

White Paper produced by PIMESTIC in 2008.

Pimestic is a Catalanian (Spain) government body set up to improve the competitiveness of local companies through the use of information technologies.
(www.Pimestic.cat)

Control and optimize company processes

ERP

Areas:

Purchasing and Logistics

Production and organization

Description

Companies need tools for managing their businesses in order to integrate and automate all the various processes. This can be achieved by using new technologies that facilitate the centralization of data, which is then shared and communicated within the business. Tools of this type are principally: an **ERP** (enterprise resource planning) system, the corporate **intranet** and **vertical solutions**.

The initials ERP stand for Enterprise Resource Planning. ERP is a management system that automates and integrates all business processes on an almost total basis. It does this for operational as well as production processes in a company.

ERP systems are comprised of different parts, called modules, which together form a single application. Each module is adapted for use within each of the different business areas: sales, purchasing, warehousing, stocks, project management, finances, accounting, human resources, delivery and collection logistics, etc. For this reason, it is considered to be an integrated system for company management that differentiates itself from specific applications, such as accounting programs. This is the principle difference between an ERP system and an application that only affects one company department. Likewise, the grouping of departmental applications that co-exist in a company can never be considered as an ERP system because, although it may cover all business processes, it does not provide integration. The key importance, therefore, of an ERP system is the possibility of data intercommunication between all departments in a company. An ERP system makes information available for all users, for the whole company, all the time.

ERPs aim to cover the following needs:

- Optimization of company processes. Involves modifying some processes and obtaining greater efficiency.
- Accessing data in a concise and secure way, in an integrated format.
- Centralizing and sharing information between all those involved within a business organization.

The fundamental purpose of an ERP system is to provide companies with a mechanism that allows efficient information management. This, in turn, facilitates decision-making processes, provides support for departments within the organization and decreases total operational costs as a result.

In functional terms, ERPs are systems comprised of modules that are adapted to business needs and which integrate data in order to make a complete whole. Modularity, adaptability and integration are the differentiating features of an ERP system, which make it a unique system in comparison with other business software.

ERPs allow simultaneous control of different business processes, permitting inter-departmental communication within a company. This means that when one process finishes another starts, sometimes in the same department and sometimes in different departments. For example, when a customer places an order with a company, the sales order needs to be automatically communicated to the production system, which generates the corresponding distribution planning, invoicing and accounting movements. This means that a single operator can set off a great number of processes in diverse modules and, in turn, the information is integrated and stored. When a company does not use an ERP system, it cannot carry out all these processes automatically or access the information in a centralized way. Not using an ERP can lead to work duplication, as well as the possible loss of or damage to information.

ERP systems are designed to provide a service for companies, which can be understood as a collection of departments that are inter-related through shared information, generated through business processes. The fact that an ERP system is divided into modules allows a company to save resources, as it is only necessary to install the module that provides the necessary service. This saves both money and resources. For example, a retail distribution company does not need a production module while a company from the IT sector that sells software does not need a logistics module.

In summary, ERPs have been designed to adapt to the working methodology of a company. This means that an ERP system has a generic form that permits a great variety of functional qualities, but that the implementation of the ERP system requires a modular approach that suits each company's needs. This process is called **parameter creation**, which involves modifying certain parameters within the application to obtain the desired behaviour of a specific module.

If a company normally controls the serial numbers of its products, this option should be activated and vice versa. In this way, and on the basis of the possible ERP features, functions can be activated or deactivated. Sometimes this modular system isn't so simple and more complex tools are required that are used by the assigned implementation project manager in order to achieve the desired functionality. This means that the potential or capacity of an ERP is determined on the basis of functions incorporated and the ease with which they can be adapted. Using this philosophy of adaptation, ERPs are easily integrated with the usual office tools (word processors, spreadsheets, etc.). This allows data obtained from the ERP to be incorporated into memos, annual reports, etc., or incorporated into data that comes from a spreadsheet, for example, within the ERP.

