Summary

Enterprise resource planning software (ERP) integrates all departments and functions within a company into a single system that satisfy the department’s needs. Departments such as human resources to financing to the warehouse have their own needs in software but ERP is developed to satisfy them all. A successful ERP regularly updates information that can be accessed by the organization and consumer alike at real time. The term ERP was used in the 1990’s by the Gartner Group. The acronym reflects the evolution of application integration beyond manufacturing. During the panic of 2000’s Y2K, many companies replace their systems with ERP. ERP started in automating back office functions, front office functions and e-business systems. Some of the most widely used ERP systems are sold by SAP and Oracle.

SAP

SAP was founded in 1972 by five former IBM Germany employees: Dietmar Hopp, Klaus Tschira, Hans-Werner Hector, Hasso Plattner, and Claus Wellenreuther. Originally working with IBM, these men were tasked with migrating Xerox to IBM thus creating an enterprise wide software. They left IBM when the company decided there was no need for the software but instead of scrapping it, they decided to leave IBM to create a new company based on such software.

Their first client was Imperial Chemical Industries in Ostringen, Germany. They developed mainframe programs for payroll and accounting. Learning from their experiences with IBM they stored the information locally rather than overnight with punch cards. Meaning the
software acted as a real-time system. It eventually became a stand-alone system that was offered to interested parties.

The first commercial product, created in 1973, by the starting SAP was SAP R/1, the R standing for real time data processing. It had a one tier architecture with three layers Presentation, Application and Database installed in one server. Its predecessor was launched three years later, SAP R/2, it expanded the capabilities of the R/1 with material management and product planning. Also included with IBM’s database and dialog-oriented business application. Unlike the R/1 it had a two tier architecture also made up in the same three layers Presentation, Application and Database but installed in two separate servers.

SAP R/3 is the main ERP software systems that is developed by SAP. It is a real time three-tier client /server architecture composed three layers of software the graphical user interface (GUI), the application layer, and the database layer. The architecture is compatible with various operating systems and platforms such as Microsoft windows and UNIX. Sap R/3 is arranged in distinct functional modules. The most wildly used modules are product planning (PP), material management (MM), sales and distribution (SD), financial Accounting and Controlling (FI, CO), and human resources (HR). Each of the modules works independent of the other but is linked together. SAP R/3 has also become an industry standard although customizing the modules or any feature of the system is difficult.
Another SAP system is mySAP ERP. This system is meant for larger companies since the implementation is very expensive. Just like SAP R/3, SAP ERP is designed to integrate all aspects of the company into a single computer to serve all the needs of the company. The key aspect is the SAP netWeaver platform. It uses web services to increase business flexibility through .NET and J2EE. MySap’s advantages are workforce mobility through mobile infrastructure, transparency through Business Intelligence framework, improved workforce efficiency and productivity and faster turnaround and better decision making due to faster access to information. The use of this system means the company is ready to extend the infrastructure to include web enable services and hub based integration of SAP.

Oracle

Oracle is the rival to that of SAP. Oracle started as Software Development Labs in 1977 founded by Larry Ellison, Bob Miner and Ed Oates. Its primary business is database products. Its relational database was the first to support SQL becoming an industrial standard. In, 1986 Oracle went into a technology boom which transformed the company of 35 employees to a global powerhouse.
A database is a collection of data treated as a unit. The purpose is to store and retrieve information. It runs off a client/server architecture. Meaning a user calls information and the server takes the request and sends the information back to the user. All of it is accomplish while delivering high performance. Oracle database is the first database designed for enterprise grid computing, meant to be flexible and cost effective in managing information and applications. This system creates an industry standard with modular storage and servers. The architecture allows each new system to be provisioned with a pool of components.

Grid computing is an IT architecture that produces lower cost information systems. Independent hardware/software components are connect on demand for the changing needs of business. The style of grid computing balances flexible independent resource control as well as resource management. It separates itself from other styles in with virtualization and provisioning. In virtualization, individual resources are pooled together by type then made to available to the consumer. With provisioning, when the consumer requests resources a specific resource is identified then allocated. The resources include infrastructure, application and information.

The infrastructure grid resources include hardware resources such as storage, processors, and memory and software designed to manage hardware. In Oracle, virtualization enables a single data base to run multiple nodes in a grid making it uniquely flexible in the ability to provision workload across machines because its database technology does not require data to be partitioned and distributed along with work. The storage virtualization provides a virtual layer between database and storage so that multiple disks can be treated as a single group. Which can
be dynamically added or removed. It pools together multiple servers and disks and allocates them to multiple purposes.

The application grid are the encodings of business logic and process flow within application software. Oracle can publish and consume web services using tools such as SQL row sources. It also can monitor and manage those web services tracking end-to-end performances and analysis problems that may occur.

