R/3 system by WebSphere before an order is placed.
- Unit prices, taxes, discounts and delivery information are imported directly from the SAP R/3 system and displayed on WebSphere during an order transaction.
- The order placed by the customer is sent directly to the SAP R/3 system by WebSphere. The order is registered by SAP R/3 and initiates the internal SAP R/3 processes for price calculation, delivery and invoicing.

WebSphere-R/3 Integration is based on the Net.Commerce API and uses the BAPI technology of SAP to access SAP R/3. It is available for AIX, SUN Solaris and Windows NT platforms and is included in the WebSphere PRO package. It includes demo files, sample code, program libraries, and documentation.

SET is an open industry standard which enables the use of credit cards over the Internet. The protocol was introduced by Visa and MasterCard with financial support from allied businesses with the objective of establishing a technical standard. It is intended to guarantee the secure use of credit cards through open networks such as the Internet. The comprehensive SET specification is based on a cutting-edge encryption technology which contains a digital signature and confirms the identity of all parties involved in the electronic transaction (customer, retailer, clearing office, certifying body).

The **IBM Payment Suite** is the first complete solution for making a rapid, simple and secure purchase on the Internet using a credit card. It provides state-of-the-art features for more security. The identification of the parties involved in the sales transaction makes the online purchase convenient and secure for customer and retailer.

IBM Payment Suite integrates the SET standard in the individual phases of an e-commerce transaction and uses digital certification for trustworthy business relations between customer, retailer and the bank involved.

IBM Payment Server is the electronic counterpart of the retailer's cash register. It accepts an electronic payment, e. g. with SET-based credit cards, and transmits the necessary information via the Internet to the financial institutions in order to obtain its

authorization. The Payment server stores information on the purchase as well as the administration of payments with the financial institutions.

The Payment server supports payment protocols by means of "payment cassettes" or plug-ins and enables the use of different modes of payment. Although it was originally supplied with the SET V1.0 protocol, IBM plans to support other payment methods in the future such as Internet-based digital checks, money cards and other forms of electronic money. The Payment server is capable of working together with solutions from different providers.

5.2.2 The MQSeries product family

The **IBM MQSeries** family is designed to integrate customer business systems. That means that ERP systems such as mySAP.com can work with existing applications. The MQSeries family accomplishes this with an open, scalable, market-leading messaging and information infrastructure that can pull together applications throughout the enterprise to completely integrate business processes.

With availability on more than 35 platforms, MQSeries can connect almost any application to any other. MQSeries is field proven and used worldwide in high-volume, mission critical ERP applications to achieve business integration without time-consuming and expensive reprogramming. MQSeries, IBM's industry-leading, messag-

ing-oriented middleware, enables diverse applications to communicate securely and reliably over a wide range of platforms. MQSeries leads the market with over 5000 customer sites and has broad partner support.

ALE (Application Link Enabling) and MQSeries Link for R/3

ALE is part of the integration technology in the SAP Internet Business Framework. ALE provides real-time asynchronous communication over RFC (Remote Function Call) or tRFC (Transactional RFC). ALE links distributed, autonomous SAP applications with one another, as well as with other mission-critical applications.

As it becomes an integral part of the business process itself, the flow of information between distributed applications has to meet the same requirements as any other single system as regards integrity, reliability, and availability. IBM, having years of experience in enterprise computing, offers **MQSeries Link for R/3**, the first **SAP certified solution** for mission critical business information exchange with ALE.

The MQSeries Link for R/3 runs on each of the five popular mySAP.com application server platforms:

- IBM AIX.
- IBM OS/400
- Microsoft Windows 2000
- HP-UX
- Sun Solaris.

As well as making the integration of distributed mySAP systems with non-SAP applications much simpler, it provides flexibility, independence in the business components, and speed of innovation.

mySAP.com – one-step business with MQSeries Integrator

True one-step business solutions need to be capable of covering the full procurement cycle and enable full integration with the back-end systems of buyers and sellers. Effective application integration of mySAP.com and non-SAP systems is vital to respond to these requirements and enable organizations to respond to changing market conditions, seize new market opportunities, improve customer service, and achieve business growth potential. MQSeries Integrator is a proven solution that delivers clear, feasible benefits to complex mySAP.com one-step business integration projects because of its ability to act as a powerful information hub joining multiple functionally-rich system in a logical easy-to-grasp design.

MQSeries Integrator greatly simplifies the connections between different applications. Exploiting MQSeries' messaging and queuing capabilities, MQSeries Integrator dynamically and intelligently transforms and routes the messages between mySAP.com and non-SAP applications. In addition, MQSeries Integrator provides flexibility for business change. You can extract much of the business logic from your applications, and implement it as rules within the MQSeries Integrator hub. That way you can manage application change

between all applications and minimize the effect on applications if overriding business rules need to be modified.

MQSeries Adapter Offering – all the adapters you need

MQSeries Adapter Offering (MQAO) is an integration methodology and a set of integration tools optionally based on the specifications defined by the Open Applications Group, Inc.

The methodology and tools have been developed by IBM through involvement in the Open Applications Group, by involving packaged application vendors such as SAP and customers in their development, to provide a number of adapter blueprints to support their application environments. MQSeries Adapter Offering provides the ability to convert from a “standard format,” an Open Applications Group (OAG) Business Object Document (BOD) to an SAP IDoc (Intermediate Document) or to any SAP interface of the Internet Business Framework and vice versa. IBM MQSeries adapters, together with MQSeries messaging, make it easier and quicker to manage the integration of your mySAP.com and non-SAP business processes and reduce the risk, complexity and cost of managing point-to-point application integration. They provide a safe and predictable migration path, starting with a few connections.

The powerful kit that is part of the MQSeries Adapter Offering provides you with all the adapters you need. As adapters are built just

once, this method is much easier and more economical than having to recode data communications every time there's a change. With MQSeries adapters, you really can have all the adapters you'll ever need.

MQSeries Workflow

MQSeries Workflow is a flexible workflow management software package which aligns and integrates an organization's resources, accelerates process flow, cuts costs, eliminates errors and improves workgroup productivity. With the ability to capture and use knowledge about the business processes, MQSeries Workflow helps organizations define, document, test, control, execute, improve, and integrate their business processes. The ease of change enables the organization to react quickly to new market requirements, and it acts as a business process manager that handles business tasks that may span minutes, hours or many days.

The main features of the product include the graphic modeling tools, scalability throughput for critical business processes, high reliability, broad availability on workstation and host platforms, and access to workflow functions via clients and APIs as well as on the Internet and on Intranets. It can be used, for example, to control processes that are not covered by SAP R/3. Here, SAP R/3 functions can be incorporated via MQSeries and OALE Automation on Java. MQSeries Workflow has XML, Java and extensive Web client support.

Reducing the risk and effort involved in integration

The MQSeries family removes most of the incidental code that adds “superstructure” to an application – such as communications logic, business rules, data transformation and process automation – it substantially reduces the effort needed to integrate different applications, including mySAP.com components. The result is that a base for a far more flexible application infrastructure is provided.

When you remove the code that handles the sort of logic, two things happen: First, the original applications become much simpler and easier to change. Second, dispersed applications become much easier to link together and to change later. The result is a new, more flexible approach to building enterprise applications. This new approach provides the ability to extend the essential concept of ERP – integrated enterprise information and business processes – to include all of your applications.

5.2.3 Integration add-ons

SAP goes mobile

Using mobile data communication, for example, service management or sales employees can be integrated more closely into the business processes and process files more quickly and efficiently. This is made possible by “SAP goes mobile”.

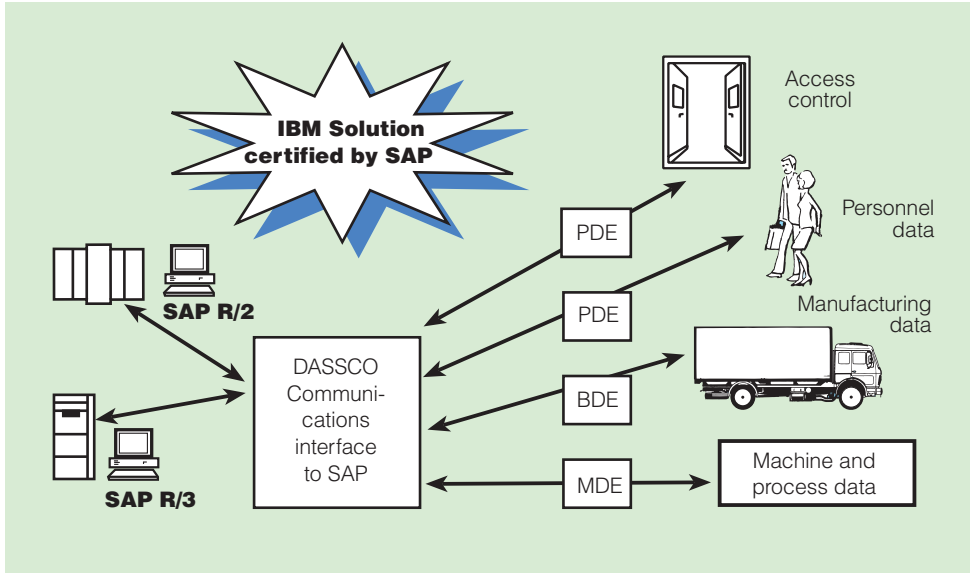
The solution design concepts are based on the standard IBM eNetwork Mobile software product or other remote access technologies. In the area of handheld applications, IBM is able to capitalize on the solution modules of the TravelCom series. Control over each connection is centrally managed and therefore enables secure access to the SAP R/3 system. This can be handled online via a SAPGUI or via the Internet by means of SAP ITS. Special applications make the targeted retrieval of information possible in uploading and downloading. In the Marketing or Service area, on-site access at customer locations to relevant information systems is made possible. For example, orders can be booked online, delivery lead times can be queried, and customer data can be entered directly. By using **WorkPad** or handheld devices, central information assets in the Logistics area can be rectified online during inventory or when logging warehouse receiving and shipping data.

Direct access to relevant information systems and data with a high rate of current accuracy contribute to a strengthening of the competitive position and increase customer satisfaction because of the greater accessibility to information.

Print solutions

The print solutions from SAP R/3 applications have been significantly expanded. With the standard SAP printer driver, from twelve pages per minute up to bulk print runs of 1000+ pages per minute can be printed on stand-alone, departmental or network printers

Intelligent data acquisition system for SAP R/2 and SAP R/3



from the SAP applications using the **IBM InfoPrint Manager**. The AFP/IPDS printing data flow provides absolute security during the print run and the output management of the InfoPrint Manager allows the cost-effective administration of printers and printing output in the network. With SAP R/3 Release 4 it is now also possible to provide feedback on print runs to the SAP R/3 user.

The IBM InfoPrint Manager is a central solution for administration of digital printing. It integrates hardware, software and services in one solution for high-performance production print runs and versatile commercial printing. With this combination and AFP, PostScript or PDF support, it is possible to print bulk runs in PostScript quality from SAP applications. The InfoPrint Manager simplifies the

print process and reduces printing costs. It combines reliable management of queues and jobs with comprehensive printing and job control. As a result, error-free printing at any point in time and from every application is ensured. Whether SAP documents are to be printed in the AFP environment as a PostScript file or whether you are printing graphic files, the IBM InfoPrint Manager always provides reliable administration for the print-out and the printer when printing from SAP applications. And with the InfoPrint Manager you can get even more out of your printing investment if, in addition to SAP applications, other host or LAN applications also have access to the printer on InfoPrint Manager.

For printed output in the AFP environment (Advanced Function Presentation), the **SAP-Print function** – an added feature of the IBM InfoPrint Manager – has been significantly improved. The SAP users receive acknowledgment messages on the job status, the documents can be appropriately formatted in the existing applications without interventions, and for security in the printout, there is also a high performance, tried and tested print process administration. With the InfoPrint Manager and the SAP print function, both the SAP OTF (Output Text Format) data flow and the ABAP line data flow can be output as AFP printing data flow on production printers with SAP R/3, release 4. For this, the Access Method E and the InfoPrint Manager must be configured as the Output Management System (OMS) in SAP R/3. SAP users receive acknowledgment messages on the status of the job processing, can abort the jobs or request the status of a specific job. The page layout of SAP documents is significantly improved by inserting electronic forms or signatures and logos. With the InfoPrint Manager the printer and linked units are managed from a central location. Jobs can be tracked throughout the entire corporation – all the way to the printing output.

DOC1 is a software solution for generating dynamic documents from SAP applications. It is designed for the banking, insurance or telecommunications industries who send information to their customers on a regular basis. With the help of database information,

these documents can be configured individually in order to appeal more specifically to customers. An additional benefit is the dynamic page setup for documents with a variable number of items. DOC1 is designed in a highly structured manner. The interactive application development is carried out separately from the production and the variety of output options on printers for all output, on fax and e-mail and archiving, meet the various requirements of the SAP applications. Whether it is the generation of documents on the SAP-application side or on the output side, DOC1 in conjunction with the InfoPrint Manager may be incorporated equally well into versatile printing output management.

DASSCO

IBM DASSCO is an intelligent data collection subsystem for SAP R/3 or R/2 users. IBM terminals, various OEM terminals, Java-based PCs and DOS PCs are supported as data collection platforms.

This solution is **certified by SAP** and can be controlled either as a blackbox from a higher-level SAP system and/or significantly expand the functionality of the SAP system as a client/server system. This solution is marketed and serviced by IBM around the globe. In addition to the technologic aspects, this is a significant reason for the fact that international companies, e.g. Coca-Cola, THYSSEN and AEG have opted for this IBM solution. Depending on the module, IBM DASSCO collects data in a relational database:

- Manufacturing data
- Personnel data
- Machine data
- Store data
- Canteen data
- Access messages.

After a plausibility and status check, this data is automatically transferred to the appropriate SAP R/2 or R/3 modules. An IBM compatible PC, which acts as a terminal concentrator for controlling the data transfer from and to the collection terminals and the main SAP computer, can also be used simultaneously with a SAPGUI as a normal SAP terminal. In addition, specific database queries enable the creation of evaluations, statistics and graphics which are not standard in SAP (cause of fault analysis, access checks, etc.) In the area of operational data collection, it is even possible to configure master mailboxes to which the BDE messages are sent for release from a master. This minimizes incorrect inputs, thereby eliminating unnecessary reprocessing in SAP.

The latest object-oriented software engineering allows the simple implementation of individual customizing and complementary functions. Administrators can modify and expand the workflow of the messages without special programming knowledge. IBM offers the complete **DASSCO solution – certified by SAP** – including hardware, software, tested installation and training at a fixed price as a ready-to-use solution.

DASSCO was already certified in 1993 by SAP for ZDE and BDE. As part of the secondary certification for SAP R/3 release version 4.6, this system was revised using the latest technology (Java, BAPI, Windows NT) to support various versions of SAP with one single software code, thus further reducing the costs of customer-specific customization.

TrustedLink Enterprise

Using **TrustedLink Enterprise** for SAP R/3, you are able to transfer documents such as e.g. purchase orders or invoices to your business contacts via EDI. Trusted Link Enterprise is an **SAP R/3 certified EDI subsystem** which is available on HP-UX, Sun Solaris, AIX and NT. The problem-free flow of your business processes is ensured by the optimum integration into the SAP-R/3 system. TrustedLink Enterprise for SAP R/3 uses standard interfaces such as iDOC or Remote Function Calls to the SAP R/3 system.

The solution also provides you the following benefits:

- a Windows-based graphic user interface greatly simplifies day-to-day business.
- very rapid lead times are achieved by the parallel processing of multiple EDI transactions
- state-of-the-art, efficient reporting tools provide you with an immediate overview of the complete EDI subsystem
- in addition to the usual EDI conversions, the EDI converter also deals with more demanding tasks such as “Any-to-any” or XML conversions.

- you can reach your business contacts anywhere in the world via the communication interface to the IBM Information Exchange Service.

Travel & Save

IBM Travel & Save RKA in symbiosis with SAP R/3 is a complementary application for the high level of business travelers in companies today (e.g. sales representatives, project engineers) for whom the up-to-date recording and processing of travel expenses play an important role.

T & S RKA is a PC program with which the traveler can log his travel data **independently of location and network** and can then calculate the expenses himself at any desired point in time. The implementation makes it possible to handle the program without complications while also providing ease of updates:

- training and handbooks are not required
- it is based on the complete company guidelines on travel
- the option of logging project/working hours is already included.

The communication of travel and expense data for downstream processing is handled optionally via the network or a bar code on the expense report printout (together with the original documents, invoices, receipts, etc.). Tests and data preparation in line with SAP are carried out in a centrally installed second program module (for reimbursement, “charging” and statistics). The required interface(s) to the different SAP modules is

(are) included in the package – modified individually by customer when necessary.

Summary:

- a solution widely proven by SAP users from different sectors and corporate sizes
- the solution with the lowest processing costs on the German market
- a complete service offer, from adapting to the travel guidelines up to outsourcing.

5.2.4 Automated Supply of Data for User Tools

Domino

Lotus offers five tools for establishing a connection between **Lotus Domino** and SAP R/3:

- Lotus Domino Workflow integration for SAP R/3
- Domino MTA for SAP R/3
- Lotus Domino Connector for SAP R/3
- Lotus Script Extensions (LSX) for SAP R/3
- Fax Connector for SAP R/3
- ESB
- SAPforms.