Other noteworthy characteristics of ERP systems:

- Modules interact together and consolidate all operations.
- Data is only input once and it is centralized in a database.
- Companies that implement ERP's usually have to modify a process or two so that it aligns with those of the ERP system.
- There are user roles, which mean that the available options for each operation are set according to a fixed user profile. For example, an accountant cannot access production modules, a sales representative can access sales modules and a manager can access any module. This also forms part of the application settings.
- The current trend is to offer specialized applications for specific type companies. These are known as vertical solutions (sector versions or applications), which are solutions most suitable, or developed, for specific business processes within a sector. They use predefined settings which are adapted to companies that have common processes: mining, automotive industry, publication, etc. There are also micro vertical solutions when the solution is applied to a more specific company of smaller size.

ERP solutions can sometimes be complex and difficult to implement because they require personalized development for each company, after the initial parameter creation. The modular adaption requires time and effort and, consequently, money in order to adjust it to all the business processes of a company. The creation, therefore, of a work team within the company is recommended to oversee and manage this process, so that costs as well as disruption to day-to-day work are minimized.

A corporate intranet can also be incorporated within the application, in an isolated fashion or integrated within the ERP, if available. An intranet is a computer network within a private local area network (LAN), which provides Internet tools. Its principal function, using data maintenance applications in addition to reports and queries, is to add to the centralized company database in order to maximize productivity. It is also an important means of transmitting internal information to workgroups or making global broadcasts to the whole company. Internal corporate networks are powerful tools that allow a company to transmit information effectively to employees so that they are kept constantly informed about the latest updates and news within the organization. Adding additional functionality, such as a good search engine and suitable organization, can allow employees to make quick and efficient queries for a significant amount of documentation.

Today, many ERPs can be easily adapted to the intranet, or even provide intranet services. Using the navigator, it is possible to access data maintenance forms via the ERP application. Furthermore, ERPs frequently have a user interface using the navigator, which means that the user can, therefore, have access via an Internet navigator. This also allows the integration of platform computers with incompatible operating systems, as well as other devices such as a PDA or PC Tablet (see glossary) because all of them have navigational tools. In this way, users can use all corporate tools (ERP, intranet, e-mail, etc.) independently of the type of machine, or even without the ERP application installed on their hardware.

The intranet, therefore, becomes the connection between all applications necessary for achieving maximum integration and communication within the company. For this reason, a powerful intranet has, for example, web mail (e-mail access through the navigator), an ERP adaptation for the navigator and a document management application via the web, in addition to a small corporate portal which can be used for consulting company regulations, job appointments, news, company organization charts, etc.

Advantages

- ERP tools and the intranet personalize the company, providing it with a stronger identity.
- Modular systems allow the company to benefit from flexibility, which facilitates growth, creation of new departments or reduction of the company structure.
- Adjusts to the company's needs.
- All company processes are integrated.
- Optimizes processes.
- An open model is used: other software adapts easily as a result of the simple interfaces, which facilitate the flow of data.
- Provides data security and integrity.
- Unifies software in a single application
- Data is centralized, quality control is improved and errors are avoided.
- A great variety of ERPs exist on the market. Every company can implement a system in accordance with their needs and potential. There are also open source ERPs that are completely free.
- Intranets and ERPs are adaptable to the web, while providing greater integration using a single means of access.

Investment and maintenance

The investment necessary for implementing an ERP system is difficult to quantify, as each case can vary in terms of the modules needed and the complexity of adaptation, amongst other considerations.

These quantities can vary considerably and range from \$1500 (Euros 1000, £800) for small-scale solutions to \$950,000 (Euros 600 K, £450 K) for complex developments.

In general, the investment needed by a company for the development of an ERP is based on the following:

- External consulting service: mapping requirements and negotiation of implementation plan.
- Module licenses
- ERP research and project.
- Configuration/implementation: adaptation to company and programming, if necessary.
- Audit and quality control.

