The Ultimate Guide to ERP

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In this e-guide:

ERP is the nervous system of modern businesses. Learn how it works, understand its risks and benefits, and get tips on deployment in this wide-ranging guide.

In this e-guide

The ultimate guide to ERP

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It is hard to imagine modern business without ERP. From its roots more than 50 years ago in the first financial and production planning tools used by manufacturers, ERP has grown to become a mainstay in all but the smallest businesses.

ERP, or enterprise resource planning, is networked software that handles the transactions and record-keeping of the essential functions of any business, such as sales, purchasing, accounting and human resources. Installing an ERP system is one of the boldest steps an organization can take to computerize its business activities.

Read on to learn the basics of ERP and the steps to deploy it, and click on the links for more detail and in-depth analysis.

What does an ERP system do?

ERP software consists of connected but distinct components, or modules, each of which enables workers to carry out the functions of a particular business

In this e-guide

process or department, such as sales, customer relationship management (CRM), inventory management and finance.

ERP differs in essential ways from other types of business software -- say, a basic accounting package used by one person or a small group.

An important differentiating feature of ERP is the integration between modules that enables the modules and users to interact. For example, a sales order created in the CRM module will be shared with the production module so workers in the manufacturing department will have the information about what product to make. When the product is shipped, data in the inventory management module changes, and when the customer pays, the accounting module records the revenue.

Another distinguishing feature of ERP software is the central database in which the modules record transactions and other information, access that data and share it (see Figure 1). Having this "single source of truth" -- that's an ERP industry buzz phrase -- saves users from having to enter information more than once. It also improves data accuracy and facilitates reporting and collaboration.

ERP also usually maintains a consistent look and feel across modules, unlike a collection of separate software applications from different vendors. This consistency, at least in theory, makes it easy for workers to learn the system and move around the modules. In reality, many people find ERP software

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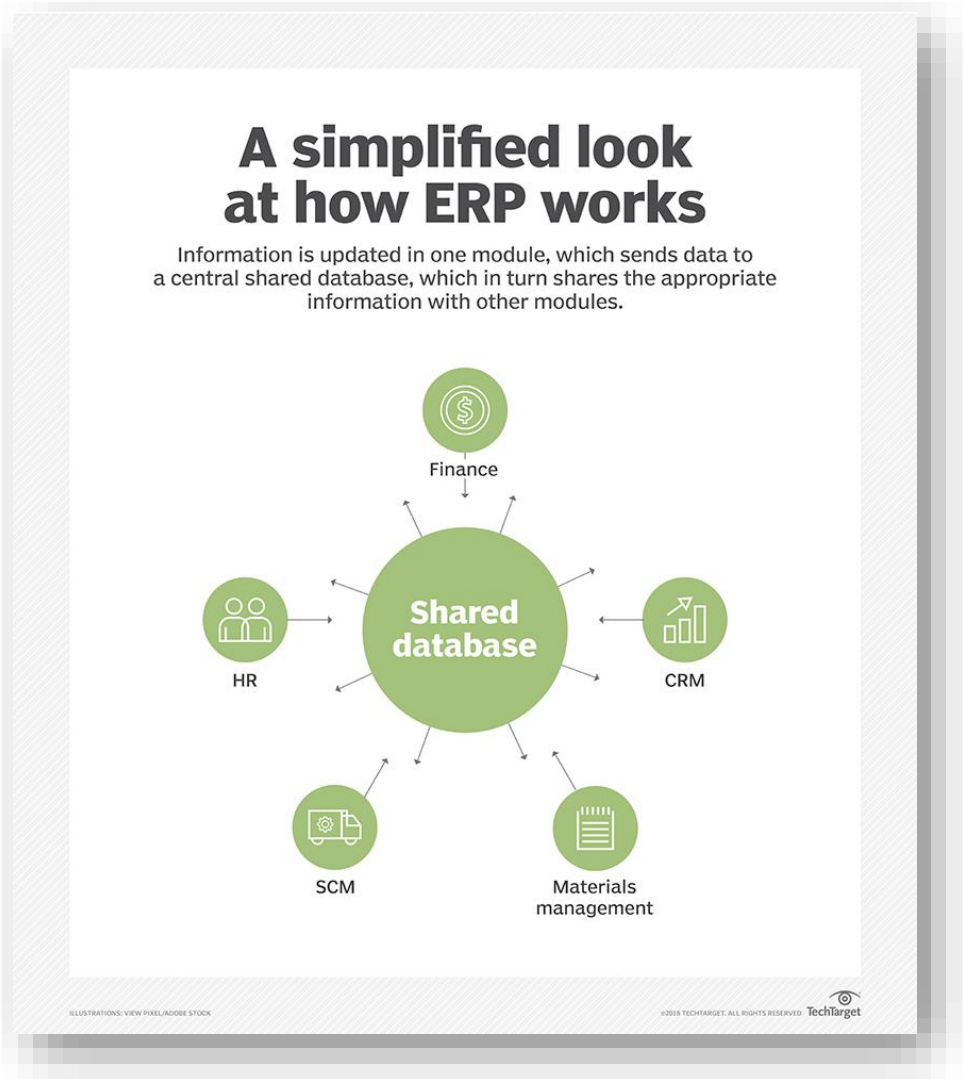
difficult to use -- especially if it is a decade or two old and hasn't been updated with graphical user interfaces (GUIs) and other usability improvements.