These new connectors were created as the result of a close cooperative effort between Lotus and SAP. These integration technologies enable customers to connect their Lotus Notes/Domino system to their SAP R/3 and to develop new types of application by connecting their messaging and Groupware platform with their business management standard software which provide a high Return on Investment. By e.g. connecting Notes-based

Workflow applications with SAP transactions, both users who do not have a permanent on-line connection (e.g. mobile users) and users who only use SAP transactions once in a while, can be integrated in SAP business processes. At customer sites where Notes is used as the strategic Groupware and Messaging platform, this can mean that 100% of all users in these SAP R/3 can be integrated into these processes without having to leave their usual notes environment. Additional training expenses are eliminated nearly completely.

Of course, Web applications can also be developed with the help of the interfaces which are described below. With them, data from SAP R/3 and Lotus Notes, for example, can be presented. User interaction is controlled by Domino in this process. Here, in comparison to usual web development platforms, a simple, reasonably priced Domino web development pays off: SAP R/3 transactions (e.g. a purchase order) can be requested from the web application. As a result, Lotus Domino supports both the “inside-out approach” via the SAP ITS and the “outside-in approach” via Domino Web application development.

SAP R/3 contains a dedicated workflow component which can be coupled with Lotus Notes using the “Lotus Domino Integration for SAP R/3 Business Workflow” product. The advantage of this is that the Domino user can be provided with the data from an SAP R/3 worklist. This information can be provided to the Domino user via applications which are mail-enabled. The enhancement

for SAP and Domino provides the possibility of displaying the work item, executing it, reserving it and flagging it as completed. The product includes an amended template for mail databases with examples of how information can be received and displayed, and how worklists can be requested in Lotus Domino. The product requires SAP R/3, release 3.1G and a minimum of Domino 4.5.

SAP Office and Lotus Domino Mail users can also communicate using a reliable interface, the Domino Message Transfer Agent (MTA) for SAP R/3. SAPconnect is configured in SAP and two server tasks are added to Lotus. End users can exchange data, including attachments, via e-mail in both directions between SAPOffice and Lotus Domino. In this way, Lotus Notes users can also read mails that were generated by SAP R/3 Business Workflow. SAP R/3, release 3.1G and higher is required.

A connector for SAP R/3 is also available for the Lotus Enterprise Integrator or LEI (formerly NotesPump). This enables a connection between Domino and SAP R/3. Using the LEI, a time-controlled bi-directional access to SAP R/3 can be carried out from Domino applications – with DECS (Domino Enterprise Connection Service) even in real-time. This can take place without the need for programming simply by filling out control documents, so-called “Activity Forms”. Thus, it can be set that master data from SAP R/3 is synchronized with master data in Notes at certain time intervals. When using a real-

time action, data is not kept redundantly in SAP R/3 and Notes. It is only displayed for reading when the document is first opened in SAP R/3.

The Lotus Script Extensions (LSX) for SAP R/3 make it possible to use SAP R/3 function requests in Domino applications. Lotus Script Extensions – which represent an enhancement of the programming environment – can be used both in Lotus Domino and in the **Lotus SmartSuite**.

As a result, it is possible to open every SAP R/3 ABAP/4 program registered as an RFC (Remote Function Call) from LotusScript using the appropriate request. In this way, the LSX create the development of applications which require bi-directional data exchange between Lotus Domino and SAP R/3. This data exchange can be executed both synchronously and asynchronously on the basis of server agents. In addition to the actual RFC functions, SAP Business Objects, so-called BAPIs, can also be triggered directly. In addition, the interface also allows the direct invocation of transactions and direct reading from SAP tables.

Using the **Fax Connector for SAP R/3** and Fax for Domino (Domino Server task), SAP users can fax easily from SAP R/3. The “Fax Connector for SAP R/3” is linked in SAP R/3 under SAP Connect (available from 3.1 onwards). In this way, purchase orders, invoices, reminders, etc. can be faxed. As an additional send history option, the SAP user

can store (non) delivery confirmations in his inbox. Incoming faxes are forwarded directly to the relevant SAP R/3 user. Based on data from the IDC market research institute, Lotus is the market leader by a significant margin in the area of groupware and with professionally-used e-mail software. Licensing is calculated on the number of connected lines not on the number of active users. This solution is offered as a package by Lotus Professional Services. This includes: Fax Connector for SAP R/3 plus Fax for Domino plus on-site installation/configuration. The Fax Connector for SAP R/3 is **certified by SAP**.

The **Enterprise Solution Builder (ESB)** is an integrated development and run-time environment specially developed for the high-performance, interactive access to back-end systems such as SAP R/3. Applications that run under ESB support the mass throughput and can work remotely from Web Clients, Notes Clients or 32-bit Windows systems.

The workflow integration based on **SAPforms** provides all the options of Domino workflow integration. More precisely, this means: loading the work item list, display and editing of SAPGUI work items, display and editing of decision work items either with SAPGUI or Notes screen, and editing form work items with Notes screen. Notes screens for form work items can be generated in an integrated development environment. No programming is necessary for this, only layout processing in certain cases. It is recommended to use the SAPforms integration together with mail integration.

Lotus 1-2-3 is being expanded so that it can analyze and prepare data from the Business Warehouse. As an example, queries to the Business Warehouse can be generated from Lotus 1-2-3.

Lotus Development, a wholly-owned subsidiary of IBM Corporation, is the world's second largest software manufacturer in the desktop area. Based on data from the IDC market research institute, Lotus is the market leader by a significant margin in the area of groupware and with professionally-used e-mail software.

Lotus SmartSuite

The benefits of an integration of the **Lotus Smart Suite** with SAP R/3 may be seen clearly. Users can access SAP business data or launch SAP business processes without leaving their familiar office environment. Training costs are lowered and analyses can be performed with the assistance of the powerful tools of the SmartSuite.

For example, SAP R/3 reports can be re-processed in 1-2-3. The integration of SAP Business Warehouse for 1-2-3 enables important information to be found and shown in a flexible manner using Warehouse. SAP business objects can be triggered via the Lotus Script Extension for R/3. Based on data from the IDC market research institute, Lotus is the market leader by a significant margin in the area of groupware and with professionally-used e-mail software. Desktop Office inte-

gration provides additional bi-directional integration options in Lotus and SAP products.

The Lotus Connection for SAP R/3 connects Lotus SmartSuite and Lotus Notes to SAP R/3. Using the Lotus Connection for SAP R/3, reports and analysis from SAP R/3 can be loaded in SmartSuite applications and processed downstream there.

Lotus Script Extensions for SAP R/3 is a development tool which extends the programming environments of SmartSuite products to include access to the RFC functions of SAP. With this powerful tool, RFC functions and transactions can be evoked, BAPIs can be triggered and tables can be read. The LSX makes additional classes for the link structure, the bi-directional data exchange, as well as the invocation of RFC functions available to the application designer. The Lotus LSX for SAP R/3 can be used for efficient creation of applications that, for example, open SAP transactions from 1-2-3.

Accelerated SAP (ASAP), a method from SAP for the accelerated implementation of SAP R/3, is also available for SmartSuite. Lotus Word Pro and Lotus 1-2-3 are supported.

SAP R/3 Desktop Office Integration, a basic SAP R/3 development product, will decisively expand the integration options. Documents, sheets and charts can be created and edited "in-place" from within SAP. Desktop Office-Integration will be available with version 4.5A of SAP R/3.

The Word Pro IMG Editor makes it possible to perform editing tasks within the SAP R/3 environment. For example, voice input can also be made with **IBM's Via Voice**.

5.3. Opening your business processes for suppliers and customers

5.3.1 e-business

The Web today is changing every aspect of our daily lives, but no other area has changed as quickly and drastically as the business world.

IBM Global Services specializes in integrating **e-business solutions** efficiently and securely into your company. This not only ensures your presence on the global market, but means that you can also take full advantage of the benefits of doing business on the Internet.

ERP e-business Collaboration Services

IBM Global Services offers customers with ERP systems the possibility to expand their ERP back-end with new e-business solutions such as CRM, SCM, e-commerce, e-procurement, e-marketplaces as well as Business Intelligence and Pervasive Computing.

For your company, "ERP e-business Collaboration Services" is the key to e-business: integration of e-business components across all of the business processes affected.

In order to satisfy your customers, suppliers must be linked to an ERP system that provides the logistics, the production and the financial process with all the advantages of

Internet integration. Only with this degree of integration can a company run e-business and keep pace with leading e-business companies in their industry (best of breed). The level of services that companies of this kind are able to provide their customers, vendors, employees, shareholders and other partners cannot be achieved without integration. The aim is to make dealers and vendors a part of the e-business process chain and to fully integrate them in the overall business process. The integration of various solutions and co-operation with the specially trained employees of IBM Global Services enable companies to show their innovative skills.

IBM e-Commerce Services

With our **e-commerce services**, we can help you to perform e-business transactions in a reliable and secure manner. Whether you wish to establish business contact with customers, suppliers or business partners via the Internet or EDI networks (Electronic Data Interchange) – we will support you with our wide range of services, from taking stock of e-business and strategy workshops, to the implementation and operation of the right solution for you. Furthermore, we also develop effective and secure systems for cashless payment transactions on the Internet.

IBM e-business Enablement Services

The main aim of our **e-business Enablement Services** is a careful analysis of the already existing infrastructures (Internet, extranet, messaging etc.), fully utilizing the IT investment you have already made and/or making

very specific new investments. Our range of services covers not only the purely technical application aspects, it also takes into consideration the existing knowledge and skills of our employees and a possible increase in efficiency due to teamwork.

IBM e-business Hosting Services

Short time-to-market, risk management and task monitoring are of great importance to every company within the frame of the Internet. IBM e-business Hosting Services help you to meet these requirements. Our services range from the creation of a simple Website to the provision of a complete e-commerce environment linked to the structures of your company, enabling you to fully exploit the possibilities of the Internet.

IBM Distributed Learning Services

IBM Learning Services integrates cutting-edge training methods into your qualification offensive. **Distributed Learning** is technology-based learning: using multimedia CD-ROMs, access to training on the Internet and intranet, in virtual classrooms with support from teletutors and in exchange with other students, with online support when working with new applications.

Distributed Learning presents your company with a number of options which can be implemented as part of a qualification solution and brought quickly and specifically to every workstation.

5.3.2 IBM SAP Internet Consulting

The new SAP development mySAP.com has made standard software fully capable for the Internet. The SAP Business Framework forms the background structure here; BAPIs guarantee access to the relevant Business Objects. In addition, the SAP Internet Business Framework and an XML capability open up the possibilities of the Internet for the overall system.

To be successful on the Internet requires consulting expertise. IBM combines experience as a consulting and implementation partner in the SAP environment with extensive expertise in the area of e-business. For the successful implementation of SAP Internet projects, IBM offers a comprehensive service package that extends from support during the introduction of the SAP Internet solution to the development of complex customer-specific e-business solutions. Contact us. We can develop the optimized solution for you.

5.3.3 Business process support

With the **iPlus** service we offer the option of creating and adjusting so-called Internet application components, in addition to the technical link to SAP R/2 and R/3 systems. These are tailor-made to meet individual customers' needs and to provide the corporation's presence in the Internet. The opportunities which are thus opened to a customer may best be seen in a concrete example:



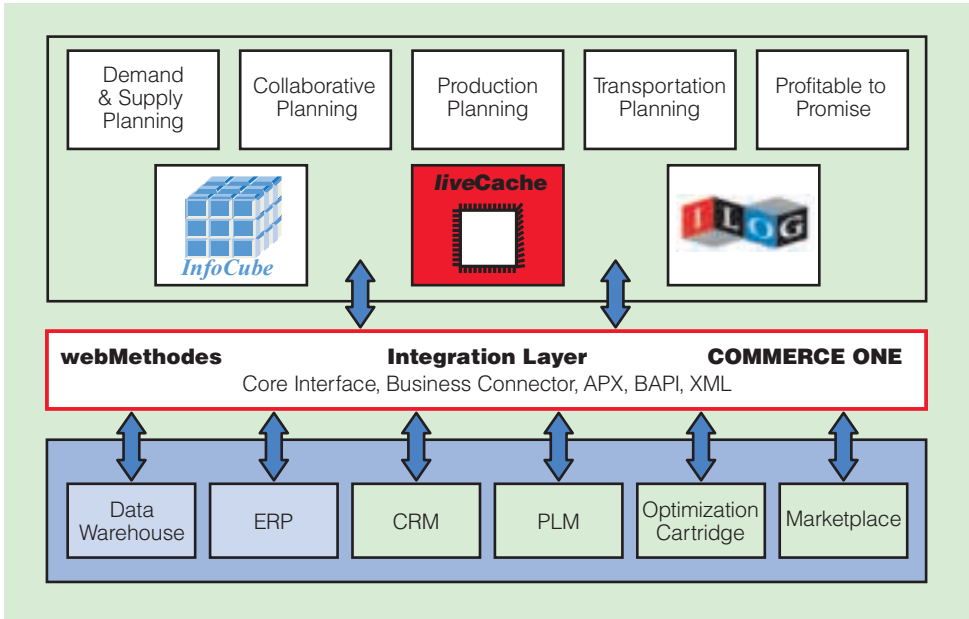
A company's sales force can initiate workflow processes in the SAP system via web-compatible browsers – without the need for paper or additional preliminary systems. In addition to a purchase order system, using order logging and follow-up e.g. customer reports can be set up and travel expenses can be calculated. The following concrete benefits are thus provided for the Field Service employees: they do not have to be trained on SAP and are able to access up-to-date data via an easy-to-use, standard system that is available any time and any place. In addition, companies profit from the low administration costs. Based on the uniform Internet technology, Internet application components can also be used outside of the internal corporate Intranet in the Extranet or Internet without ad-

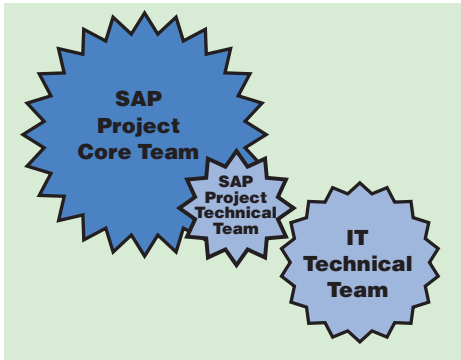
ditional costs. With this doorway of opportunity opened, company limits are left behind and business processes can be globalized.

5.3.4 Supply Chain Management in the SAP environment

With **Supply Chain Management** we mean the active design, ongoing mobilization and improvement of the supply chain between suppliers, production sites, transport companies and customers. This is achieved by all parties agreeing on current and planned deliveries and services. This can be achieved very efficiently using networked IT systems (e-business). In this way, the best products from various suppliers can be used depending on the situation and requirements.

SAP APO: Smooth integration with standard interfaces





IBM offers services for

- Analysis of the current situation
- Improvement of business processes
- Independent selection and analysis of products
- Designing the SCM system up to complete implementation and optimization of SCM solutions, even using products available on the market, such as SAP APO.

SAP APO is a tool for the integration and synchronization of supply management processes. It is used for planning, optimizing and scheduling activities and stocks. Using SAP APO can improve the performance of a supply chain and reduce costs. This can increase a company's competitiveness and the satisfaction of its customers.

SAP APO uses up-to-date data from existing transaction systems (e.g. SAP R/3) for forecasting, planning and up-to-date control for ongoing and planned processes. The up-to-date information is kept in the Business Warehouse (BW) and in a “live cache”. The data is sent from here to APO modules.

The APO modules perform comprehensive planning, simulation and forecasting functions with regard to requirements and supply as well as for production and transport – a convenient way to optimize profitability.

The InfoCube provides important information in such a way that optimized decisions can be made. The Solvers use up-to-date mathematical optimization processes to create the best possible forecasts. The integration in existing system landscapes takes place via a separate integration layer.

5.4 IT Infrastructure Services for SAP environments

With its **IT infrastructure services** for SAP R/3, IBM provides the basis for a reliable and efficient operation of business critical applications under SAP R/3. The services cover all phases of the implementation and operation, from planning the IT landscape, conceptual design and implementation up to the day-to-day operation. It is not only business processes that are affected by the introduction of SAP R/3, there are also significant changes to the IT environment.

In a number of different SAP R/3 projects on OS/390, AIX, OS/400 and Windows NT platforms, IBM has gained experience that has been used to develop the international global IBM SAP R/3 implementation method **Method Blue**. Within this method, the IT infrastructure services for SAP R/3 cover the following areas:

- infrastructure planning and architecture consulting
- installation of the project environment
- conceptual system management design
- structure of the production environment
- planning and support of the productive launch phase
- support for ongoing operation

For practical reasons, the IT infrastructure services should be integrated at the beginning of the SAP R/3 implementation. They are a significant part of the project and should therefore be taken into account in both the SAP R/3 implementation project and general decisions on infrastructure.