The information grid includes all the data in the enterprise and all metadata required to make that data meaning full. It provides a way for information to be joined with related information to maximize the value form the connection. The database provides an optimal way to access information through its implementation of OLAP cubes, standard XML structures, geographical special data and unlimited size file management. Oracle series of enterprise data hub products giving real-time synchronization of information so that correct sources of information are given. Oracle also provides a well formed schema based on years of experience.

Oracle uses a client/server architecture meaning the database is separated into two parts the client, the front end, and the server, the back end. The client is a database application that requests an operation to be done on the database server. The server runs Oracle software and
SOFTWARE ARCHITECTURES

handles functions required for concurrent, shared data access. This is encompassed by a multitier architecture which is comprised of the client starts and operation. Then one or more application perform parts of the operation. The application server provides access to the data for the client and preforms the query processing removing the load from the database server, where it finally is sent back to the client.

The structure of Oracle is based on physical and logical database structures. The physical structures include datafiles, redo log files and control files. Every Oracle database has one or more physical datafiles which contain all the database data. A Datafile can only be associated with one database. Certain characteristics can be set to element them automatically extend when the database runs out of space. One or more datafiles form a logical unit called a tablespace. The data in a datafile is read when need during normal database operations and stored in memory. Control files contain entries that specify the physical structure of the database such as the database name, its datafile and redo log files names and locations as well as a time stamp of a database creation. Oracle can multiplex the control file meaning maintaining a number of identical control file copies to protect against failure involving the control file. Redo log files are collectively known as a redo log for the database. It is comprised of changes made to the data. In the event that modified data cannot be written into the datafiles the changes are not lost.

* Archived Redo Logs present only after turning on log archiving (ARCHIVELOG mode)
SOFTWARE ARCHITECTURES

The logical database structure includes data blocks, extents and segments. Data in Oracle is stored into a data block. One block corresponds to a specific number of bytes of physical database space on the disk. Extends is the next level of space which is a specific number of contiguous data blocks used to store information. Segments are above extends meaning it contains a seed of extends allocated for a certain logical structure.

Features of Oracle include concurrency, read consistency, a locking mechanism, quiesce database, real application clusters and portability. Concurrency, which happens when the same data is access by multiple users, is a primary concern in a multiuser database. Oracle resolves this issue by using various types of clocks and a multi-version consistency model based on the concept of a transaction. Oracle’s read consistency guarantees the state of data seen by a statement is consistent with the time that the data was accessed. It ensures that readers do not wait for writers of data and writer do not wait for readers of the same data. To manage this Oracle creates a read-consistent set of data when the table is queried and simultaneously updated. When the update occurs the original data is overridden unless the transaction is uncommitted meaning the data is held later and the original data is intact. By default, Oracle queried data is consistent with respect to the time it was accessed.

The locking mechanism is used by Oracle to prevent data from being access by multiple users at the same time. When updating information, the data server hold that information in a lock and until the update is either submitted or committed no one else can make changes to the locked information. Oracles lock manager maintains two types of row locks exclusive locks and share locks. Exclusive locks can be places on a resource such as a table while many share locks can be places on a single table but neither can create the lock on the table if one already locks a table. There are occasions where isolation is need for the database administrators one way is to put the database in restricted mode but in most cases it is difficult so Oracle uses a quiesced state that doesn’t disrupt users. In this state administrators can safely perform actions whose executions would require isolation from concurrent non-DBA users.

Real Application Clusters comprises several Oracle instances running on multiple clustered computers. It uses cluster software to access a shared database residing on a shared disk. Combining processing power of interconnected computers, RAC provides system redundancy, near linear scalability and high availability. Oracle provide portability a cross major platforms and ensure applications run without modifications after changing. The reason being that Oracle code is identical across platforms.

As a company get larger manageability comes into effect where some have difficulty maintaining and updating software and databases. Oracle provides a solution to that problem. Its database provides a high degree of self-management making the task of the database administrators easier and allow them to focus on more important parts of the database. Oracles self-managing database include automatic undo management, dynamic memory management, Oracle-managed files and Recover Manager. With the Oracle Enterprise Manager it provides integrated solutions for centrally managing the systems environment. Oracle also has an automatic storage management that simplifies the layout of the datafiles, control files and log files. Database files are distributed automatically across available disks when database storage is rebalanced during a storage configuration change. The database resource manager controls the distribution of resources among sessions by controlling the execution schedule in the database. Resources can then be distributed for based on plan directives.
Along with Database systems Oracle also tired their hand in ERP. Oracle ERP is the core software of Oracle E-Business suite. It’s based on ERP with the system extending to the consumer. Oracle ERP integrates Customer Relationship Management (CRM), Supply Chain Management (SCM) and Business Intelligence (BI).