There are free ERPs available on Internet, but these have adaptation costs which must be paid for by the company. At the same time, certain commercial ERPs can be very costly as the product itself is expensive and they can also have high implementation costs (consulting, programmers, etc.)

Maintenance costs range from 0 to \$ 9500 (Euro 6,000, £ 4,700) per month. Some open source ERP software does not require any maintenance, while other products have maintenance costs associated with incident management, modular adaptation, etc. This can, however, vary greatly according to the modules that have been installed, the number of users, the audits and quality controls, etc. Maintenance costs are derived from:

- Maintenance of incidents
- Module licenses
- Function checking audits
- Adaptations and new requirements.

Key points

- It is important to define what results are required with the implementation of an ERP system. When considering its implementation, research should be carried out to determine the desired results and the aim of the application. This means mapping requirements with a strategy to follow and the assignment of a human team for leading and controlling the implementation project. This is the most important factor in the implementation of an ERP.
- It is recommended that the business model is defined. The initial research should define the areas of company operation (current and future). If a company sells textile products, for example, it's important to predict the possible areas of growth when planning the ERP.
- It is also necessary to map and analyse each of the processes carried out within the company. This allows the ERP to be adapted to the company's working methods and not the other way round, so that the ERP is a digital image of the way in which the company functions.
- Implementing an ERP is not a simple or quick task and its success depends on the design of correct methodology and detailed planning.
- Evaluating opportunities for adapting complementary software within the ERP product can be useful at specific times. As company data comes from many different sources, the possible integration of different types of software should be considered: PDA, sensors, data sent via e-mail, etc. When selecting and implementing an ERP it is worth evaluating the possible interaction with third party software.
- It is also important to outline the structure and technological platforms so that the ERP or intranets function correctly with the hardware or software for which it has been designed. The amount of data that will be moved and stored should also be considered. The minimum (or optimum) system requirements that are expected must be outlined.
- A complete vision of the solution that is to be implemented is essential. When implementing the ERP, it is recommended that a prototype is designed or a model (even if theoretical) that illustrates examples of everything that will be carried out in the definitive model. This allows

possible problems to be foreseen as well as the creation of an implementation timetable. It also means that the associated costs can be calculated.

- To determine whether the implementation has been carried out effectively, and if it meets the expected result, control mechanisms must be used to measure results.
- Audits by independent organisations, or by staff of the company itself, are recommended to supervise the tasks correctly. Implementing an ERP system can take many working hours and incur high development costs; staying in control can save a lot of money for the company.

Success story

ARTE, SA

<http://www.arte-bcn.com/ca?2>

C/ Torrent Estadella, 62

08030 Barcelona

Tel.: 93 305 69 11

Success story summary

A company specializing in the manufacture of molds decides to move from a customized application to an integrated modular application.

Initial situation

ARTE, SA is a company specializing in the manufacture of plastic injection molds, located in Barcelona. Founded in 1952, it is the oldest in its area. It currently has 70 people on its staff and its installations are comprised of 15 workstations, 14 CNC milling machines and 6 electro-erosion machines in addition to other equipment. This enables the company to have strong production, design and experimentation capacity for the construction of molds, which has led it to specialize in car lighting.

Companies that use automated processes increasingly find that market trends force them to acquire greater technology within the manufacturing operations in order to be more competitive. This also means the incorporation of information and communication technology solutions into production: the acquisition of machines that can be digitally managed, working with quality control equipment, etc. This leads to the acquisition of software that is capable of managing production data. In turn, this software provides tools that aid the company with its decision making processes, allowing it to attain the standard levels and certifications required by its customers.

In 2002, having realised that the old software is inefficient, the company decides to modernize its software. The old software was designed by a company employee and was extremely limited in terms of its operating capacity and network communication. With time, the company realizes that the application is limited for the volume of production it oversees: there is no direct data available in relation to costs, the working times of machinery is unknown, etc. With this system, the company's competitiveness and efficiency are limited.