As part of a one-day project scoping workshop, an experienced consultant will work with the decision-makers at the client company to analyze their specific requirements. The objective of the workshop is to identify processes which are especially critical. For processes that are not particularly specific to the customer, IBM offers a standard proposal which is based on experience gained from comparable successful projects.

The critical processes are then dealt with in more in-depth workshops. By involving the specialists, an introduction to the specific SAP features of the processes is given which works out the needs and requirements in detail so that both IBM and the client can gain a mutual understanding of the project contents. As the SAP R/3 implementation project usually requires a development system for demonstrating the functionality of

the SAP R/3 system, a reliable working system environment must be set up very quickly.

In structuring the developmental environment, the primary focus is not so much incorporation into existing IT processes or those yet to be developed, but on fast implementation and stability. As an alternative to installing the system in the customer environment, IBM can also provide a system via a remote connection. This system can also be equipped with the SAP IDES database. As a result, data processing personnel can concentrate entirely on the conceptual plan for the future production environment.

Normally, an SAP integrated system consists of three SAP R/3 systems networked via the correction and transport system: the development system, the consolidation system and the production system. In addition, a system and client concept also provides answers to the following questions:

- How do you ensure that production-related data can be found on the consolidation system – even after the productive start – allowing convincing tests to be carried out?
- How and where does acceptance testing of new engineering designs or customizing take place?
- How are performance forecasts obtained?
- How are backups created for customizing in the course of the project?
- How and where do end user training sessions and prototyping take place?
- How are SAP R/3 release updates carried out?

The design of a high-availability SAP R/3 environment is started on the basis of the requirements of the customer. Factors to be considered:

- server hardware
- operating system
- network
- database
- application

The first step towards achieving **high availability** lies in preventing failures using active redundancies. These are units that function in parallel such as hard disks, controllers or transmission routes which maintain functionality in the event of the failure of one of the units in the pair. The monitoring of these redundancies is critical for an up-to-date exchange or repair to be initiated. We will support you in the selection of components and in the monitoring process, either using remote alert management or by implementing the customer's own alert management system.

By assuming the role of a database server or a central instance by an application server, the SAP R/3 system can be secured against the failure of critical servers. The transfer can be automated using cluster tools (e.g. HACMP/6000 or MSCS).

Database mirroring can be used as described above to prevent errors on the disk subsystems. However, this does not help with logical inconsistencies which can be attributed to e.g. administrative errors, as these can be seen on the copy. To ensure effective protec-

tion here as well, IBM implements shadow database concepts. A **shadow database** is a database replica that is replicated at an earlier time and thus enables the database to be set temporarily to a time in the past. Furthermore, a high-availability solution is guaranteed at the application level by the installation of quality assured change management processes.

Our high-availability solutions can also be implemented to extend beyond multiple computer centers. In this way, you are protected against a catastrophic event. The time restrictions for the backup and restoration of the SAP R/3 database are of critical importance for the conceptual design of the data backup. Here, the available concepts allow operation with almost zero downtime in an extreme case. In each case it is advisable to use the implementation of SAP R/3 to set up a company-wide backup concept – if this has not already been done.

Any changes to settings or programs within the SAP R/3 system are made using the SAP correction and transport system. We will show you how you can use these tools in your project with optimum results. This also includes dealing with special systems, e.g. for release updates, for company developments or for setting up a new additional system.

The change management tools are supplied as extensively as possible with the SAP R/3 software, but the processes must be defined as early as possible for each customer.

The SAP R/3 system has a highly suitable tool for monitoring the SAP R/3 system – the **Computing Center Management System (CCMS)**. If, however, monitoring is to be performed outside of SAP R/3 or across a large number of SAP R/3 systems, the installation of the **Tivoli System Enterprise systems management framework** is highly recommended. With the implementation and customization of the Application Management module for SAP R/3, this critical application is also incorporated fully into the monitoring and controls. For our small and medium-sized clients, we also offer monitoring solutions which, as opposed to the CCMS, focus totally on the operation of one or fewer SAP R/3 systems.

Although SAP R/3 is a dialog-oriented system, professional job scheduling is also required, especially for controlling more than one SAP R/3 system or interface between SAP R/3 and other systems. As a rule, external applications will need to be implemented for this, which can control other systems as well as SAP R/3. We advise you on the selection of suitable **scheduling tools** and their optimum incorporation into SAP R/3. Only excellent SAP R/3 know-how can enable efficient control in this area. The IBM range of services also includes the implementation of Tivoli Workload Scheduler or Tivoli OPC and its connection to SAP R/3.

The reliable **control and archiving** of printouts from the SAP R/3 system is an integral part of the implementation project.

Targets here can include:

- standard printouts
- the operating system
- rapid problem analysis
- support of both workstation and mass printers
- integration into the change management process
- reproduction of documents already created (e.g. invoices)

Using **IBM CommonStore**, SAP R/3 documents and printouts can be archived very quickly and cost effectively. This solution can then be extended further by including the archiving of incoming documents (e.g. letters and faxes) and their integration into the SAP workflow.

The success or failure of a company often depends on the success or failure of the SAP R/3 implementation. Therefore, during the course of the project

- function tests
- integration tests
- mass tests

must be used to ensure that the defined processes can actually be implemented in practice. The planning and performance of mass tests, in particular, is an important part of the **IBM IT infrastructure** services for SAP R/3. This ensures that the response times in dialog mode and the run times of batch runs correspond with the expectations of the users. By including the SAP **GoingLive-Checks** and implementing their results and individual de-

tailed analysis, customer-specific performance problems can be eliminated.

During and after the initial productive phase, the performance of the SAP R/3 system is optimized.

This is necessary in order that unexpected system loads do not occur as a result of customizing and in-house development for the customer.

IBM Global Services offers tuning measures in terms of:

- customizing
- program optimization
- database
- SAP R/3 profiles
- operating system
- load distribution.

5.4.1 EarlyWatch

EarlyWatch is a preventative service which identifies specific bottlenecks in the SAP R/3 system. Any potential problems can therefore be detected and corrected at an early stage to ensure optimum system availability and performance.

By means of regular remote diagnostic procedures (up to twelve per year), detailed analyses are carried out in the area of SAP applications and configurations, as well as in the database, operating system and network components of your SAP R/3 system.

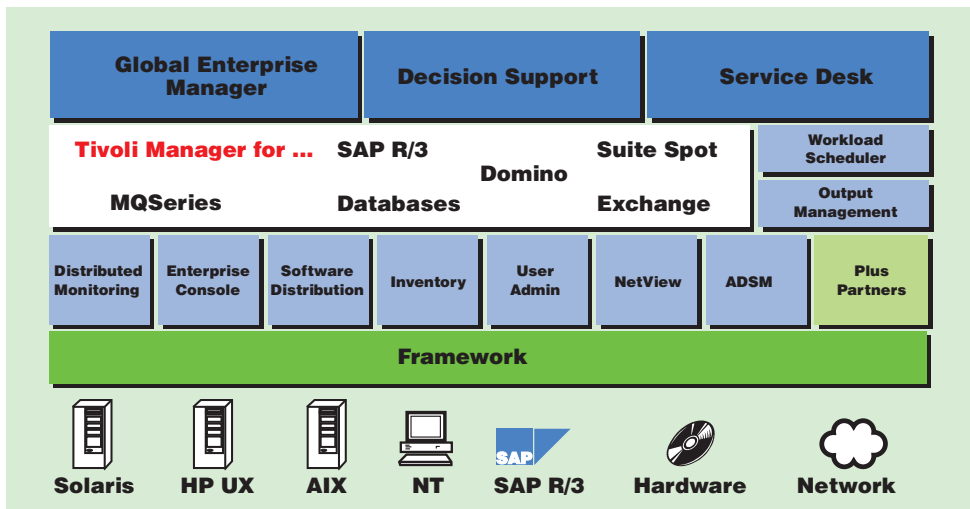
A toolset integrated within SAP R/3 periodically collects performance data. This data is

transmitted via a remote connection (e.g. X.25, ISDN). Experience gained from numerous SAP R/3 installations enables the EarlyWatch team to carry out a reliable analysis of the SAP R/3 system performance data that is currently available. Data protection is ensured by access to a separate “client” and a personal user code and password.

As an EarlyWatch customer, you will receive a detailed report on your SAP R/3 installation following each diagnosis. This will contain analyses and recommendations on system tuning and problem resolution.

EarlyWatch provides you with a cost-effective overview of the system behavior of your SAP R/3 and enables you to detect potential bottlenecks at an early stage and eliminate them before they cause problems.

The objective of the **GoingLive check** is to secure the preparation for productive operation with SAP R/3, the introduction of additional SAP R/3 modules or a functional upgrade (e.g. from SAP R/3 Release 3.x after 4.x). During these tests, individual system components are analyzed. Recommendations are given for optimizing the SAP R/3 system and for resolving any existing problems. In this way, system availability and performance can be improved significantly. It is possible to identify and resolve any performance problems which may occur even before the productive launch. The *GoingLive* check comprises three checks. *GoingLive* for Upgrade is carried out in two checks. All checks



take place at specific points in time before and after the productive launch:

- **Analysis.** During the first check the main system components of the SAP R/3 system are analyzed. The operating system parameters, database configuration, SAP R/3 base system, distribution of the SAP work processes to the individual instances and the relationship of the planned transaction volume to the existing hardware resources are all tested. The analysis session should take place approx. two months before the productive start.
- **Optimization** (not for *GoingLive* for Upgrade). As part of the second check the specific key transactions of the customer are tested in much more depth in terms of their resource consumption and time response from a user point of view. On the basis of these results, it can be established whether there is a

need for changes to the database configuration, adjustments to the SAP R/3 system or adjustments to the existing hardware configuration. Generally, this check is carried out four weeks before the start of productive operation.

- **Verification.** In the concluding session, the system components and the effects of changes made in previous checks are tested. This check is carried out after the SAP R/3 productive operation has already commenced. The verification session should be planned for around four weeks after productive start.

The individual checks are executed as a remote service with the help of integrated tools and checkout procedures. Service activities are agreed upon with the relevant employees of the company before, during and after each of the service sessions. As a result of the checks, the customer will be sent an individual service

report after each of the tests. This report shall contain the results, as well as recommendations for optimizing the SAP R/3 system. In addition to the GoingLive service in the startup phase, it is also recommended that the EarlyWatch service carries out regular system analysis.

5.4.2 Tivoli Solution for SAP

The implementation of SAP in a company today has far-reaching consequences for the processes and the IT landscape. In the majority of cases, the aim is to achieve improvements in the critical business processes, i.e., not only does SAP help with the integration of all business units and their processes, it also helps with the overall optimization of the dominant processes in the area of the Extended Enterprise environment (traditional ERP + Internet), e.g.:

- Order-to-Delivery
- Customer Relationship Management
- Supply Chain Management
- e-business
- HR Management.

The challenge now lies in attaining the most efficient conversion of these processes and the factors that differentiate a company during the implementation of SAP. Other important IT processes are:

- Availability Management
- Security Management
- e-business Management
- CC operation (Operations)
- Storage Management.

The IT processes must ensure the operation and therefore the availability of all SAP systems. Only in this way can the performance of the business processes mapped in the SAP system be guaranteed. The extension of the traditional ERP approach to include e-business structures (**XRP** = extended ERP) also makes it necessary to incorporate general company business processes in a comprehensive Enterprise System Management. As the customer is “only a click away”, the availability of an e-business system (e.g. using the SAP backbone) can be of vital importance. It is therefore applicable more than ever to proceed with a standard system management process.

These are the challenges for the Extended Enterprise environment:

- Optimum use of resources, i.e. to free qualified employees from time consuming, dull and repetitive standard activities (automation).
- The configuration of efficient work processes which eliminate traditional “card catalog methods” and manually updated operations manuals (knowledge management).
- Control over the growing complexity of the environment in which new technologies (networks, hardware, applications, XML, etc), with perhaps more heterogeneity, are provided by SAP and e-business solutions (e.g. by installing UNIX or virtual shopping lines). Above all, a greater number of internal and external interfaces are provided (during the implementation, old system integration, etc.)

- The guarantee of optimum service at internal/external customer locations (specialist divisions) up to 7 day/24-hour availability
- The optimum scalability of IT processes and of IT operation as the basis for future growth.
- Management of the required capacities (especially in the area of storage)
- Ensuring a reliable security infrastructure that discovers and prevents intruders and unauthorized access at an early stage.

The primary objective of the **Tivoli System Management solution** (for SAP) is therefore the provision of a comprehensive toolkit to carry out the following tasks:

- maximum availability of all managed resources, including their restorability
- optimum performance of managed system components
- simple distribution of critical components (e.g. programs, operating manuals, and applications)
- top-to-bottom security for the execution of all tasks ("secure delegation")
- ensuring the operation of all critical applications.

The Tivoli Management components, which contain all of the important e-business elements (web server, ITS, firewalls), enable the virtual shops and web sites of many companies, which are becoming increasingly important, to be included in a standard Enterprise System Management.

The **Tivoli Management Framework (TMF)** is the core of Tivoli. It forms the basis for all Tivoli System Management components. Many product components require TMF. The TMF provides the essential basic services for system management. It allows the cross-platform system management of NT to OS/390. TMF includes the following features:

- a uniform user interface for the TMF and the components structured upon it
- a multi-layer architecture that allows the management of up to 400,000 resources
- standard communication protocols based on TCP/IP
- a distributed object database for all administered resources
- the authorization and authentication, resulting in the secure delegation of tasks
- policies for the administration of objects with similar attributes (e.g. all NT servers, all sales printers, etc.)
- configuration and change management for all Tivoli components, including TMF.

The TMF is based on the open and widely supported **CORBA 2.0** standard. It contains a large number of open interfaces that can be used for dedicated enhancements. In addition, a series of toolkits is available for the TMF:

- an integration toolkit, based on the Application Management Specification
- Tivoli Event Integration Facility (EIF) for the integration of events in the TMF
- Tivoli Application Development Environment (ADE) enables radical modification of the TMF and the services constructed on it.

Central Event Management with the **Tivoli Event Console (T/EC)** is one of the most outstanding Tivoli components. It enables the revaluation of events based on rules and patterns from the whole Tivoli environment (Tivoli and allied components). This results in an intelligent evaluation of complex fault situations. Furthermore, automatic responses to recognized fault situations can be triggered by means of the T/EC. The T/EC also assumes the role of central problem analysis within the SAP environment.

The SAP landscape consists of a large number of application components. Especially worthy of mention here are the various user interfaces, for example the SAPGUI. In order to ensure the simplest possible maintenance of these elements, Tivoli Software Distribution provides the capability for distributing components securely, with automation and across any platform. It is also possible here to centrally preconfigure complete workstations (e.g. that of an SAP financial accountant) and to install them onsite depending on the user.

The fundamental basis for all-inclusive system monitoring is the network management system. Embedded in the TMF, **Tivoli Netview** enables SNMP-based, dynamic network monitoring which can forward identified and filtered events to a centrally located T/EC for problem analysis.

In this way, critical information on the availability and performance of all critical network components such as routers, hubs and

LAN/WAN links of differing technologies (Ethernet, Token-Ring, ATM) can be monitored in the SAP environment.

The heart of the Tivoli solution for mySAP.com is the **Tivoli Manager for R/3** (TM for R/3). It is based on the Tivoli core applications “Distributed Monitoring,” “Software Distribution” and the Tivoli Event Console (T/EC). Using predefined metrics, rules, distribution packages and actions, TM for SAP R/3 covers the management of the following areas:

- Forward-looking monitoring of the availability of all SAP R/3 systems
- Automation of recurrent actions (monitoring and management)
- Software distribution of critical elements (e.g. SAPGUI via netinst integration)
- Secure delegation of actions by means of object-based security controls.

The TM for SAP R/3 is a completely complementary solution to the SAP CCMS system for versions 3.x and 4.x of the SAP R/3 system. It is based on the evaluation of Shared Memory and CCMS data which are raised by Tivoli-based ABAP function modules. The TM for SAP R/3 can be supported here by the security mechanisms, policies and role definitions of the Tivoli Framework. Automatic system recognition (Autodiscovery) and the instrumentation for the depiction of business processes (instrumentation for Tivoli Business System Manager) have been standard since version 2.0 of the manager for R/3.

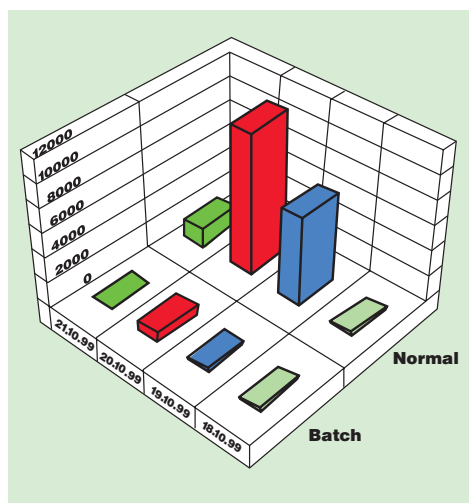
Tivoli Decision Support is seen as an addition to the Tivoli Manager for SAP R/3 and enables multi-dimensional analysis to be carried out on the huge amounts of data that occur in daily SAP operation. Together with the asset management of the Tivoli Service Desk components, the TDS provides a continuous measurement of the current operation status, operational performance, efficiency of the CC operation (e.g. solution times) and can therefore deliver the current service level. By incorporating the SAP statistic information, TDS provides a flexible tool for the latest requirements in the area of SLA Management and reporting. TDS therefore plays a key role in the definition of Service Level Agreements.