Oracle CRM a set of management systems that give you information about sales, services and marketing. The sales capabilities are what you would expect in sales with calendars and task managers. But the system’s ability to forecast is a functionality that has a value and creates insight to future sales. On its marketing side, Oracle acquired Market2Lead along with its tools that give up to date information about the market. CRM customer service is flexible assigning route services to designated agents. Other unique features of CRM is its mobile feature which allows iPhone and IPad to access contact informations as well as note taking. The forecast also operates on mobile devices.
Oracle BI deals with the collection of information within the company and analysis. Features of BI include an interactive dash board. It allows users to access and enter various information about themselves and their fellow employees about what they are currently working on or open a strategies for the future company endeavors. The Ad hoc Analysis and Interactive reporting provides ad hoc queries and analysis capabilities. BI can create new analysis in the dashboard pages and offers logical views of metrics, hierarchies and calculations to express concepts. Like the previous, BI also has mobile analysis through smartphones and tablets. Enterprise reporting allows creation of strongly formatted templates, reports and documents. It’s efficient and scalable reporting solutions for complex environments and support a number of sources. It can also be deployed as a stand along product. BI contains a real-time alert engine that notifies stakeholders and trigger workflow events meaning representatives and managers receive information and alerts at the right time. The openness of BI allows the use of desktop tools like Microsoft office and combine it with Oracles Hyperion systems. Real-time interactive map views are possible and show information such as highways, air routes and post addresses.
Oracle Supply Chain Management (Oracle SCM) is a family of application of applications integrates and automates all key supply chain process, from design, planning and procurement to information driven value chains. It helps managers optimize the tradeoff between stocks and inventories versus its ability to be delivered at a good price with a reasonable delivery date. SCM enables to lead the process of supply chains in real-time maximizing value in the chain and customer satisfaction. The system can predict market requirements in response to the market and match the company’s operations to the global network. Oracle SCM is a system that Oracle offers solutions in product development, demand management, sales and operation planning, transportation management, and supply management.
Comparison of SAP and Oracle

SAP and Oracle have been innovators in the field of ERP so it’s no surprise they are each other’s rival. The focus of each company is different with SAP focusing on ERP and Oracle changing from relation database developer to complex enterprise application provider with some stake in the hardware market but in the ERP market they butt heads often. They had even gone to court with one another. Oracle sued SAP for copyright infringement when SAP downloaded copyright documents from Oracle. Oracle had won but did not receive its estimated loss of $881 million to $2.69 billion but instead SAP paid Oracle a remittitur of $272 million. Which goes to show a little of the sparks between the two companies.

In market strategies, SAP looks over time with market surveys and analyzing needs of the consumer and prospects. They first understand the weakness in Oracles products and then win them over by offering customized middle ware, relation database systems and in-memory computing. Their target is small to midsized business. Oracle, on the other hand, uses an aggressive, industry-specific strategy. The focus is increasing its market share by providing a wide arrange of products from servers and storage to database management and middleware to CRM and business intelligence applications. Oracle doesn’t offer specific mid-market products but still has a chance to win them over through its partners. When it comes to cost Oracle cost in ownership is 46% lower than SAP, which gives them an edge because of their lower cost. Still based on brand SAP is regarded high because of its dedicated ERP system, although based on testing and deployment SAP doesn’t rate high.

![Worldwide ERP Software Market Share, 2012](image-url)
SOFTWARE ARCHITECTURES

Based on functionality, SAP provides original ERP software that enables real-time tracking and management of ERP essentials. While Oracle is an object relational database that can be implemented for ERP purposes. Both have strong integration capabilities and can even be integrated with each other. Some companies actually use a hybrid of both in their systems. But SAP has issues with customization without external assistance, meaning specialists are hired to personalize the system to their needs. Oracle has developed a pluggable architecture that is uses open industry standards that offer many advantages for organizations to integrate and customize architecture.

When it comes down to it the choice between SAP and Oracle is based on need. SAP has sets a standard in its uses so it takes longer to adjust a company’s architecture off that standard but gives a new company a basis to start with which is good for companies starting up who don’t want to deal with recreating a whole new architecture or can’t afford to redesign one. Oracle’s architecture is open meaning if a company whose architecture is already decided can easily integrate the system into their architecture but lacks the features contained in SAP. Some company’s chose both and integrates SAP’s IT infrastructure to the databases of Oracle taking the stronger points of both into their systems. But as stated they both are shown to things the other does not have.
There is a reason why these company’s declare themselves rivals. SAP has been developing ERP systems since its creation while Oracle has been expanding into the ERP market. SAP is show to have more experience with ERP along with a bigger clientele in the ERP market since it stands in the market the longest out of the two. Oracle on the other hand has multiple partners thanks it its many ventures such as middleware. As stated before, the biggest difference between the two is the need of the specified company hiring. SAP creates a standard with its many modules and can be bought in pieces based on need but at the cost of submitting to the standards. While Oracle is customizable and largely less expensive to integrate and deploy but lacks in scalability for smaller to midsize companies which is a very large market. It shows that even long standing systems have their drawbacks along with their strengths.

References