Challenge

Once the deficiencies of the system have been analyzed, the company decides to abandon the old program and acquire a new one that allows them to make a qualitative leap forward. There are no specific requirements that have been prioritized, but it is believed that the change will bring about improvements.

It is necessary, therefore, to incorporate software specializing in the industrial management of projects, but which can also meet management requirements of the other company departments

(administration, finance...). It is necessary, therefore, to implement software that plans company resources.

Company Management believes that this is a necessary step for the future in terms of the company's capacity to expand, both for production and quality control. If the company does not make these changes, it is feared that they will fall behind in an increasingly demanding market due to technological inefficiency. This is also a very real fear in light of the ISO certification requirements that necessitate a high volume of data management in relation to production and quality control.

Technological solution

They contact a company specializing in ERP solutions. After analyzing requirements and carrying out a study, an implementation proposal is made. The proposed solution is lengthy but it meets expectations perfectly. It also highlights changes that are anticipated within the company processes.

An ERP system is implemented to manage the complete production process: quotations, cost budgets, production orders, delivery notes, invoices, etc. The new ERP also allows the inclusion of file attachments with the aim of documenting all processes: plans, technical information, e-mails, etc. An interesting characteristic of the ERP system is that it is integrated with the computerized office tools, which aids administrative tasks.

Control devices are integrated into the shopfloor machines via data exchange interfaces. In this way, each machine records its start and stop times. This means that the manufacturing times can be calculated for each order. Furthermore, touch screens are installed which allow the operators to easily record the hours spent on each project. At the same time, an extensive database for materials is created. The end result brings about detailed knowledge of manufacturing costs for each part and improved time and attendance management.

The implementation of new software and the information that it helps provide allows the company to modify certain processes while creating new methodologies. This leads to a change of procedures, which rapidly achieves the expected results.

Implementation takes one and a half years and the final two months sees the new system running simultaneously alongside the old system.

Benefits

Now the company has a newly integrated and centralized software system that has led to the unification of working methodologies in all departments. The administrative departments have new management tools that have helped them develop invoicing processes, accounting, product portfolio management, human resources, etc. In other words, the whole company speaks the same computer language.

The previous application, prior to the new implementation, displayed data instability problems. This meant the company needed to protect itself from sudden events, such as unexpected computer crashes or problems due to the processing of large quantities of data. Before, measures were implemented in order to recuperate information that were not always successful, damaging the company. With the new software, the inefficiency is eradicated as the new application has an integral and strong data engine. For this reason, the time related to retrieval of lost data has been saved.

One of the improvements in the new application is the possibility of attaching any type of information. This is due to the mechanisms that allow the attachment of any kind of file at all times, which enables complete documentation of all processes. For example, plans for a manufactured part can be included, or an e-mail from the customer which specifies technical details. In this way, the process that accompanies the manufacture of an item is completely documented.

The incorporation of the new software tool leads to the consideration of production from new angles, which were previously inconceivable due to the shortcomings in the old software. For this reason, a new production plan is designed which favours performance and efficiency of the manufacturing

process while enabling a reduction in manufacturing costs. It also allows tighter planning of work on the shopfloor as well as the workers themselves.

As a result, the workload is quantified so that production orders and operators' time and attendance can be better managed. Shopfloor status is known in real time. Due to improvements in terms of the manufacturing process, quality control for production has improved. Now, the company produces more and better: the machines can operate at an optimum rate, quality has improved as there is far more manufacturing information available, and it is now easier to detect errors or quality deficiencies in the final product. This means that methods can be created for better part finishes, which gives added value to the company.

As a result of the improvement in company processes the company has been able to easily obtain ISO certifications, a prerequisite of its sector. The new software has provided the company with information and methods necessary for meeting regulations. It can now access parts of the market that were previously inaccessible which has also led to greater client satisfaction and trust.