The incorporation of the database as a core component is essential for a comprehensive management of the SAP R/3 environment. There are specialized Tivoli Managers for

Oracle, Informix, DB2 (including OS/390) and MS SQL servers for this purpose. In a similar way to the Tivoli Manager for SAP R/3, the **Tivoli Manager for databases** contains specialized functions for monitoring the management of the SAP R/3 database and for the distribution of critical components e.g. Oracle Net protocol adapter etc. Finally, any occurring faults are forwarded to the T/EC and, if necessary, eliminated by automated tasks. Corresponding sets of rules for the T/EC and task libraries are supplied with the Tivoli Manager for databases.

The database management incorporates functions such as backup/recovery using the standard SAP R/3 products SAPDBA, BR (only ORACLE/Informix) or the database-specific backup methods. (In this connection, refer to information on the integration of Tivoli Storage Manager and Data Protection for R/3.)

Dialog Count



The Tivoli Workload Scheduler for R/3 (TWS for R/3)

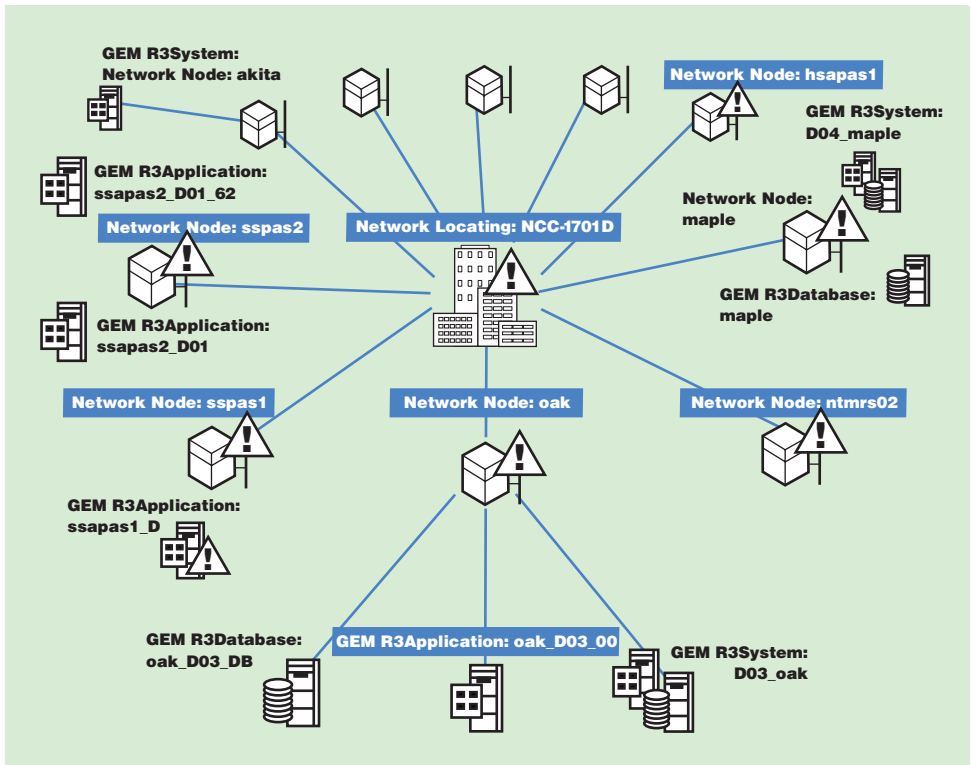
offers all the required performance features for the management of jobs and job networks with the integration of the SAP R/3 systems via the certified SAP XBP interface. With this, it is possible to specifically transmit jobs in one (or more) SAP R/3 systems, to monitor them and to react to their results. As a result, the management of all critical batch processes throughout the company (both within SAP and externally) can be ensured from one central point.

Tivoli Data Protection for R/3 is used to set up the integration of R/3 in the Tivoli Storage Manager. This enables a centralized data backup of all SAP-related data stocks. This includes not only the SAP R/3 databases, but also all system components and profile data. With Tivoli Data Protection for R/3 (extension to TSM) and its **certified XBR interface** (previously: backint), consistent data backup of the SAP R/3 databases is possible. This ensures a seamless link with SAP-dedicated database utilities (SAPDBA, etc.). With TDP for R/3, it is thus possible to fully automate backup jobs. This includes the event-driven

backup of archive logs from an Oracle R/3 database, for example. In addition, flexible data backups and complete availability concepts can be generated using the combination of the Tivoli Workload Scheduler and TWS. As a result, the availability of an SAP R/3 system can be significantly increased.

An important add-on that can be provided are the so-called **“Admin-Tools”** for TDP for R/3. These provide a Java-based front-end for convenient query and control of TDP for R/3.

Tivoli Business Systems Manager – Hyperview of R/3 systems



Firstly, the **Tivoli Business Systems Manager** provides the industry with an integrated view of the critical IT systems and the business processes based on these. As present, the topology information necessary for this is already collected automatically from the Tivoli Manager for R/3, MQ Series Link for R/3, Tivoli Manager for Lotus Notes/Domino, e-commerce applications and others. Based on the generic configuration of an SAP R/3 system (the dynamic allocation of the application server to the central database server), the complete business logic can be constructed from these components in one simple design stage. The verification view allows the complete process system to be tested before it is put into production.

Integrated logic and incorporated administration tasks enable the complete monitoring of the business sequence. Drill-down functions and navigational aids, such as the Netview methods, enable a problem to be quickly limited, without disregarding existing links and the influences of external systems. The presentation of TBSM is thus a suitable user interface for all users, ranging from the Operations Manager to the CC Operator. Integrating the Tivoli Event Console with automatic and interactive workflows guarantees the realistic reproduction and control of all system landscapes associated with the business processes. Here, the Tivoli Framework inherent in the system ensures the reliable delegation of tasks, e.g. administrative tasks.

Benefits and uses of the Tivoli solution for SAP R/3:

- **Comprehensive management of all business processes.** Complete management of all significant company business processes is possible with the Tivoli solution for SAP R/3. As a result, you will achieve not only a more favorable cost/benefit ratio for the IT process organization, but also a quicker ROI on the overall SAP investment. In the same way as SAP itself, Tivoli – with its core competence in system management – can help to optimize IT processes.
- **The provision of a comprehensive “e-infrastructure”** for all company divisions, i.e. the management of the whole company topology and, if required, of several firewalls (for example, if the internal company WAN must be replaced by the Internet).
- **Service level management for internal and external service providers.** The comprehensive service for internal and external customers is a significant driving force for future IT landscapes. The Tivoli solution for SAP responds fully to the constantly growing demand for measurable and reproducible results in the IT services provided. The use of Tivoli Service Desk in conjunction with Tivoli Decision Support, in particular, allows the multifaceted analysis of problem situations in the SAP environment, the historical development of performance bottlenecks as well as the bandwidths and capacities required for trend analysis and planning. The constant management of the service level in

the company context can reduce the occurrence of problem situations (system engineering or user-related) and thus make a decisive contribution to better service for internal or external customers. This can also lead to a higher overall acceptance of the SAP environment.

- **Secure delegation of all critical tasks.**

Tivoli's integrated security conceptual design (as an integral part of the Tivoli Framework) guarantees the specific sharing of responsibilities and reliable delegation of tasks. The misuse of available tools can thus be excluded from the very outset.

- **Disaster recovery as life insurance for the whole company.**

In addition to mobile and immobile assets, data stocks are part of the essential capital of a company. Like insurance for mobile and immobile assets, the “insurance” of company data stocks is an integral part of the Tivoli solution for SAP. The basis for a comprehensive fail-safe concept is created by embedding Tivoli Data Protection for R/3 in other components such as Tivoli Workload Scheduler for R/3 and Tivoli Manager for R/3. By combining these with high availability solutions (e.g. HACMP) failure security rates in excess of 99% may be achieved. The Tivoli solution for SAP can therefore make a significant contribution to safeguarding important corporate assets.

- **Application-based Management.** The Tivoli solution for SAP is based on the existing SAP application interfaces (BAPIs). Several prod-

ucts are “BAPI Certified” (Tivoli Data Protection for R/3, Tivoli Workload Scheduler for R/3). This ensures that the customer is provided with the application-based performance of all operations in the SAP environment (“application awareness”) which is confirmed by a **certificate** from SAP. This security guarantees the problem-free interconnection of Tivoli solutions for SAP and SAP applications.

- **Growth Guarantee.** As a result of the high scalability of the Tivoli Management Framework, up to 400,000 terminal nodes (PCs, servers, etc.) can be managed. As a result, the Tivoli solution for SAP can very easily follow the customer's growth. It therefore represents an investment guarantee for the future, allowing the management function to keep pace with customer requirements. In the end, a management solution is only as good as its flexibility and ability to adapt to customer requirements.

5.4.3 Data backup and archiving

SAP R/3 systems control a large number of operational processes. To do this, they access information assets which reflect the products, warehouse inventories, structures and contacts of your company. This data that is integrated in the SAP R/3 database thus becomes the core of your company's processes. For this reason, protection of this data from loss because of defects or logical faults or from destruction due to catastrophic events is a fundamental component of every operational design concept.

The electronic **archiving** of data/documents with the functions integrated in SAP R/3 serves to increase productivity in handling managerial processes:

- old data (from reorganization runs) for rollout from the operative database
- print lists
- outgoing documents
- incoming documents, e.g. scanned invoices, faxes, etc.
- local data, e.g. graphics, spreadsheets, texts, etc.

The following criteria are of prime importance for data backup and archiving:

- high reliability and reproducibility of the process
- short downtimes to ensure high availability
- optimum utilization of resources
- maximum flexibility for tailoring to individual circumstances

With the **Tivoli ADSTAR Distributed Storage Manager (ADSM)** IBM offers a tool which satisfies all of the requirements for professional data backup and archiving. For customers whose main focus is optical archiving and a demand for corporate-wide document management, CommonStore – the document management system from IBM – is an ideal additional product.

The intelligent **SAP-certified BACKINT/ADSM (BC-BRI interface)** interface programs for data backup provide a seamless link to the ADSM and IBM archive systems, as does CommonStore (ArchiveLink inter-

face) for data archiving/document management. It is because of these requirements in the SAP R/3 environment that IBM upgrades these programs on an ongoing basis. Requirements are:

- handling of high data rates
- high availability
- professional system management
- tailoring to individual circumstances:
BACKINT/ADSM works together seamlessly with SAP DBA, the tools for data backup of R/3 ORACLE databases. It supports all platforms and AIX, NT and UNIX systems of other manufacturers
- DB2-ADSM integration
- For customers who have decided to implement DB2 with SAP R/3, the ADSM interfaces are provided as a no-cost component of the standard SAP-R/3 base software. BACKINT is not required for this.

Magnetic tapes (capacity, recording speed, rollout) are preferred for data backup, while optical disks (access speed, retention time) are preferred for data archiving. Magnetic disks are particularly well-suited for intermediate data storage. Because of the versatility of the ADSM, VisualInfo and OnDemand client/server products, the IBM solutions can be incorporated with SAP R/3 systems on platforms supplied by different manufacturers. ADSM supports a large number of storage devices from different manufacturers as well as magnetic disks, magnetic tapes and optical disks. The expected storage volume makes the use of robots a logical choice for automatic storage administration. Corre-

sponding archive systems are found in the following IBM product offerings:

- Tape archive (IBM 7331, IBM 3570, IBM 3590, IBM 3494)
- Jukebox (IBM 3995).

In addition, IBM offers qualified services for the creation of concepts, implementation and maintenance. Thus, IBM provides complete solutions for SAP R/3 data backup and archiving, from consulting on the concept right up to the hardware – all from a single source.

IBM's licensed Backup and Recovery Media Services/400 (BRMS/400) program supports automated tape backup and archiving functions, recovery services and data media management for all tape and archiving systems that can be connected to AS/400. The backup and recovery strategy is defined by means of multilevel policies in a menu-driven OS/400-consistent environment. With the "dynamic retrieval" function, archived database files can be automatically retrieved as soon as a program requests them. Data backed up via the server component of ADSM (ADSM/400) that is available on AS/400 can also be incorporated into a backup/recovery concept based on BRMS/400.

BRMS/400 is a prerequisite for the operation of a tape library on AS/400 (e.g. IBM 3494). Furthermore, it should be incorporated into an SAP R/3 operation concept on AS/400 if a policy-driven backup/recovery concept or a tape administration system is to be implemented via one (or more) systems.

5.4.4 IBM CommonStore

mySAP.com created new possibilities for the partnership between IBM and SAP. In order to be able to offer joint customers a complete archiving solution at attractive terms and with reduced implementation expense, IBM Content Manager CommonStore was **certified at SAP**. If you are looking to archive old data, incoming and outgoing documents from SAP R/3 or to incorporate company documents into a company-wide document management system, then **IBM CommonStore** is the ideal solution. In conjunction with the worldwide leading products of the IBM Content Manager family, it combines professional functionality with high reliability and scalable performance.

IBM CommonStore archives and manages all the data and business documents in your company in one integrated digital archive. All the information is then also located "in" R/3. This allows you to expand your SAP application and accelerate your business processes. Awkward paper handling is omitted and the information flow in your company becomes fully electronic – an important step towards e-business. At the same time, you improve control over the growth of the SAP database and can thus improve the performance of your SAP applications in the long term.

IBM CommonStore performs three important tasks with a unified, integrated solution:

- **SAP data archiving:** The SAP database grows with the use of R/3. By transferring

old, inactive data, you improve the performance of the overall system and create space for new data. This provides you with a solution to the problem of continuously growing memory requirements in R/3, one that will continue to be effective in the future.

- **SAP document archiving:** All documents that are edited in SAP R/3 or created using SAP R/3 (incoming / source documents, print lists, etc.) are converted into “electronic documents” and efficiently managed and archived using IBM CommonStore. Incoming mail is scanned in and copied into the SAP system – the paper original can be destroyed. Documents created in the company no longer need to be printed “for filing” – filing is now digital. The storage complies with legal regulations (true to original document) on optical disks or magnetic tapes. All documents are integrated into SAP and can be opened by mouseclick.

- **Company-wide document management:** In addition, you can manage documents and data from other applications in the same archive system. This enables you to create a unified solution both for the SAP and the non-SAP area. The electronic documents are available to every employee at every location in the network within seconds – per Internet also worldwide.

Perfectly integrated in SAP

IBM CommonStore can be seamlessly integrated in your SAP applications, and this is ensured not only by the certification of SAP

itself. IBM CommonStore has been officially **certified** by SAP (incl. the new ArchiveLink HTTP interface) and can therefore be smoothly integrated into your SAP system. The advantages of this solution are thus available to all SAP users, independent of hardware and operating system.

All functions are built in directly to the graphical user interface of SAP R/3. An SAP user can open, read, edit, comment on, print, enlarge and of course save a required document with a few clicks. This enables your company to increase its reaction capability and avoid slow processes with paper, in-house mail and archive space. The division between a computer-based organization and a conventional office organization comes to an end; SAP controls all business processes and documents in unified manner. This enables you to make full use of the potential of your SAP solution and make your processes even faster, better and safer. You increase the productivity of your employees, reduce operating costs, and improve your customer service.

Your entry into e-business

IBM CommonStore also simplifies handling of business transactions across the Internet. Once your business documents are available in a digital form, there is nothing to prevent you from opening them via the Internet, exchanging them electronically with customers, partners and vendors or doing business online. This enables you to start your e-business and gain significant competitive advantages.

More space, more speed

What are the advantages of IBM CommonStore in day-to-day practice?

- **Rapid, uncomplicated access to important documents.** Documents do not have to be fished out of folders or archives – the electronic documents appear on the screen with a click or two.
- **Better customer service.** If a customer calls, the clerk immediately has all the documents available and can thus react more quickly.
- **More productivity.** All documents are integrated in SAP and can be incorporated in a predefined process using Workflow. IBM CommonStore fully supports the SAP R/3 Business Workflow.
- **Effective business processes.** You now also use SAP to control your documents, optimizing your business processes from procurement through production and financial accounting to sales and distribution.
- **Nothing gets lost anymore.** Mislaid papers? Incorrectly filed documents? Lost copies? No more!
- **Improved teamwork.** A number of employees can work on the same document at one time.
- **More security.** Access to electronic documents can be much better controlled; in the case of confidential documents, the risk involved with a copy is eliminated.
- **Space saving.** IBM CommonStore enables the use of optical storage systems or tape robots in which millions of documents can be stored safely and at low cost. You gain office space, space that is not cluttered with filing cabinets; archive rooms become superfluous.

- **Sufficient storage for R/3.** You can combat the growth of R/3 memory requirements and do not have to constantly re-equip with hard disks.
- **Improved Performance.** Transferring old data stocks out of R/3 database accelerates your applications and is recommended by SAP.
- **Utilization of your investments.** You deploy your R/3 system for additional tasks and there make better use of your investment.
- **Lower costs.** The personnel and material expense for processing and archiving data and documents drops dramatically.