In this e-guide

What are the advantages and disadvantages of ERP?

The sheer size, interconnectedness and complexity of ERP is both a blessing and a curse (see Figure 2).

When ERP software is running well and closely aligned with an organization's ways of doing business, it makes an enterprise's all-important business processes function more smoothly and opens up new possibilities, such as redeploying workers or implementing an omnichannel e-commerce strategy. But when deployment is delayed or the system goes down unexpectedly, ERP can bring business to a standstill and force users to scramble, looking for manual alternatives. And an older ERP system with unintuitive screens and poorly designed workflows can put a drag on a business that threatens its very existence.

But the biggest disadvantage of ERP, one that has frequently led to lawsuits, is the significant risk and cost of a failed or severely delayed implementation. ERP implementation failures often make headlines; at least two such failures involved projects that topped $1 billion. One high-profile case was the 2018 suit that investors of cosmetics maker Revlon filed when problems implementing SAP ERP allegedly disrupted manufacturing operations and delayed shipments.

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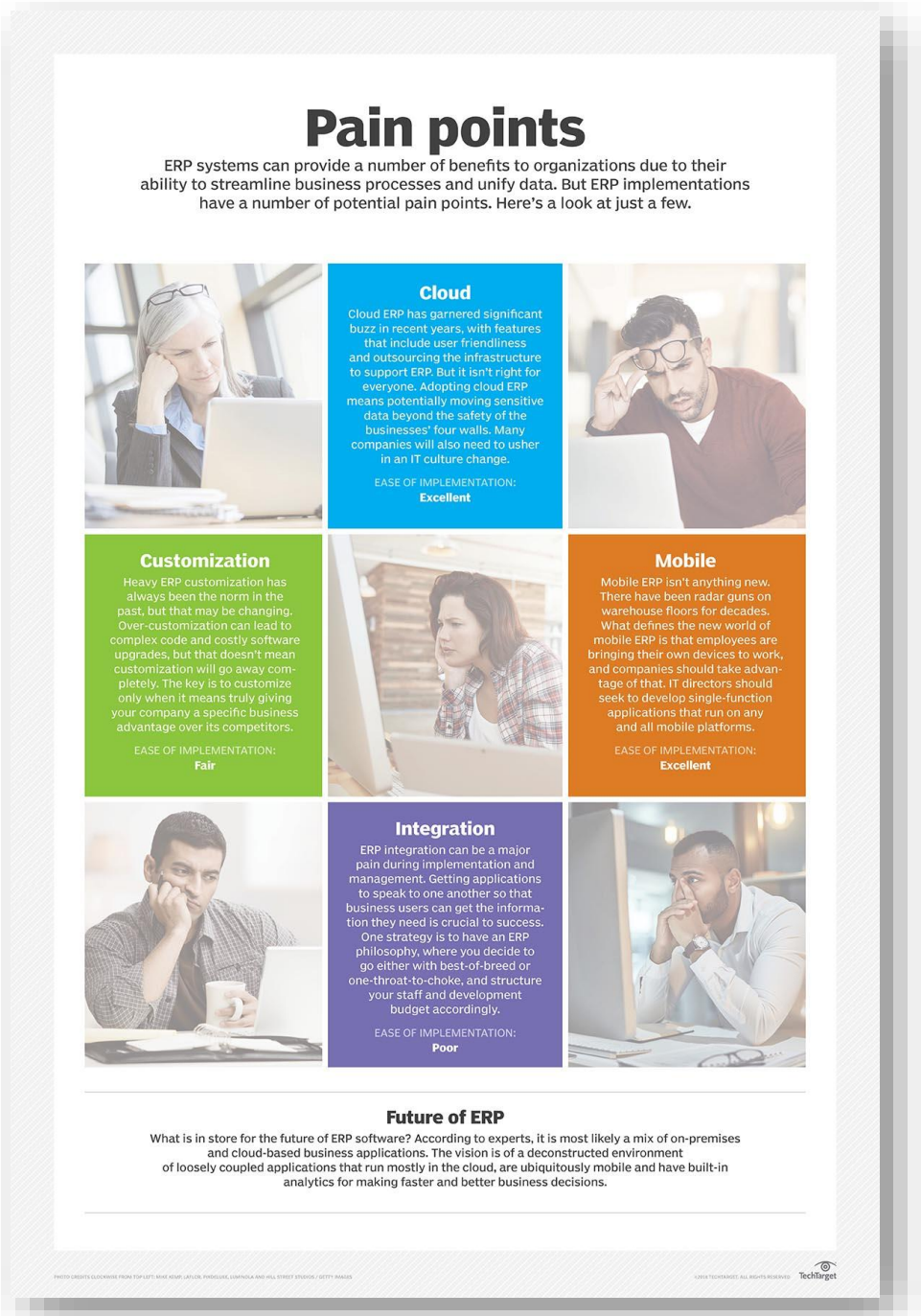

Pain points

ERP systems can provide a number of benefits to organizations due to their ability to streamline business processes and unify data. But ERP implementations have a number of potential pain points. Here's a look at just a few.

Cloud

Cloud ERP has garnered significant buzz in recent years, with features that include user friendliness and outsourcing the infrastructure to support ERP. But it isn't right for everyone. Adopting cloud ERP means potentially moving sensitive data beyond the safety of the businesses' four walls. Many companies will also need to usher in an IT culture change.

EASE OF IMPLEMENTATION:
Excellent

Customization

Heavy ERP customization has always been the norm in the past, but that may be changing. Over-customization can lead to complex code and costly software upgrades, but that doesn't mean customization will go away completely. The key is to customize only when it means truly giving your company a specific business advantage over its competitors.

EASE OF IMPLEMENTATION:
Fair

Mobile

Mobile ERP isn't anything new. There have been radar guns on warehouse floors for decades. What defines the new world of mobile ERP is that employees are bringing their own devices to work, and companies should take advantage of that. IT directors should seek to develop single-function applications that run on any and all mobile platforms.

EASE OF IMPLEMENTATION:
Excellent

Integration

ERP integration can be a major pain during implementation and management. Getting applications to speak to one another so that business users can get the information they need is crucial to success. One strategy is to have an ERP philosophy, where you decide to go either with best-of-breed or one-throat-to-choke, and structure your staff and development budget accordingly.