It has also had to adapt to certain business processes that were required by the new software. This, in turn, leads to an improvement in company working methods. This process reengineering has been very positive for the company, as it has been forced to improve all its processes.

It is worth noting the total willingness of the company to transfer part of its data from the old system to the new system. ERPs allow the import of information from other platforms and save many hours of manual keying work by migrating old data into the new system. This is very important for users who may feel overwhelmed when faced with the technological change, leading to a slower pace of ERP implementation.

Experience

ARTE, SA evaluates the installation of the new ERP very positively, although the implementation period was fairly extended. An excellent match was achieved between the software and the company processes, which led to improved efficiency. Furthermore, both the company and those who carried out the implementation project improved their knowledge. This was the key for a successful project.

Another positive aspect of the implementation was the possibility of migrating a great volume of data from the old software. Had this not been viable, it would have been impossible to install the ERP, as there would have been too much information to enter into the new system.

Future plans

The ARTE management team currently considers that their ERP software is in a stable and consolidated status and no short-term improvements are required. The company is about to embark upon a process of expansion, which is a result of the incorporation of the new technology. This, in turn, does not leave time with which to react to software innovations and incorporate new management processes.

The suppliers of ARTE's ERP system have advertised a new version of the software that incorporates a new user interface adapted to current operating systems, which brings higher levels of user-friendliness due to the application's ergonomics. This new version will shortly be deployed after an audit is carried out to analyze what impact it may have within the company.

Success Story

Grup PROTEFIL

http://www.protefil.com/index_html?set_language=ca&cl=ca
C/ Ciutat d'Asunción, 44 bis
08030 Barcelona
Tel 93 345 21 92

Success story summary

A company specializing in the manufacture of high-precision molds incorporates an ERP for the first time ever into its working processes.

Initial situation

GRUPO PROTEFIL is comprised of the TECNOLOGÍA DEL PERFIL, SL and PROCESOS TECNICOS DEL MOLDE, SL, companies founded in 1979. They are consolidated as leading companies in the sector of mold manufacturers. They carry out the design, construction and repairs of plastic injection molds and high-precision molds.

Companies that manufacture molds need to make improvements to their production systems and, for this reason, they are increasingly using more communication and information technology. This company begins the process of modernizing its manufacturing process, which means acquiring equipment that uses digital processes. It also involves obtaining high performance machinery, in order to create a high quality end product. The companies in this sector are increasingly investing more in software in order to manage large volumes of production related information. This, in turn, will provide Management with a series of resources that facilitate decision-making processes. It also leads to better thought out production, which results in greater customer satisfaction. Furthermore, market forces are more demanding which means that companies have to be accredited with ISO certifications in order to guarantee product quality control and remain competitive.

In 2004 the company decides to install new software, as until that moment they did not have accurate knowledge of the unit cost for manufactured parts. These costs were calculated manually, based on experience acquired in previous manufacturing projects. Pricing proposals were based on similar projects carried out in the past and the prices were often inaccurate, which resulted in the company losing the customer due to overpriced quotations. Conversely, the company might lose money by producing a poorly calculated production order. This lack of knowledge resulted in the company being less competitive.

The software currently used at the company does not allow the integration of all company processes: administration, sales, purchases, etc. The new software, therefore, does not only have to be orientated towards the manufacturing process but also has to integrate with all company areas. All aspects of the company will, therefore, be integrated in a single database using one single working method for all users.

Challenge

With the aim of eliminating the lack of accurate production cost data, the company decides that it is important to install a new computer system. They investigate what would be the best solution for this problem. The solution must also use a single integrated system that includes all company departments and sections. The most adequate solution, therefore, is a enterprise resource planning tool or ERP.

For this reason the company decides to opt for an ERP, which also creates the possibility of obtaining an ISO certification. This means that the tool must have the relevant mechanisms required by the normative regulations for company processes (manufacturing documentation, task normalisation, etc). It must also digitalize all the processes of the various company departments (accounts, human resources, warehouse, orders, etc.).