IBM – you can rely on us

Handling large volumes of data is something that has to be learned. IBM has been a master of this art for many years. In the form of IBM CommonStore, you are provided with a solution containing comprehensive IBM know-how and extensive experience in data management. And you have a reliable partner who is also available to you in the future – in much the same way as your data.

More than 25 000 customers, including numerous renowned companies from the fields of industry, trade, services, chemicals, technology, energy supply as well as banks, insurance companies, and public authorities, place their trust in IBM archive solutions.

Highlights

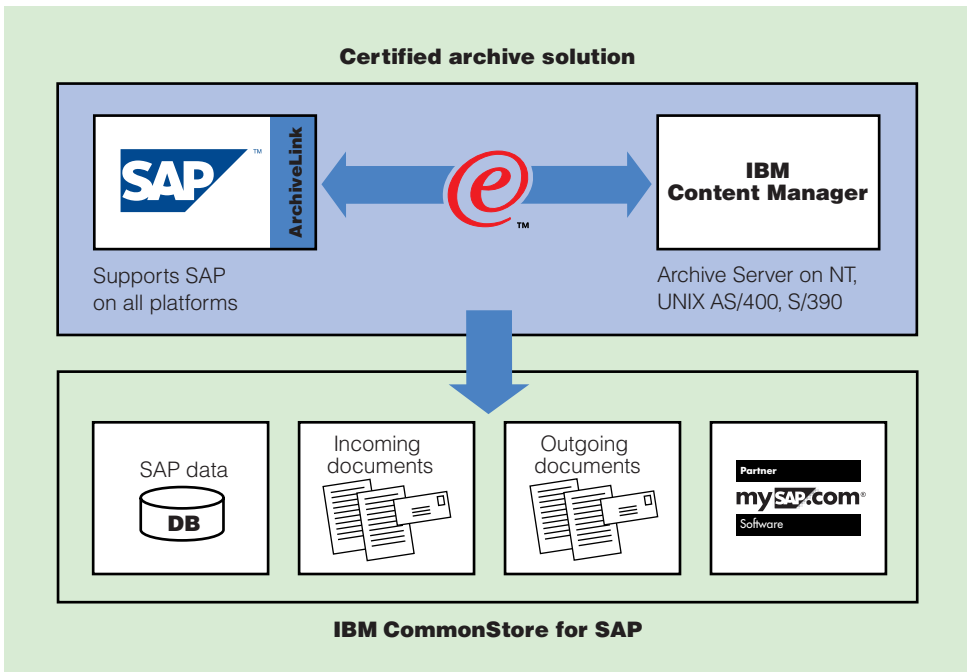
- IBM CommonStore supports Tivoli Storage Manager (TSM), IBM Content Manager and Content Manager OnDemand

- Archive server available on various platforms (NT, AIX/UNIX, AS/400, S/390)
- Fully integrated in SAP R/3 (via SAP ArchiveLink)
- mySAP.com certified by SAP
- Ideal for SAP data and/or document archiving
- Particularly recommended in the context of the conversion to the Euro
- Enables company-wide uniform archiving for SAP R/3 and other applications
- Fully Internet-compatible
- Supports a large number of storage media (including magnetic tape and optical disks/ WORM).

IBM CommonStore for SAP is an integrated and high-performance solution that uniformly manages and archives the various documents and data.

Archive Development Kit (ADK)

IBM offers efficient archiving in the SAP R/3 system with its **Archive Development Kit (ADK)**. In the SAP R/3 system, a large volume of data accrues in the database as a result of the business transactions in individual applications. In the event of capacity or performance problems, data which is no longer required by the database from the view of the SAP R/3 applications can be relocated from the database. SAP offers standard archiving programs for the most important business



transactions. From release 4.6, these programs are based on the ADK with the following benefits: connection to an archiving system, compaction during archiving, archiving in the running system, high operating convenience, network diagram graphics, and access to individual data objects in the archive.

Database-oriented archiving using ADK is similar to table structures (fields). It is differentiated in principle from document archiving by using optical archive systems via ArchiveLink. Scanned original documents or print lists generated in SAP R/3 via **ArchiveLink** are filed here in optical archive systems. Documents and lists archived in this manner can be displayed again via

ArchiveLink. However, they cannot simply be evaluated with SAP R/3 media or loaded into the SAP R/3 system. The following scenarios are not covered by the SAP standard:

- Customer-specific SAP tables from internal or modified business transactions are not recorded in the supplied archiving programs.
- Data from external systems (business transactions before SAP introduction, data from other departmental areas) cannot be integrated into the SAP archiving database.
- Evaluation programs are **not** provided as standard or they do not cover the needs of the users adequately.
- Evaluations generally span only one business transaction since archiving objects also represent a business transaction.
- Missing or inadequate combinations for the evaluation of data in SAP tables, archived SAP tables and archived data from external systems.

- Direct access to an individually archived business transaction or interrelated business transaction is not possible.

As a supplement to the SAP standard, all additional or desired functionalities can be carried out using ADK. The Archive Development Kit (ADK) provides the capability for developing standardized archiving programs as well as associated programs for deleting, reading and reloading. Dedicated archiving objects which accurately reflect customer-specific business transactions are defined. These archiving objects are the basis for archiving or subsequent evaluations.

If archiving functions are to be incorporated into a customer's own application programs (reports, transactions), or if you require similar archiving functions in different departmental areas, we recommend the development of dedicated archiving classes. These encapsulate all of the specific information concerning the data to be archived. This means that you no longer require detailed knowledge of the specific managerial object as you no longer have to carry out the technical implementation.

Developments with the ADK supplement the SAP standard in an ideal manner when it comes to archiving and subsequent evaluation. ADK-based supplements are standardized and effective applications. They provide a high level of data security together with unlimited evaluation options. The archiving of a customer's own data is fully incorporated in-

to the SAP environment by the customizing process. Therefore, the user does not notice any difference between SAP standard archiving and handling his own archiving tasks. In addition, extensive customer-specific online help provides assistance in every archiving step. With the direct access to business transactions in the detail provided by the database tables, it is possible to reconstruct and display documents. As a result, double archiving in the form of SAP print lists can be restricted. Through the application of HSM systems (Hierarchical Storage Management), random access to archived data is possible at any time and in any time slot. In conclusion, it may be said that all practical requirements for archiving can be fulfilled by installing ADK in conjunction with the SAP standard.

5.5 Consulting Services for mySAP.com

IBM Global Services is one of the largest SAP consulting partners worldwide – we are recognized as a partner on all SAP levels. In running a large number of worldwide SAP projects and in the implementation of SAP in our own company, IBM has been able to gather a considerable amount of expertise, which is now available to you.

Our objective is to ensure that you receive expert consulting from a single source to implement solutions that are tailored to suit your individual needs. Whether on an industry-specific, complex or international basis – our consultants can help you to achieve your goals in the SAP environment, to develop and implement a tailor-made solution for you.

5.5.1 IBM SAP Project Management

The introduction of standard software requires a tried and tested, standardized operating procedure that ensures a rapid and efficient implementation. It is designed to maximize the results of your project investments by harmonizing your processes, systems and organization with your business strategy.

MethodBLUE is distinguished by the following strengths:

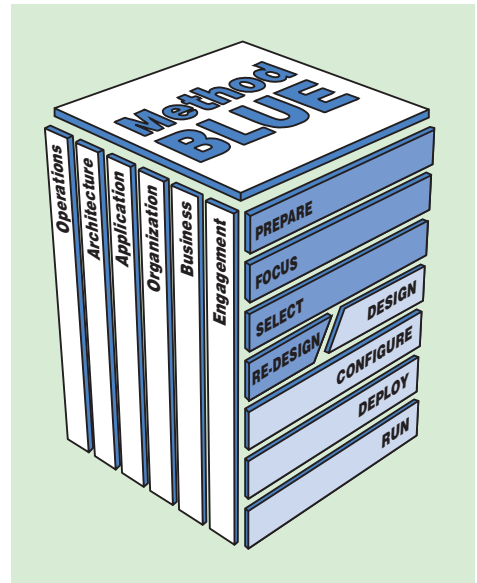
- **Experience and expertise.** MethodBLUE satisfies this requirement by introducing the experience it has gained from a number of successful ERP implementations around the globe.
- **A standard approach.** MethodBLUE is a comprehensive and consistent approach which is applied worldwide for consulting and implementation. It also offers the ability to conclude international projects and to exchange experience on an international basis – it is the common language of all IBM consultants.
- **Possible areas of application.** MethodBLUE can support you in every phase and element of your SAP implementation, whether it is the optimization of your business processes, the automation of your workflows, or a complete replacement of your IT system.
- **Versatility.** With its modular structure, MethodBLUE can be configured to suit the

individual demands of your project. It can therefore be deployed as profitably for major projects as it can for medium-sized and small-scale projects.

The quicker your SAP R/3 system is implemented, the sooner your business can benefit from it. MethodBLUE shortens the implementation time by using a high volume of data, information, knowledge and ideas – thus bringing the “intellectual assets” of IBM to your company. This also includes contributions from our business partners and software suppliers.

IBM was awarded the **“Powered by Accelerated SAP”** certificate by SAP for its MethodBLUE. This means that the capabilities of **ASAP** can also be provided to you as part of an SAP R/3 project with IBM. In addition, MethodBLUE contains procedures and tools that accelerate and facilitate an SAP R/3 introduction even more, e.g.

- AdvisoryWare: a software tool with “Best Practices” – enables the documentation of a business case, the registration of measurement criteria for the performance of business processes and the comparison of different options.
- Industry-specific reference models provide you with support during the creation of your company model.
- MethodBLUE offers extensive work packages for business process engineering, design of the customer's structural organization and change management.



- Project Office – a tool based on Lotus Notes for controlling the whole project enables, among other things: project activities to be followed up and monitored, it supports project team communication, project result management, administration of reusable documents, workflow support, status follow-up, discussion forums and change management administration.

As an integrated solution provider, IBM Global Services can offer you a total “lifecycle” solution to transform your business, i.e. from defining the requirements of your business and the application system to selecting the standard application package and the design and implementation of the selected ERP.

With its versatile options, MethodBLUE covers the following areas:

- **Commitment.** Project and risk management, quality assurance and communication.
- **e-business.** Analysis of actual status, definition of business strategies, design and redesign of processes based on industry sector expertise and best practice.
- **Application.** Design, configuration, integration, documentation, testing, end user training, data migration, productive launch
- **Organization.** Redesign of the organization, change management
- **IT infrastructure.** Requirement analysis, redesign, installation, training and IT resources.

MethodBLUE describes the service portfolio of IBM. It differentiates itself from its competitors with its clear goal orientation, a process which promotes success in business.

5.5.2 IBM standard software and SAP implementation consulting

It is a fact that the transformation of a company is best achieved by introducing standard software systems. It may even be that the transformation can only be achieved once the software itself has been implemented.

It is only in the interaction with an adequate change in business practices that the efficient selection and introduction of standard software systems such as SAP R/3 can represent

a quantum leap in the sense of achieving strategic objectives and cost efficiency. IBM offers an important consulting component specifically for this purpose – **Package Enabled Business Transformation (PEBT)**.

Advantages for you:

- a company consulting method that is structured around your business strategy. It ensures the necessary corporate-wide transformation.
- a way of thinking as part of corporate consulting that is based on experience in business processes and in the complete transformation of companies.
- a corporate consulting service with levels of expertise and experience in the implementation of standard software systems and information technologies that are unparalleled on the market.

In real terms, for you this means: a qualified business partner who will assist you in carrying out the transformation of your business processes, information systems, organizational and control systems – in short, someone to support you through all types of change and transformation.

The IBM PEBT method

- has a modular structure and is phase-controlled e.g. regardless of whether you have already decided on SAP or not, the PEBT consultants from IBM will ensure that you achieve the best possible benefits for your company development and ROI from the software implementation.

- All IBM PEBT consultants must have demonstrated their industry sector competence and SAP application expertise in a certification process. In this way, the PEBT method makes it possible to bridge the areas of business process reengineering and software implementation – areas that were traditionally only loosely associated with each other.
- It relies on business process reference models which represent the “best practices” in the specific industry sector and which are continually enhanced on the basis of project experience. Together with the PEBT consultants' skills in the industry sector, these reference models enable the efficient re-engineering of the business processes relevant both to the industry and to SAP R/3.
- For many industries, complete industry solutions already exist; the degree of their tailoring is evaluated in the context of the PEBT project.

The IBM PEBT method combines re-engineering with the software implementation, i.e. consistent performance of:

- problem and objective definition
- recording of actual status
- analysis of needs and areas of weakness
- creation of performance specifications or target conceptual design
- optimization of business processes
- system selection and generation of the functional specifications
- detailed design

- planning of the software implementation with the user departments involved guarantees a successful conclusion of the project.

5.5.3 IBM Industry Consulting for mySAP.com

IBM has invested in knowledge of industry sectors, applications and interfaces and thus possesses a series of solutions which provide logical supplements for your SAP R/3 system. IBM consultants who possess the knowledge to meet industry needs can help you with your specific requests for SAP R/3.

We can provide you with qualified consulting for SAP industrial-sector solutions. Our product offering here includes:

- conceptual design
- requirement analyses
- user design concepts
- optimization of business processes
- introduction of the respective industry modules
- industry-specific consultancy
- parameterization, customizing
- project support
- project execution
- user training seminars
- integration tests
- interfacing of operative systems/data import into the data pool interface programming/customizing (ABAP, database skill)
- data analysis
- project management and project control

In addition, we have developed industry solutions through collaboration with our business

partners. You can find out more about this topic in chapter 5.7 – Industry-specific supplements to the SAP system.

5.5.4 EuroDrive4SAP – Euro conversion in the SAP environment

The conversion of SAP systems (R/2 and R/3) to the **Euro** requires careful planning and preparation. The conversion of the currency used in SAP is to be seen in the context of the overall company strategy with regard to the Euro. In addition to the conversion date itself, possible changes in consumer behavior, the emergence of new competitors, pricing policy and the way the company is perceived by customers and suppliers must also be determined in relation to the Euro. If the SAP system is linked by interfaces to other applications, the conversion activities must also be tuned for each individual system. IBM provides support in all phases of the transition process involved in establishing the ability of a company to work with Euro.

The following services are usually required for the support and planning of a company currency conversion:

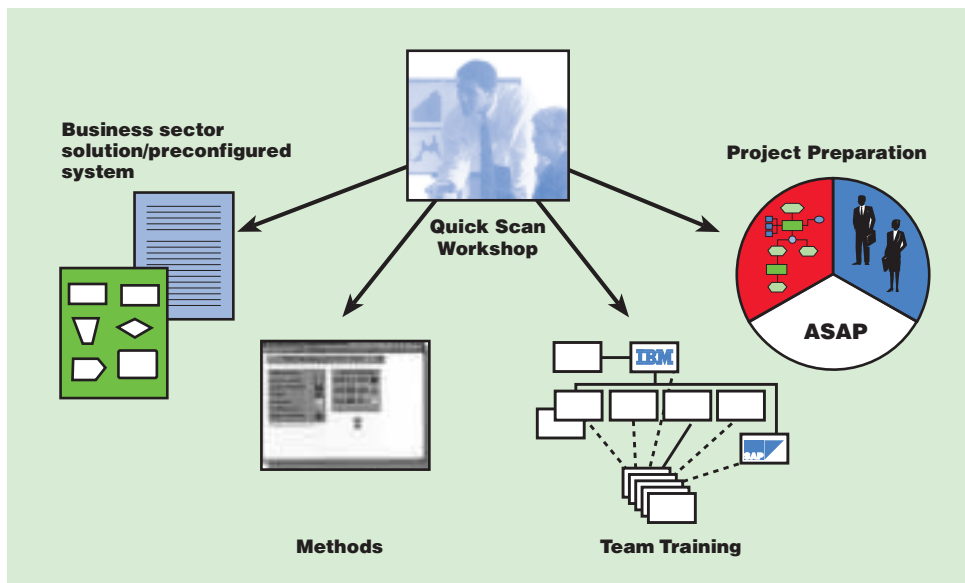
- carrying out an analysis workshop
- base support
- database support
- provision of test systems
- support in the creation and realization of an archiving concept

The aim of the analysis workshop is to understand the environment of the company

currency conversion from a technical point of view, to establish the current Euro preparations of a company and to analyze the SAP database in relation to problems or faults. The analysis includes all SAP modules on which the conversion of the company currency is planned and carried out. The workshop results in a general project plan being developed which takes into account the individual customer requirements and the analyzed system status. Only after the analysis has been carried out can a reliable estimate be made as to the duration of the project and the resources required.

A detailed activity plan can then be drawn up for the company currency conversion based on the general plan. To provide support for the actual conversion, there is an experienced team of consultants whose expertise has already been demonstrated in successfully concluded conversion projects. Internal training courses and a regular exchange of experience between the consultants ensures a continual transfer of knowledge.

A test system with the customer's current data inventory (with the possible use of external IBM hardware during the test phase) can be provided as and when required. We offer the support of experienced base consultants and ABAP developers to carry out adjustments to the current release status (release changeover or hot packages), analysis of data stocks and adjustments to dedicated developments or interface programs.