Technological solution

Through an industry association, the company contacts a company specializing in ERP solutions for the metalworking sector. A study is carried out in order to determine the needs of the company as well as an implementation plan. During the initial phase the requirements are established, followed by the parameter creation stage (configuration of each module to be implemented) in order to deploy the new software.

The first challenge centers on calculating costs in relation to new production orders. Machine use, operation time and material are all factors that influence this cost. As a result of the functionality within the new ERP system these can be calculated before carrying out the production process. Production becomes more efficient, as a control is implemented for hours, operators and machinery (manufacturing parameters).

Another improvement gained from the ERP is the capacity to meet ISO 9001.2000 certification requirements, with the ERP system providing 80% of these. The certification is finally obtained in 2006.

The implementation takes approximately one and a half years. Maintenance is carried out every 6 months when technical enhancements, developed by the ERP supplier, are incorporated.

Advantages

The incorporation of this information and communication technology has led to the integration of all company departments, allowing greater fluidity in data exchange. Where one department's work finish another department's work starts, without interruption to the digital data flow. Currently, no data has to be duplicated or documents transcribed in the various areas of the company.

Production is more efficient, as resources have been optimized to reduce costs associated with each stage of the manufacturing process. Now, the exact time taken by a group of machines to finish a project is known. However, the most important benefit is that the cost budget for a specific project can be determined accurately, replacing the old system of approximation that created so many problems for sales. In the past, it was never known whether the cost of producing a part had been correctly budgeted until after it was manufactured and the real costs produced during manufacturing were known. With the new ERP system, this information can be calculated easily with data provided by the system, taken from the exact manufacturing parameters. All of these factors have been important for the sales department as they can now calculate accurate quotations, leading to greater market competitiveness.

One of the improvements brought about by the new management software is its capacity for adapting to certification regulations, as it fulfils 80% of these requirements. Consequently, only a small amount of organizational effort was needed in order to obtain the certification. This provides a qualification for the company, its products and working methods, which meets current and future customer stipulations.

A further important benefit derived from the ERP system is the provision of an overview of company status, in both the areas of production and administration. Currently, the workload of the manufacturing department is known at all times. Managers also know if there are sufficient raw materials for the following weeks' manufacturing orders. It is also known if a specific part will be

delivered on time to a customer, and whether this could represent a commercial risk. The integration of the whole system means that there is transparency of information across all departments, which is of vital importance for a company to function efficiently. This, in turn, means that the company processes can flow in accordance with the business plan.

Currently, due to the integration of operators' data captured via touchscreens, the company has time and attendance control. This has led to the accurate calculation of production hours, greater worker efficiency and mechanisms for calculating overtime, in addition to other situations that could affect the operators. This is also linked to the human resources module, which calculates payroll.

All these factors have contributed to an increase in company production and the company is now able to take on a greater number of orders, deliver them at the agreed time and plan the shop workload with the aim of ensuring sustainable and efficient production. It has not only led to a quantitative improvement in production but also a qualitative improvement, due to the adjustment brought about by the new ERP system and the incorporation of ISO normative regulations. Production is now greater with higher levels of quality control, which has delivered added value for clients. Sales have increased and the company image has been enhanced.

Experience

Grupo PROTEFIL has positively evaluated the implementation of the new ERP system, as it has provided a solution for the lack of information during the company decision-making process. It has also provided the company with tools that have improved their products.

Future plans

There is currently no change envisaged to the ERP system, as the satisfaction levels have been attained. The system is currently in the process of amortization. However, there may be small enhancements depending on what the software supplier offers in new versions.

Success Story

Matrices y Máquinas, SL

<http://www.matricesymaquinas.com>

C/ Mallorca, 31-33 (Polígono Industrial del Sector SO)

08192 Sant Quirze del Vallès

Tel 93 721 35 75

Success story summary

A company in the metalworking sector decides to change its obsolete and customized production management application for an integrated and modular application. This move is prompted by a restructure of the company group.

Initial situation

Matrices y Máquinas, SL is a company within the metalworking sector, specializing in the manufacture of molds and utilities for metal sheeting, located in Vallès Occidental. It has over 40 years experience in the sector and is part of Mikalor group, which works primarily within the automotive industry. There

are twenty employees and the company has advanced technology machines that are able to carry out any project, within the sector, with maximum precision.

Approximately four years ago the company group decided to restructure, which reduces the number of companies from 5 to 4. As a result of this change within the group, the company needs to be more competitive. They decide, therefore, that it is the right time to adopt more advanced technology and make changes in the corporate data management systems (management programs used until that time). At this time, the company used an application that had been customized by one of the company operators. This situation had allowed them to save costs, as only one single worker had created the whole program: he had a great understanding of the processes and the application's development costs were included in his pay check. The situation did, however, have certain disadvantages: the company depended completely on that one person and the application had a limited lifespan. It was expected that in time the application would become technically obsolete and would cease to function.

This situation became a problem when restructuring was carried out. The person responsible for maintaining the program was unable to continue and left the company which meant that the company then had nobody to maintain the application. The company had to resolve this situation quickly as their production depended on it.

Challenge

Given the situation with the management application, the company considers that the time is right to make a qualitative leap forward with its management system. The company decides to abandon the current customized software, written in COBOL|COCUENCO language, in favour of acquiring a new system that adapts to its requirements, but which is not excessively costly. This move allows the company to no longer be dependent on a single programmer and normalizes the situation by using a solution that comes from outside the company. The advantages of having complete control are given up, as the company has to entrust the solution to an external company that will manage the technological change with the associated costs. Despite everything, the change is inevitable and necessary to assure the company's continued viability.

Having reached this point, the company makes moves to obtain solutions and pricing proposals from various companies. Finally, a standard ERP solution is opted for, which is configured according to their requirements.

Technological solution

Once the impact of this technological advance has been analyzed in terms of both time and money, the company decides to acquire enterprise planning and resources technology. This option does not only provide a solution for production, but one for the whole company. The company contacts a specialist that carries out ERP installations with the aim of implementing the new technological solution. A software tool is selected that has all the modules that Matrices y Máquinas primarily needs: production, material purchases, warehouse, stocks, project management, sales, accounting, etc.

The company that undertakes the implementation project carries out a thorough study in order to determine requirements and then produces an application prototype. A prototype is no more than an initial adaption of the program that incorporates all functions within a test environment. This allows the analysis and evaluation of the prototype performance in order to assess weaknesses and improve the definitive version. Users for each module evaluate the prototype and feedback in order to improve the application. The prototype has a small cost initially that is subsequently deducted from the final project invoice. The company approves the prototype and enters into the next phase: implementation.

Using this first ERP version, all the modules needed to be adapted to business processes are installed. These adaptations (parameter creation) are always coordinated by the development team and the respective departmental managers. Even then, small software adaptations must be made in order to satisfy specific methodology. This means that the ERP does not immediately include certain functions, although these can be added later. All improvements that are needed are incorporated gradually into the application.

The implementation process takes three months, during which time the new system runs simultaneously for one month alongside the old system. The installation company, via the Internet, carries out maintenance remotely. This is the best method for carrying out the task, as it is fairly flexible and response times are good. The total implementation cost is \$ 15,700 (Euros 10,000 £ 7,800) and monthly maintenance \$ 580 (Euros 370, £290). It is calculated that the cost will be paid off in approximately two or three years.

Advantages

One of the most important benefits derived from upgrading technology, centres on eliminating the company's dependency on one programmer responsible for managing the application. This gives the company more freedom as the service is outsourced to the company responsible for the implementation. In other words, it professionalizes its operations. In the past, the company was totally dependent on the person responsible for the program which meant that if he was ill or on holiday the company was unable to treat certain problems. This situation created stress for the company and also put the future of the company in a precarious position, which became very obvious at the moment of restructuring.