The run time of the conversion program and the extent of the system downtime associated with this is a potential problem in the conversion of the SAP database. To reduce the conversion time required for the company currency conversion, SAP recommends that the size of the database is reduced using archiving documents. It is also important here to bear in mind the financial audit of the business in each company and to check whether the required lists can be provided to the auditors after the conversion to the Euro.

In particular, not only the SAP product should be examined, but also all the upstream and downstream products. There partial areas especially are frequently overlooked. Our range of services includes providing support in the creation of an archiving

concept as part of which the business management requirements (which documents can be archived, what access requirements exist, etc.) are analyzed and suitable technical solutions developed for them. IBM is able to provide a comprehensive solution for its implementation.

5.5.5 IBM Services for mySAP

Using the components of **mySAP Human Resources (HR)**, you can not only consistently utilize your company and personnel data, promote internal and external knowledge transfer and improve global cooperation, but also accelerate business processes, achieving cost transparency and saving time.

In addition to the “classical” functions of HR software – such as remuneration settlement,

time recording/time management and trip costs accounting – HR also provides the following components:

- **Organization management.** This enables posts and functions to be defined; allowing you to administer your job planning effectively.
- **Personnel development.** Here, the qualifications for the corresponding positions are specified; additional qualifications can also be taken into account here. To enable you to better assess the results of your employees, there is the possibility to define sample assessments for different areas.
- **Training and event management.** The primary aim is to determine the further training need of your employees by comparing the required skills for a post with the present qualifications. Corresponding proposals are then made with regard to internal or external events that could balance out any gaps in skills that were revealed.
- **Personnel recruitment.** This component enables you to detect vacancies at an early stage and to identify potential successors without difficulty. External recruitment is also made easier by an exact skill definition for the position to be filled.
- **Remuneration management.** This enables you to create incentives for employees by linking remuneration components with the extent and development of personal skills.

mySAP HR gives you a proven HR solution that helps you to run HR management that is specially geared to the needs of your company. The many years of experience as operator of SAP systems for our customers have enabled the IBM HR experts to establish a comprehensive range of skills. The implementation of mySAP HR as well as continuous maintenance of the SAP applications by experienced consultants round off the range of services.

5.6 IBM SAP R/2 Services

Today, SAP R/2 still acts as the backbone of commercial information processing for more than 500 customers.

Comprehensive consulting and support are also offered to SAP R/2 customers as a complementary service and in coordination with the positioned SAP R/2 services of SAP.

Experienced consultants work together in specialized teams to provide our SAP R/2 customers worldwide support, especially in the following areas:

- Data migration with the IBM migration services for SAP R/2 – SAP R/3 migrations for all platforms
- Migrations design workshop for the efficient planning of your migration plans
- SAP R/2 strategic consulting: situational analysis for SAP R/2 customers, strategic recommendations and project planning
- Maintenance in the application and base area
- Euro implementation
- Outsourcing of SAP R/2, SAP R/3 and associated services
- Document management and archiving with CommonStore

5.7 Industry-specific supplements to the SAP System

Every industry has its peculiarities and places demands on an efficient IT solution. Only experts are able to find out reliably where the problems lie. IBM consultants who possess the knowledge to meet industry needs can help you with your specific requests for SAP R/3.

5.7.1 SAP Industry Sector Solutions and IBM Add-ons

Years of experience in SAP consulting for the implementation of standard modules in all industries has prompted IBM to apply its knowledge of industrial sectors to its **consulting for SAP industry sector modules** as well. For this reason, IBM has invested in industry-related expertise and offers services and supplementary software for SAP industry sector solutions. Our offer includes:

- Preparation phase:
 - Feasibility studies for industry sector solutions and conceptual design
- Implementation phase:
 - SAP implementation
 - End user training
 - Infrastructure/Platform
- Operation:
 - Systems Management Add-Ons
 - operational support, maintenance.

5.7.2 SAP Retail – the SAP stock inventory management system for retail

A cutting-edge merchandising system must meet ever-growing requirements. It must reflect complex company organizations and

meet the challenges of a changing marketplace quickly and flexibly.

SAP Retail establishes new standards here. With its flexibility and adaptability, it combines the benefits of a standard solution with the tailor-made, ingenious functions of individual systems.

SAP Retail lends itself especially for installation in retail companies with a heterogeneous company structure. The objective of this system is the closed mapping of the value-added chain from the supplier up to the end consumer and the optimization of the various processes and control operations in the flow of goods and information between suppliers, retailers and consumers.

SAP Retail integrates the essential divisions of the retail trade and the different logistical stages. To achieve this, SAP Retail is based on the well-known concepts of retail merchandising in the different merchandising lines e.g. in the fields of food, fashion and hardware. The implementation of marketing strategies to control product lines, prices and campaigns has been integrated into SAP Retail. SAP Retail is a total management solution which also considers the specific needs of accounting and human resources in the retail trade. Of particular note, is that the synchronization of the volume and goods flow is guaranteed.

SAP is developing new products for the retail trade which will supplement the existing

proven retail solution with its focus on the back office: **SAP Retail Store** is a solution for branch stores that is based on distributed data. The **SAP Retail Online Store** allows customers to order merchandise via the Internet. Payment is handled by means of SET, a standard which provides increased security for e-commerce.

IBM is a partner in the SAP Retail development. Firstly, IBM was involved in the design development of the data model for SAP Retail. IBM also supported SAP in the conceptual design of standard benchmark evaluations for SAP Retail.

With the “**Retail Interchange**” data converter, IBM provides one option for interfacing to SAP Retail with external systems. This enables reliable data exchange between SAP Retail and the various point-of-sale and store merchandising systems. With the versatility, portability, scalability, security and user-friendliness which has been attained, “Retail Interchange” can ideally fulfill a wide range of tasks while setting new standards in its applications area.

- The locations of the coupled applications as well as the data formats employed may be flexibly selected by means of “Retail Interchange” and can be mapped with one another.
- The portability is distinguished by the differing platforms on which “Retail Interchange” is available. “Retail Interchange” can also be integrated in any network systems for data transmission or data logistics.

- The portability enables the IT environment to be expanded.
- Security is ensured by mechanisms in the transaction processing and mirroring technologies.

The problem-free function of “Retail Interchange” interacting with SAP R/3 was certified for the most recent **release by SAP**.

With the help of IBM's “**Retail**” **industry model** a target concept for your company can be developed very effectively, since all important retail-specific processes have already been ideally documented here and only need to be tailored to specific corporate requirements. The requirements that match with SAP R/3 Retail are defined in the modeling tool (e.g. ARIS) during fine-tuning of the concept targeted to the individual company. With this operating procedure, the degree of coverage provided by SAP R/3 Retail for the specific retail company can be determined quickly and conveniently, as can the areas in which actions for individual developments or process tailoring are needed. This can mean a significant reduction in the implementation time.

5.7.3 SAP Banking

Market globalization, internationalization of customers, company mergers and a flood of legal regulations set the framework for activities in the dynamically competitive arena of financial service providers. The technology used is just a tool – it is both optimum business processes and time-to-market that are the critical factors. Using standard software

instead of software developed in-house can help to keep up with changes in the market.

The standard SAP software provides a comprehensive solution for both current and future market requirements. Using the modular approach of a total banking solution, every bank can start with certain modules depending on its primary focus and flexibly expand these to meet growing requirements:

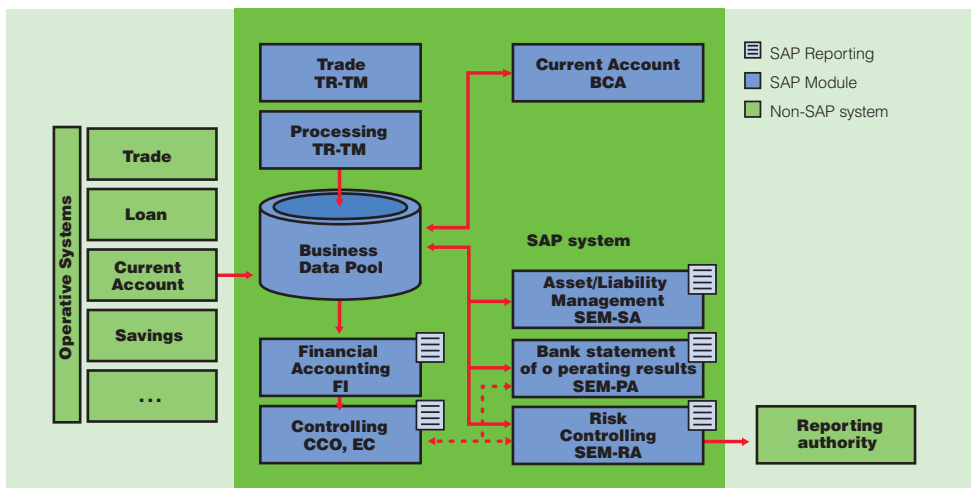
The area of **Strategic Enterprise Management (SEM)** includes the following components:

- Profit Analyzer
 - Individual transaction /single position costing
 - Bank profit and loss account
- Risk Analyzer
- market risk
 - GAP analysis
 - Net present value analysis
 - Value-at-risk
 - Credit / default risk

- Strategy Analyzer
 - Asset Liability Management (ALM)
 - Advanced Performance Measurement (RAROC)
- Bank Analyzer
 - Balance Analyzer
 - Internal and external reporting.

Using the SEM module enables the cause-related allocation of business profits and costs and a standard calculation rate for single business up to total bank operating results, a standard risk definition for market and credit risks and provides up-to-date and specific control information to company management.

Today, **the area of Core Banking** includes the administration of master data (e.g. central business partners, products, terms and limits) and current accounts (**BCA – Banking Customer Account**), as a first step towards a comprehensive retail application. SAP plans



to introduce further components for the areas of savings, term deposits and loans.

The area of Customer Relationship Management will, in future, include high performance modules for market research, campaign management, customer analysis and product development. This is expected to be completed in the next two years.

The area of Business Management offers proven standard modules for financial management, asset management, human resource and material management. These are:

- Financial Accounting (FI)
- Fixed asset accounting (FI-AM)
- Controlling (CO) – overhead, product costs controlling, operating results statement
- Executive Information System (EIS)
- Human Resources (HR)
- Materials Management (MM)
- Cash, security and derivate handling (CFM)
- Loan administration (CML).

Due to the modular structure of the application, every bank can flexibly structure the industry sector solution in accordance with its primary focus and expand it to meet growing demands.

Our SAP consultants possess in-depth industry expertise and can assist you in implementing your business goals in the course of your SAP R/3 implementation. Our banking consultants possess the relevant specific professional expertise in all areas required in an

implementation of SAP Banking. In our **International Center of Expertise (ICoE) Banking** we have assembled a team of international experts, bringing together global project expertise and experience. The number of successfully implemented SAP projects it has carried out means that IBM Global Services can offer a “best practice” solution to suit every customer requirement.

With our **IBM Global Demobank**, we have developed an integrated, predefined SAP banking system for SEM, BCA and Business Management components. This enables you to considerably speed up the implementation of your requirements, especially in the design/concept phase – with advantages such as early, visible project results, prototyping and project team training.

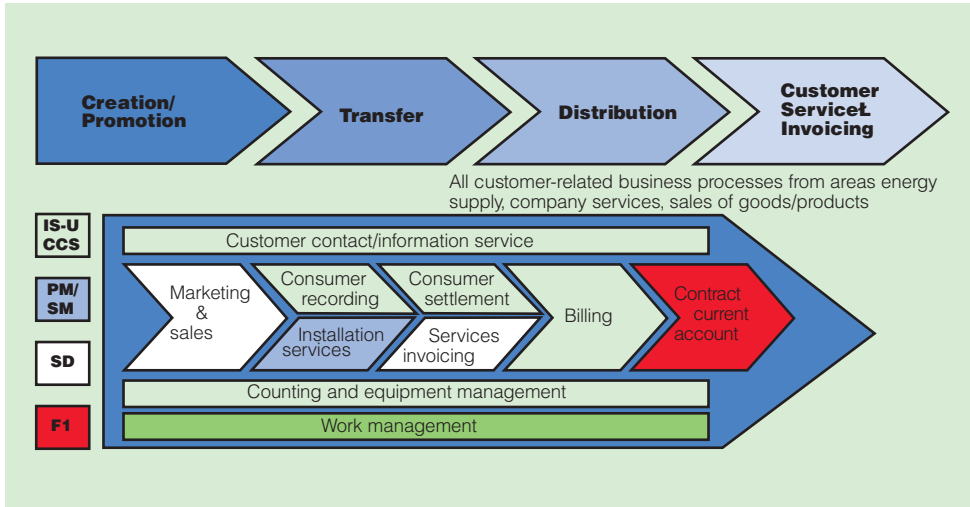
Total integration with Enterprise Application Integration

Complex data structures and data distribution in the bank's own systems make conventional data transfer in SAP Banking difficult. Using software tools (e.g. MQSeries, MQIntegrator and MQAdapters) as well as our expert knowledge in the area of “external data transfer”, IBM offers an overall solution for all questions regarding implementation of SAP Banking.

5.7.4 IS-Hospital – SAP R/3 implementation in hospitals

We can offer you the comprehensive implementation of the SAP R/3 procedures including the industry module **IS-H** (core business

Scope of performance of the system IS-U/CCS



management processes in the hospital) and **IS-H med** (ward communication). This comprehensive package covers all aspects from management information systems such as Cyber+View, archiving solutions and multimedia patient files, to completely bi-directional links between heterogeneous subsystems. The IS-H patient management and accounting system supports all patient-related processes in both inpatient and outpatient areas. IS-H enables a fully-integrated monitoring of the service process and links to a number of subsystems.

5.7.5 SAP Utilities – SAP R/3 for utilities companies – the solution for a customer information system and customer billing system

The SAP R/3 **IS-U** industry solution is particularly suitable for use by the utilities

industry. It maps the core processes of an energy supply company. Integration is ensured with the complete incorporation into the standard module.

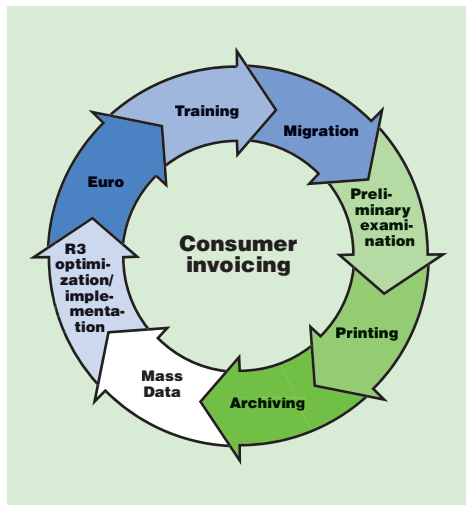
On the basis of proven commercial operations in this industry, IS-U offers a flexible architecture with which any power and utilities company can tailor the system to meet its management needs. IS-U enables billing for the classic divisions of power, gas, water/sewage and remote heating. Waste disposal as well as cable services may also be billed as individual divisions. Furthermore, service orders, service contracts and merchandise sales can be billed using the “service and sales” component. Whenever desired and appropriate for scheduling, all services can be consolidated onto one invoice and billed together. Furthermore, the invoicing supports the calculation and collection of taxes, fees and du-

ties. These divisions and services can be processed by either single or multiple utilities or services companies. If the company has several partners, one of the companies assumes a certain amount of the services for the other companies (joint billing of services on one invoice, for example). The central data object in the IS-U system is the customer.

Using the central partner model in SAP R/3 he can assume different roles. The basic functions of IS-U are:

- administration of master data
- reading
- charges and invoicing
- machine administration
- customer service
- open account contract

IBM/SerCon offers the following services for billing:



Based on experience gained in implementing SAP industry solutions, we have developed procedures that enable a quick and efficient implementation.

5.7.6 Predefined SAP Systems

Based on experience gained in implementing SAP industry solutions, we have developed procedures that enable a quick and efficient implementation.

IBM SMOOTH Services

Companies require sophisticated software solutions that permit the flexible, transparent and rapid control of their processes and ensure maximum efficiency in the use of scarce corporate resources. Furthermore, companies expect that these software solutions will be implemented rapidly and cost-effectively. To make this possible, we provide preconfigured systems, documentation, demo systems and training material. In this way, we can implement solutions tailored to customer needs, whether per individual or Ready-to-Work implementation.

IBM SMOOTH Services for SAP means a more rapid and cost-efficient SAP implementation with the help of:

- predefined IBM SAP industry solutions, in part Ready-to-Work qualified
- profound implementation experience on the basis of the SAP ASAP (Accelerated SAP) method and MethodBLUE
- the “Ready to Run” solution package – consisting of hardware, pre-installed base and application software

These three elements significantly reduce project planning and customizing costs. The many years of experience with SAP – resulting from various SAP projects – has enabled IBM to develop predefined industry solutions.

SMOOTH for Retail – the industry-specific solution for specialized retail on the basis of SAP Retail

Lengthy implementation times coupled with high financial costs hinder small and medium-sized retail companies from implementing SAP Retail. For this reason, IBM has developed an industry solution for the furniture industry, consumer electronics, home & hobby, and building materials, as well as for comparable product ranges or sales structures. These not only help to significantly reduce implementation and costs. As the expertise gathered around the globe by the IBM implementation teams is incorporated into the solution, the customer is also presented with the “best practice” of a state-of-the-art solution.

EASY – SAP R/3 Ready to Work

Medium-sized production companies are constantly being faced with new challenges. Due to progressive globalization, the only way to survive is to develop new markets, take advantage of new opportunities and to stand up to new competition. Medium-sized businesses have to keep up with shorter innovation cycles, cope with falling profit margins by increasing efficiency, carry out the necessary conversions to the European Currency,

while continuing to maintain cost transparency in their own production. New state-of-the-art systems support these aims with innovative concepts. **EASY**, based on SAP, enables you to meet these challenges. EASY opens the door to the innovative world of SAP, taking your requirements into account.

Criteria for the implementation

Many years of experience at IBM Global Services with medium-sized manufacturing companies in the implementation of business standard software form the basis for meeting your requirements. This is reflected in EASY:

- EASY is an industry-specific solution with a high degree of coverage for your core processes.
- EASY is a solution for medium-sized companies certified by SAP Ready-to-Work
- From signing the contract until the start of productive operation, the project takes a maximum of six months.
- You have absolute cost transparency in the project
- The security of a qualified and release-insensitive solution
- Smooth data transfer.

Our package includes the implementation of the following functional areas and modules:

- Installation: base
- Accounting: FI, CO and AA modules
- Logistics: SD, MM and PP modules

With our specific approach we are well-placed to offer you an SAP system that is tailored to meet the requirements of your specific industry. An SAP project is not, as often presumed, purely an EDP project; it is an organizational project in which the whole organizational structure and processes within the production company must be analyzed and optimized. This often results in changes being made within the company. Once accurate analysis and the subsequent design have been carried out, EASY provides the customer with a customized solution that fully adapts the new system to the requirements of the customer.

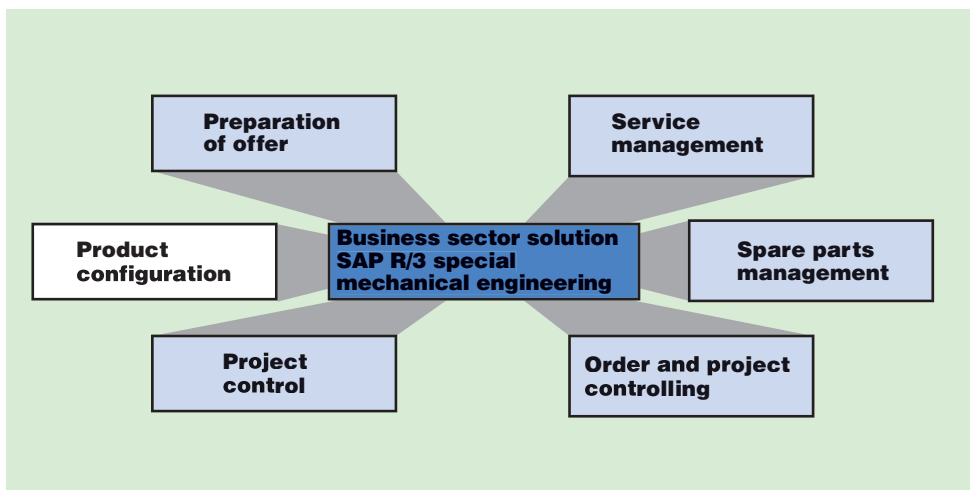
EASY ETO

The **EASY ETO** (Engineer To Order) solution is an SAP system for medium-sized specialized mechanical engineering, plant engineering, and construction firms. It was developed on the basis of the 'EASY –

Ready-to-Work' solution and is thus a pre-configured, fully deployable SAP system with industry-typical processes of logistics, accounting and engineering to order. This ETO solution combines the experience and know-how of specialized mechanical engineering, plant engineering, and construction in one SAP industry-specific component.

The necessary customizing expenses are restricted essentially to the corporation-specific requirements. The high quality, cost effective and rapid implementation of SAP is ensured with the SAP EASY ETO solution for medium-sized specialized mechanical and plant engineering firms with its:

- rapid project startup
- project focus on industry-relevant business processes
- preliminary prototyping
- shorter and more effective learning curves for the project team and end users



- industry-oriented user training
- industry-oriented documentation

The core process describes the process of a production order in the field of new plant transactions. This process starts with processing of quotations or orders, including configuration, and ends with the shipment or the product being put into operation at the customer site, as well as the concluding billing. The SAP project system ensures ongoing transparency in terms of costs and schedules throughout the entire life span of this type of customer project. It is also possible to use this solution to implement service orders and spare parts orders.

The SAP solution for special medium-sized machines and plant engineering supported by IBM is designed to guarantee the use of cutting-edge technologies and applications, both today and in the future.

EASYsecure

EASYsecure is the fast and methodical way to implement and administer the SAP user authorizations concept.

The controlled and authorized access to data of the SAP R/3 system is an important prerequisite for meeting business and data protection legislation requirements. This access becomes even more significant, as SAP R/3 is an integrative and open system with a uniform basis of data.

The SAP user authorizations concept, which is frequently regarded by experts and users as complex and difficult to implement, is intended to meet the high demands of data access.

This where **EASYsecure** comes in, providing **predefined authorization modules** that can be individually combined to form **company-specific roles**. EASYsecure also includes a large number of target group-specific tools that greatly simplify the implementation, administration and handling of the SAP user authorizations concept.

The basic idea

EASYsecure is a multi-level structuring of all SAP R/3 modules clearly delineated and practical units, so-called profile modules. These profile modules, whose definition is the generalized result of a large number of IBM SAP projects, can be further customized on a company-specific basis at any time. It is a matter of course that the attributes of the profile modules are matched to the organizational units of the company. With a focus on processes, the profile modules are merged into workstations (roles) that are then assigned to the SAP users. The possibility to adapt this combination to current requirements ensures that the customer has a high degree of flexibility.

EASYsecure uses the techniques of the SAP R/3 profile generator and comes into the project with a reliable template. The consultant is thus able to apply a comprehensively

tested method for successful project implementation.

The methodical implementation is supported by a proven project plan that regulates all the important steps and scheduling in relation to the overall project.

Target-group-specific training material and prepared protocols and request forms ensure a transparent and comprehensible user authorizations concept from the first access to SAP onwards.

5.7.7 IBM SAP industry solutions for power supply companies

Increasing competitive pressure in the utilities industry following the trend of legislative liberalization is demanding a new way of thinking in organizational structures and business processes. As this develops, information concerning customers, technical plants and costs must increasingly become the focal point so that it is possible to react to market requirements quickly. Years of experience in SAP implementation consulting for power and utilities companies and the necessity for a response to changing competitive conditions have prompted IBM to provide its customers with an appropriate tool. This is a system that has been predefined especially for small to medium-sized power and utilities companies (**Pro-Utilities**). In it, the core processes that are typical to the industry have already been implemented, including the private connection procedure, fault man-

agement, network extension and the company's auxiliary processes.

The basis is formed by the **“Public Utilities Model,”** as it is known, which contains the following range of functions:

- financial and fixed asset accounting
- controlling (cost center accounting), project systems
- materials management (purchasing, stock control)
- maintenance and repairs/service management

In this way, Pro-Utilities supports the complete process of the customer-specific implementation and operation using complete conceptual designs and tools. Reducing the customizing outlay in accordance with corporation-specific requirements, ensures that the SAP introduction will be high in quality, rapid and above all, cost-effective. The preset system is currently being expanded with the addition of the IS-U module.

5.8 Services for the Transition from Existing Systems

Every company which introduces SAP R/3 must transfer existing application data into the new system. Furthermore, it may be necessary to set up interfaces between existing and new applications in order to guarantee the data exchange. Data transfers and data exchanges – which are frequently underestimated during project planning – can only be executed efficiently and cost-effectively by using a high performance tool.

MID@S – Migration and Data Exchange

Data transmission and continuous data exchange are critical factors in the success and the cost of a project for implementing new application software and in the parallel operation of different systems.

MID@S ensures fast, efficient and cost-effective **data migration** from various applications to SAP R/3. Developed from the MIDAS migration tool for AS/400, in addition to the known interfaces between AS/400 applications and SAP R/3, MID@S also includes the link from SQL-compatible databases such as Oracle and DB2, processing of flat files and standard interfaces to other SAP R/3 systems. For data to be transferred, the data of the source system must be edited and linked with the fields of the target system (mapping).

With the simultaneous depiction of information on the source and target system, the MID@S migration tool offers the user a convenient and easy-to-use interface for mapping. In addition, migration rules can also be defined on a field level which describe the conversion of the field contents.

The mapping table controls the data export in the old system and the data import into SAP R/3 during data transfers. At the same time, it automatically documents the data transfer.

In addition to the data import into SAP R/3 systems using various import technologies

(BAPI, direct input etc.), the link to the SAP Business Information Warehouse has already been fully integrated. The use of pre-configured and tested interface programs enables the set-up and administration of permanent interfaces which can then be quickly configured without error, monitored and extended for new release updates.

With MID@S, IT Services & Solutions has developed an innovative tool which provides a cost effective method for one-off data transfer and continuous data exchange. To date MID@S has proven itself in many projects for the migration of master data and movement data.

From the availability of SAP R/3 on IBM AS/400 and as a database server on S/390, there had been an even higher demand for the migration of UNIX or NT-based SAP R/3 systems to AS/400 or database porting to DB2 for S/390.

For these users, IBM offers the **CROSS service**. The main component of this is the optimized conversion of the SAP R/3 system environment to IBM AS/400 or the database crossload into the S/390 system. Using its wealth of experience in the SAP R/3 and AS/400 environment, IBM is able to ensure that the conversion is carried out as a total solution and the aforementioned advantages can be enjoyed with similar functionality and application environments. Of course, typical changeovers are also possible within the

project such as TCP/IP integration, print-outs, data backup and codepage conversion.

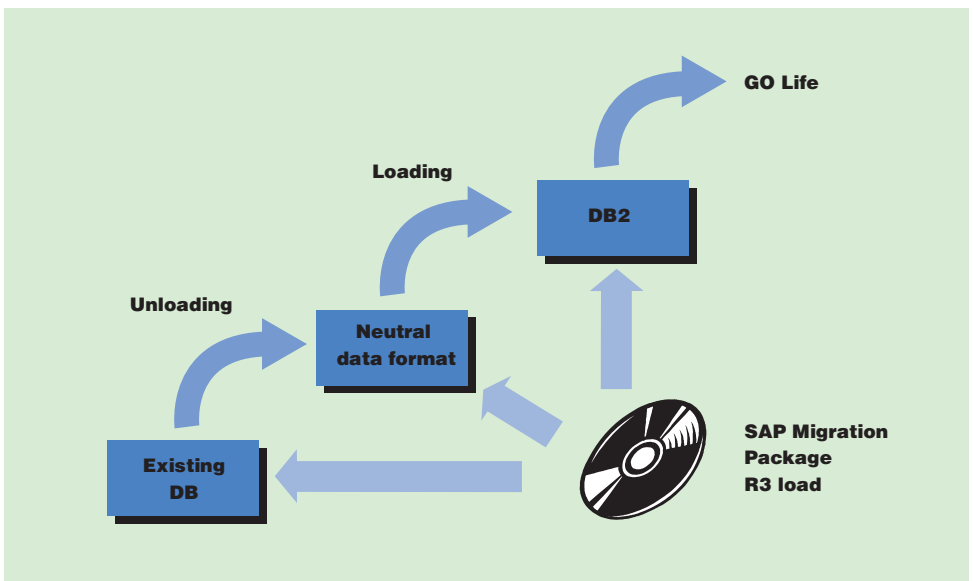
IBM's experience also comes to bear in the integration of the host in the SAP R/3 client/server model with the S/390 system as the database server. The central Crossload tool is the program reload of the SAP base. In the database and operating system based version it is used for exporting complete SAP R/3 databases into a non-platform based data format and the subsequent loading into a pre-installed SAP R/3 system.

The complexity of the Crossload procedure – a procedure that combines the application of tools, manual work steps and, at least in part, the performance of highly comprehensive and complex tailoring in the SAP environ-

ment – requires the in-depth knowledge of experts and extensive experience. With **CROSSLOAD**, IBM offers a complete service which can be used for the swift and reliable changeover of the total SAP R/3 platform to IBM AS/400 or for porting existing SAP R/3 databases into the S/390 system. Naturally, CROSSLOAD can also be used for changing the database within the same platform.

SAP R/2 customers who wish to **migrate from SAP R/2 to SAP R/3** or mySAP.com are supported by SAP and IBM in the migration. SAP also provides migration tools for every release of SAP R/3 up to release 4.6C. The strategy selected for the migration depends upon the release level of the SAP R/2, the modules installed, the proportion of internal design developments and – by no

SAP R/3 Database migration



means least – the volume of data. IBM offers services that complement each other to form a complete package.

In essence, this type of migration consists of two stages:

- the actual introduction of the SAP R/3 and, at the same time,
- the conversion and transfer of the data from SAP R/2 to SAP R/3.

These tasks can be carried out by two project teams:

- SAP R/3 implementation team
- IBM Migration Factory Team.

The **Migration Factory** is a special service offered by IBM for transferring data from SAP R/2 to SAP R/3 or mySAP.com. The rules for converting this data are jointly decided in advance by the IBM Migration Factory Team and the SAP R/3 implementation team. The Migration Factory assumes responsibility for the quality of the migrated data based on these rules. Depending on the customer's situation, it can also provide the necessary hardware and software (e.g. FTP). The data conversion is then carried out on a separate system; any potential hardware enhancements required on the customer side are thus ruled out, as are computer overloads during day-to-day operation.

The following benefits are derived from this operating procedure for a migration project:

- quality resulting from proficiency and security in the result
- scheduling is shorter and more precise
- hardware enhancements and additional software costs can be eliminated
- lower development costs for additional transfer programs
- training costs for migration tools are eliminated
- load reduction for the customer's computer and reduction of interference with productive SAP R/2 operation.

Customers who wish to replace their traditional legacy systems with SAP R/3 are also supported by IBM. Together with INNOTECH Solution AG, our business partner for migration, we are able to provide specialist teams. The **iSMI** tool developed by INNOTECH – a tool which ensures the very highest quality for the old data that are transferred – is used.

The large number of projects completed over the years is proof of the high levels of customer satisfaction. For the customer, the professional methods used, together with iSMI, ensure:

- reductions in time and costs during the migration of old data
- reduction of maintenance expenses in the new system
- optimization of the migration workflow management
- a significant improvement in data quality achieved by a preliminary data comparison of different sources
- integration of non-transferable databases mapped in iSMI

- prevention of any loss of information
- archiving of old data
- information hub for the exchange of data from applications that are not replaced (any-to-any) and SAP R/3.

Through additional function modules and interfacing to IBM's MQSeries message server product, iSMI presents the perfect scenario for the data exchange between a wide range of applications. Furthermore, it enables a data warehouse to be set up and operated using DB2.

5.9 IBM and SAP Beta Test Sites (BTS)

The BTS – a team of 40 employees – was set up in 1995 and is the main IBM office that installs, tests and assesses SAP First Customer Shipments (FCS) and beta versions of SAP worldwide. It has also been awarded the **SAP partner R/3 Customer Competence Center (CCC) LOGO certificate** and supports all internal SAP projects of IBM with First Level Support (FLS), developments as well as numerous training courses and special tests. BTS does this by providing system environments for SAP.



e-business places additional demands on an SAP back-end system. In addition to SAP CRM, the BTS performs integration test for front end systems in the CRM and Procurement

environment (Siebel, Ariba or I2) based on SAP.

The benefits for you:

During initial installation, testing and assessment of all new SAP versions as well as the integration of front-end systems, you are assured of support from a central team with extensive and up-to-date expertise. Through the transfer of information in your projects, you benefit from our close contact with SAP AG. Quick availability and the focus on core issues ensure the functionality of your most important business processes.

Solutions:

Using their extensive know-how, the BTS offers services and solutions in project management and in projects in the SAP environment in the areas of:

- e-procurement
 - Ariba Buyer SAP R/3 Integration
- e-business
 - SAP CRM Internet Sales
 - Internet Product Configuration and Pricing (Internet Pricing and Configurator, IPC)
 - WebSphere/SAP Integration
 - Lotus – SAP – e-business Integration
- Tests
 - Structure of the test concept
 - Providing system environments
 - Performance of complete tests
 - CATT Workshops

- Round Table Discussions/Workshops
 - BTS offers Round Table Discussions and workshops covering individual topics (e.g. IBM-internal use of SAP). These are useful for exchanging information and experience with the aim of designing the best solution for our customer.
- SAP Base Support
 - Installation and system administration on AIX and OS/390
 - DB Migration
 - SAP release upgrade with minimized downtime
- provision of
 - System environments for SAP R/3, APO, CRM, IPC, BW, Lotus Notes databases,
 - Info DB for tests, development, training and as SandBox
- First Level Support (FLS) & Customer Competence Center (CCC)
 - Consulting for setting up a CCC
- Special fields (e.g. APO, BW, CRM, CATT)

required today for day-to-day business processes, as well as estimating and planning future requirements for applications mean rising costs for qualified staff for a company, and these are difficult to find. New challenges in the business environment must be encountered with the implementation of continuous improvements and expansion that meet the demand for increased functionality of applications and help to ensure the competitiveness of the company. Without these extensions, a company cannot survive in the world of e-business. These necessities can take even the most flexible IT solution to its limits.