An authentic ERP environment is adopted with the new application. This means that the company goes from a customized vertical solution to an integrated and centralized solution. It enables a more dynamic flow of information between the company departments. For example, when the user responsible for materials enters a new reference, it is already available for the manufacturing and quality control departments. Likewise, when a settlement is made it is already traceable to the corresponding invoice from the accounts department.

This means an increase in efficiency, as data is able to circulate more quickly from one department to another. The company no longer has to resort to double data entry or duplicating management. The improvement in terms of the work is, therefore, substantial. If in the past, control over production was carried out independently of the material, now the existing stock for a specific reference is known without anyone having to go and check it physically.

A customized program that evolves gradually has the advantage of doing exactly what is needed. However this only happens in its early phases. After a period of time, and with the incorporation of new functions, technical constraints occur that are unsolvable. This makes company growth increasingly more difficult.

Lack of global vision with the old customized application means it is difficult to foresee future functional requirements. For example, if a discount field is not applied to a specific project document (because it wasn't necessary to begin with), it may have to be added after the application has grown. Due to technical constraints, many functions in the old application cannot be considered. The new application, however, incorporates functions that the old software did not offer.

These new functions enable production status and conditions to be known. For example, now it is possible to know the exact cost of a part before production as all the times associated with the machinery, operators, finishing processes, are already known. This means that production improves and there is greater information available at all the stages of the process affecting each manufactured part.

Another benefit of the implementation of an ERP system is the improvement in customer service. If a customer orders new parts, the factory workload can easily be determined in order to respond with a realistic delivery date. As a result, the company can obtain a better price for the service delivered.

The new application optimizes company resources. The company is much closer to knowing the real work times for operators, as well as the capacity of a given machine, etc. This allows accurate calculations to be made for equipment amortization as well as forecasts for when a new machine tool may be required. Efficiency calculations can be carried out and key indicators can be developed in order to create a company health check, etc. This is a useful tool for any company manager.

As the new application comes with remote online support, ERP maintenance times have been significantly reduced. This is due to the application's Internet connection as well as security mechanisms. In this way, support can be provided quickly and effectively without the need for physical intervention which always generates direct and indirect costs. This reduction in time has allowed the company to ask for enhancements as these can be quickly implemented.

Matrices y Máquinas can process many more orders since the new ERP system was installed, which has led to positive growth and a good market position. In other words, the computer system is no longer holding back company growth.

Another important, often overlooked, benefit derived from the installation, is the improvement in operators' working conditions. The new ERP system means that the users are happier because their work is easier. They receive more information and it is no longer necessary to duplicate data entry or work with other paper or computer documents (spreadsheets). When users realise that the company is facilitating their work by providing them with a good management tool, their performance improves and the working day becomes easier.

Company management now has more data at their disposal to aid the decision-making process. When examining a leasing contract for a new machine, for example, they can calculate the machine's performance rate and, consequently, its period of amortization. This, in turn, means that better financing conditions can be negotiated. Likewise, if an item of raw material's turnover is known, purchasing can be performed under the best conditions. Having access to information is of great strategic importance for company management and provides them with the tools they need to steer their business.

Experience

Implementation of an ERP system has led to a series of improvements, which have facilitated the work of everybody within the company. This, in turn, has generated an overall increase in production.

Despite the difficulties that a change in the computer system presented initially, especially for the users, its installation has been well received. The company particularly values the ease of data management as well as having overcome certain technical issues that slowed down the old system. The installation has provided users with new functions, some of which have been gradually incorporated into the system and others that are expected to be incorporated at a later date.

Matrices y Máquinas considers the installation of an ERP system as a positive move.

Future plans

The incorporation of new functions within the application is expected in order to optimize current processes and provide new capabilities that aid the work process.

With the upcoming changes in operating systems, a new user interface is expected - one that is much more intuitive and easy to use.