With **IBM Application Management Services**, you can draw the greatest possible benefit from your application investments and concentrate of expansion of your market position as an e-business company. IBM Global Services can work with you to develop the continuous management of your applications and continuous improvement of your portfolio. The range of services offered provides you with solutions for ERP (Enterprise Resource Planning), e-business, engineering applications and individual host processes. You as customer decide on the areas in which you wish to benefit from our skill.

The AMS offer describes standard offer components

On the basis of market surveys, 15 AMS Support Features have been developed. The features are divided into three support groups. Customers can choose any combination of features.

Application Management Services (AMS)

IBM provides professional service for optimization of your application development and support.

Keep pace with the evolving environments of today

The deployment of an IT application in a complex environment represents a great challenge. Preserving the high service levels

Experienced specialists support you where required

Our experienced team of experts can support you in the management of your application resources by providing modern tools and proven methods. With our assistance, you can select the most suitable solution for your company with continuous support or periodic support services. This gives you the possibility to react quickly and flexibly to changes in your business environment.

Benefits through professionalism

As early as the design phase for your applications, our specialists work with you on optimizing the later operation. With professional procedures and methods, we ensure smooth transitions – from design through development phase to operation and maintenance. Our standards provide the customer with consistent, high levels of efficiency.

Improved application support and rapid implementation of new functionality

The IBM specialists can help you to meet the growing requirements with regard to end-user satisfaction, continuous IT and infrastructure management, and new functionality.

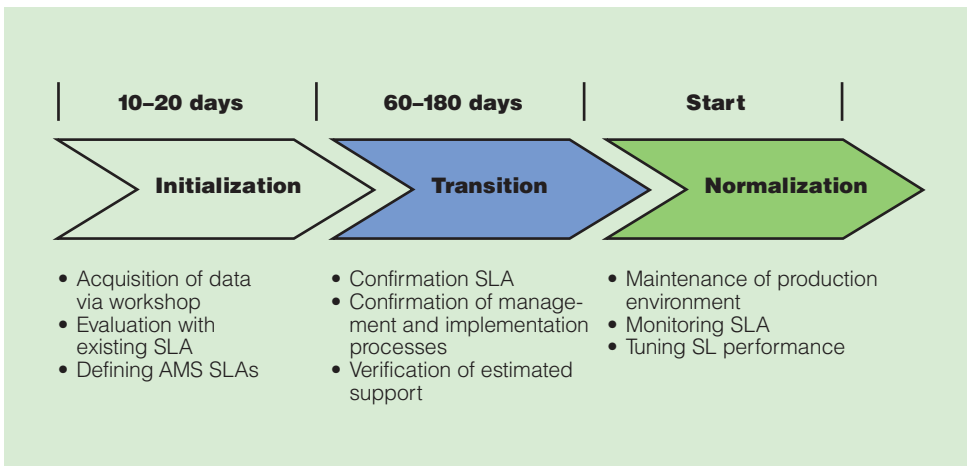
Strategic investments with measurable benefits

We apply cost-optimized and proven procedures that support you in achieving your company objectives. So that you achieve the results you expect during the entire life cycle of your system, we work with your employees to support them in understanding the aspects of performance and development.

Proven business relationships and our extensive experience

The co-operation between IBM and SAP in the development of individual solutions pro-

Implementation of AMS



vides IBM with comprehensive experience in ERP implementations worldwide, for customers as well as for IBM's own requirement. A continuous strategic investment in your ERP solution can deliver optimum performance and this business advantages. Make use of the skilled support of IBM Global Services for the successful management of your ERP environment, today and in future.

7 Outsourcing Services

IBM Global Services is your SAP outsourcing partner, with the knowledge, experience, IT technology, worldwide connections and comprehensive technical infrastructure to meet all the requirements in the SAP environment for your company. IBM Global Services was **qualified by SAP as an outsourcing partner** in 1999. We can offer you all of the SAP services described in this brochure in one outsourcing contract. In doing so, IBM Global Services takes on the responsibility for operation and assumes the highest possible commitment level vis-à-vis the customer. This can also incorporate taking over employees and assets.

The scope of **SAP Outsourcing Services** takes its orientation from your requirements and is worked out on an individual basis. This means that complete or selective outsourcing of your information technology are possible.

7.1 SAP Operation Services (Application Hosting)

The **SAP Operation Services** comprise all tasks that have to be performed within the framework of computer center operation. These are systems management disciplines such as

- Capacity management
 - Planning and materials planning of the physical and logical system resources
 - Analysis of utilization
- Performance management
 - Monitoring the system characteristics and system throughput
 - Reporting and initiation of adjustments in the case of deviations
- Problem management
 - Structured processing of problems and project accompaniment
 - Analyses for preventative measures
- Change management
 - Controlled changes to the overall system
 - Minimization of disruptions to operation.

The operation of your SAP application for 24 hours on 365 days a year on a wide variety of hardware and operating system platforms in IBM computing centers, or also on your premises, with the highest possible security standards. In Germany, IBM Global Services now operates more 50 000 SAP workstations for over 100 customers.

7.1.1 SAP Application Management Services (AMS)

AMS is the management and performance of all tasks for one or all of the following activities for customers:

- Architecture planning
- Application development
- Maintenance and small/large expansions
- Service Level Management
- User administration (access control and configuration)
- 2nd level user support.

AMS can comprise the management of all applications in your company or only a selection thereof. Today, IBM Global Services provides support for more than 23 000 SAP R/3 users at over 45 customers in Germany within the framework of AMS Services.

7.1.2 NetWorkStation Management Services

As a reaction to sophisticated and complex requirements in the end-user environment, we have developed for our customers new, worldwide service concept. With **NetWork-Station Management (NWS)**, we offer you a flexible solution for your PC/workstation and LAN environment that is individually geared to your requirements:

- Selection and procurement of hardware and software
- Setup of user workstations
- Network management
- Software distribution
- User support for hardware and software problems

- Training, instruction of users
- Inventory and license management
- Data protection and data security
- Systems management.

This service is independent of the complexity of your IT environment and the size of your company. Products of all manufacturers are integrated.

7.1.3 Operation of Networks (WAN)

The **Network Outsourcing** offering of IBM Global Services provides you with solutions related to the operation, planning, design, as well as integration and installation of company networks. This also includes the solutions in the areas of Intranet and Internet, with the required security mechanisms, mail and news systems as well as hosting platforms.

- Network service: Communication across worldwide IBM networks with business partners in heterogeneous hardware and software environments (Electronic Mail, Electronic Data Interchange [EDI], etc.)
- Takeover of customer networks: design, implementation and operation of tailored customer networks for voice, data, video
- Internet/Intranet Services: complete solutions for users and information providers in the Internet/Intranet with a “state of the art” infrastructure
- User support / problem management.

7.2 Application Service Providing (ASP)

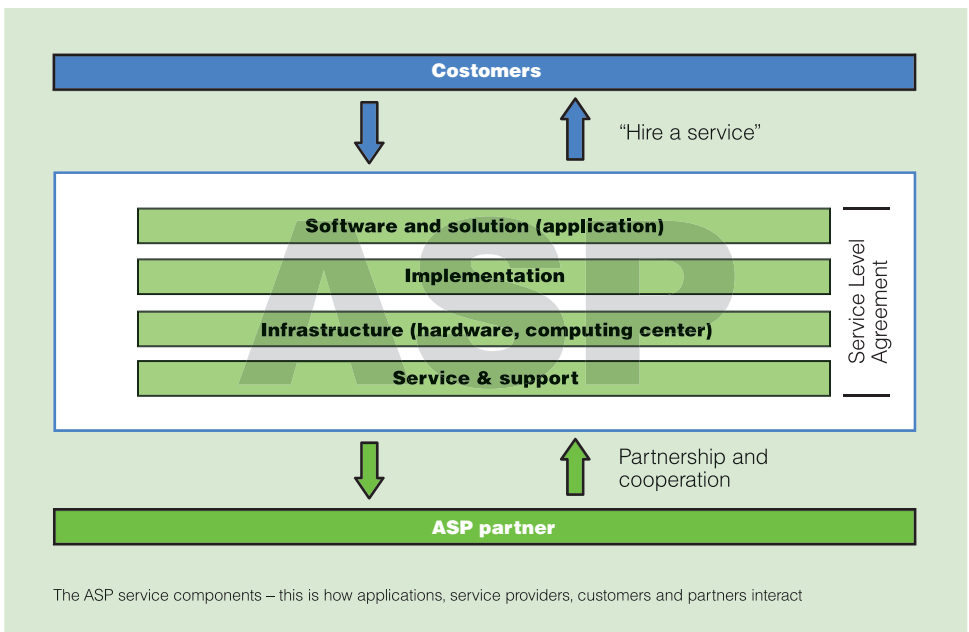
7.2.1 The ASP model

ASP represents a new alternative to the possibilities available to date on the market for the provision of software solutions for companies. The ASP model is characterized by the following points:

- The customer concludes one single rental contract with the provider. This contains all the required service components for the use of the ASP solution.
- An ASP solution comprises the services listed below, which as a rule are provided by ASP itself. The ASP provide individual components through partners (subcontractors), who then contribute the services defined here as commissioned by ASP – and with their responsibility. The overall responsibility remains with ASP.

IBM has developed the first ASP solutions on the basis of mySAP.com components. In doing so, IBM relies on consistent exploitation of synergy effects in the technical environment (shared use of a server environment) and from the point of view of the application (use of a standard development by a large number of customers), while at the same time taking account of security standards (access to application and data, data backup, etc.). In order to achieve the greatest possible number of synergies, the client concept of mySAP.com is consistently applied. This procedure produces advantages for customers in the areas of “functionality of the solution” and “price for the application”.

The following services are offered within the framework of an ASP solution:



Software

Provision of the license on the basis of rent and solution: completed applications provided in fully configured condition that only need to be supplemented by customized data (customization).

Implementation

Within the framework of the implementation of the IBM ASP solution, IBM performs the following services:

- Setup of the technical environment in the IBM computing center
- Setup of the customer environment from the business application view.

Implementation from the business application view also includes training of the end users as well as provision of an application manual.

Infrastructure and access to the IBM ASP solution

The IBM computing center provides the required technical infrastructure. This includes not only the various mySAP.com systems (development and production system) but also the required hardware (database and application server, Internet Transaction Server, Proxy Server) and the system software (operating systems, database, software for data backup).

Standard access to the IBM ASP solution is across the Internet. For this, all that the ASP customer requires is the end user PC, a Web browser – e.g. Internet Explorer or Netscape Explorer – as well as access to the Internet. The technical requirements for the end user

workstation are defined in the service description for the ASP model.

Continuous service and support

Within the framework of continuous service and support, IBM performs the following services:

- User Help Desk (First and Second Level Support for replies to questions as well as solution of problems)
- Maintenance and update work, both on the technical infrastructure in the IBM computing center of and in the application area
- Periodical print services.

7.2.2 The IBM HR ASP solution for Human Resources Management

The **IBM HR ASP** solution covers tasks in the area of payroll accounting (wages and salaries) for German companies and has been developed on the basis of mySAP.com by IBM. By parametrizing salary and wage tables, a wide variety of rate types and rate areas are mapped, so that the majority of wage and salary rates that occur in a company can be represented.

The IBM HR ASP solution calculates the net salaries and wages. To achieve this, all the tax and social security contributions laid down by law for the accounting periods are determined. All of these tasks, as well as the control of follow-on settlement activities, are performed according to schedule by IBM.

The package of functions also includes comprehensive output management, which consists of printing and dispatching not only the

salary and wage slips but also the required legal forms such as employment tax notifications (e.g. on floppy disk).

The IBM HR ASP solution contains the following main functions of Human Resources Management:

- Personnel Administration
- Personnel Time Management
- Payroll Accounting, Germany (gross/net)
- Travel Management
- Statutory Reporting (tax/social security).

7.2.3 The IBM BBP ASP solution for procurement of C materials

The **BBP ASP** solution from IBM simplifies the purchasing of C materials in the area of materials management and is based on release 2.0C of **SAP B2B Procurement**. This enables optimization of the essential purchasing processes in the company itself as well as of communication and processes involving its environment (e.g. vendors). The complete procurement process from creation of the requirement coverage request to invoicing is mapped on an easy-to-operate Web interface.

SAP BBP shifts operative purchasing at the customer from the purchasing department to the workstation of the employee. The employees select the material to be obtained from a catalog provided by IBM. As an option, customers can incorporate other catalogs of their own. The essential functions of the purchasing process are integrated in the IBM BBP

ASP model:

- Setting up of shopping baskets
- Status query
- Confirmation of goods arrival
- Confirmation of billing

Additional tools for user administration and editing work items are provided. The required authorizations for different user groups have already been created in the mySAP.com role concept and are available when user master data sets are to be created. Numerous other option services are possible.

In the standard implementation, the BBP ASP solution is deployed in such a way that purchasing documents are posted locally in the BBP system. Access to the BBP system by the customer is by means of a reverse proxy server. In an alternative scenario, if required, the complete materials management can be mapped in an SAP R/3 system (3.1H or higher). All materials management documents (order, goods receipt, bill) are then located in the ERP system.

IBM Training Packages for SAP Instruction

IBM offers an extensive, well-rounded **training program** for SAP R/3. In the end, every implementation of integrated application software such as SAP R/3 is a customer-specific solution since it must be adapted to the organization of the respective company. It is for

this reason that IBM offers both SAP R/3 standard training seminars and training seminars especially tailored to your organizational structure at your offices. We analyze the knowledge requirements for the various user groups in the SAP environment and develop the corresponding training plans. The IBM range of education and training services for SAP R/3 comprises the following focal points:

- SAP R/3 Training for Project Teams and Project Managers
- SAP R/3 training for users
- SAP R/3 training for base administration
- Technology-based training solutions for SAP R/3

8.1 SAP R/3 Training for project teams and project managers

The outstanding functionality of SAP R/3 can only be fully utilized if the professionals within the company have completely mastered all of the potentials for tailoring and use. It is here that the IBM service comes into its own: It offers professional SAP R/3 training for your project teams and project managers, so that you can provide an ideally tailor-made and configured application system for your users in the shortest possible time.

IBM's three-stage training model can offer you the following using the latest multimedia teaching methods:

- a project-based introduction to SAP R/3

- workshops customized to your business processes and
 - task/role-based advanced seminars.
- All three levels are based on the principle of basing the course contents on the relevant processes.

8.2 SAP R/3 Training for Users

The introduction of SAP R/3 requires timely and thorough training for both employees and management personnel. For just this reason, IBM has developed a special training model that can be flexibly tailored to different user roles. We provide you with the technical and logistical solution for training your users under uniform management. Integrated within the IBM implementation method known as Method BLUE, we have developed a modular procedure that covers all important aspects of user training:

- analysis, planning, execution, even logistics, if requested
- the basics of using a PC
- SAP R/3 basic knowledge
- individual, process-oriented instruction, amount of detail can be adapted to meet needs.

The requirements for the success and acceptance of the training course also include the prompt and supervised incorporation of users in the implementation project.

Range of education and training programs

	Project team	User/Key user
Made-to-measure training courses*		
Standard training courses*		
Technology-supported learning		
CBT, WBT (web-based training)		
Tele-cooperative learning (e.g. LLS)		
Train the trainer (technical and didactic)		
Training logistics		
Management of training project		
Setting up a Helpdesk		
Skill management and "maintenance"		
Preparation for SAP certification		
Use of a database for training mat.		

* at customer's or on IBM premises

recommended required

8.3 SAP R/3 Training for base administration

A high-quality training course in the SAP R/3 base area is a requirement for its successful implementation and application. IBM offers a compact, five-tier basic training course for SAP R/3 computing center operation on all possible hardware platforms. It also includes:

- OS/390, OS/400, AIX/UNIX, Windows NT operating systems
- setup and administration of IBM's DB2 database or databases supplied by other manufacturers
- connectivity and networks (TCP/IP)
- SAP R/3 base overview

Participants are given an introduction into the architecture of SAP R/3, its interfaces

and its system management. This stage covers all hardware platforms.

System-based R/3 training: Participants are introduced to the special features of SAP R/3 implementation and administration for the respective platform.

Supplements for individual operations based on a special SAP R/3 configuration can be made at any time.

8.4 Technology-based training solutions for SAP R/3

The IBM training package for the SAP R/3 environment is complemented by technology-based training solutions. With our **Distributed Learning Services division**, we are able to provide you with a complete learning envi-

ronment: from classic multimedia **Computer Based Training (CBT)** on CD-ROM combined with IBM training programs and workshops, up to corporation-specific advanced courses via intranet. The result is an overall training program that provides you with information necessary for the introduction of SAP R/3

- goal-oriented and practical
- quick and cost-effective
- does not entail traveling, hotel or hospital-ity expenses

in accordance with your specific training needs

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