EASE OF IMPLEMENTATION:
Poor

Future of ERP

What is in store for the future of ERP software? According to experts, it is most likely a mix of on-premises and cloud-based business applications. The vision is of a deconstructed environment of loosely coupled applications that run mostly in the cloud, are ubiquitously mobile and have built-in analytics for making faster and better business decisions.

See a larger version of the image here.

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Nevertheless, the advantages of ERP usually outweigh the disadvantages. Among the highlights are the following:

Advantages

- ERP can save money over the long run by streamlining processes.
- It provides a unified system that can lower IT, labor and training costs.
- ERP enables a clearer view into critical parts of the business, such as sales, working capital and inventory.
- It facilitates reporting and planning through improved data and analytics.
- It offers better compliance and security through standardized workflows and fine-grained control of user rights.

Disadvantages

- ERP software can be expensive to deploy and maintain.
- It is often difficult to implement.
- It requires significant change management.
- ERP modules are often less sophisticated than specialized software and go unused or must be replaced.

Key features of ERP systems

Most ERP systems handle the core business processes -- either in dedicated modules or in subfunctions of other modules -- that are common to all kinds of enterprises. However, the ERP finance module is the only one in every ERP

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product, since every company needs the ability to process financial transactions and account for them. It automates basic accounting, invoicing, financial analytics, forecasting and reporting.

Other commonly used core ERP modules include human capital management (HCM), order management, sales management or CRM, and purchasing or procurement.

Companies that make or distribute products need additional modules with specialized capabilities. The most common ones include the following:

- material requirements planning (MRP);
- inventory management;
- manufacturing management, or production management; and
- supply chain management (SCM): complex processes for demand planning and logistics, including transportation management systems and warehouse management systems.

Some organizations add still another layer of modules that are even more specialized or provide advanced capabilities. For example, a company might augment the basic HR functions of its HCM system -- such as payroll, benefits and employee records -- to add talent management software with modules dedicated to recruiting, training, evaluating and compensating employees. A consultancy, construction firm or other business whose work is typically organized into projects might add a project management module. A manufacturer with its own distribution centers might buy an SCM suite from

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another vendor that has sophisticated transportation and warehouse management software that comes with prepackaged integration to the ERP. In recent years, ERP vendors have bolstered their products with emerging technologies that are sweeping through other sectors of the IT industry. Today, the hottest ERP trends are all about making ERP more interactive, intuitive and "intelligent."

Chatbots are taking over many of the ERP tasks, such as invoice processing and customer service, formerly handled by humans. Artificial intelligence improves ERP data analytics by "learning" to recognize patterns and make recommendations. Natural language processing makes it possible to control ERP by speaking into a voice user interface.

On-premises ERP vs. cloud ERP vs. hybrid ERP

ERP systems are designed to run either "on premises" in the owner's data center, or in the cloud on computers maintained by the vendor and delivered to users over the internet.

Choosing a deployment option is one of the biggest decisions an ERP buyer has to make because it affects almost every aspect of an ERP system, including the types of features that are available, implementation time, user-friendliness and cost.

In this e-guide

Early cloud versions of ERP had fewer modules and capabilities than on-premises versions. Today, the two systems have neared parity, with cloud deployments offering some important advantages.

In most cases, cloud ERP doesn't require the computing infrastructure of on-premises ERP. Instead, the software vendor or cloud service provider manages it. A cloud ERP implementation can therefore be far cheaper in terms of purchase, deployment and maintenance costs.

Thanks to the flexibility of cloud computing resources, cloud ERP can be easier to scale up and down as needs fluctuate. Automatic upgrades, which are also managed by the vendor, can deliver new technologies faster and with less hassle than is possible with on-premises ERP.

However, not all cloud ERP deployment options are alike, and ERP vendors often fudge the terminology. Options include the following:

- **Multi-tenant.** The purest type of cloud ERP, multi-tenant SaaS ERP, is usually streamlined with fewer modules and features than on-premises ERP. Multiple users share the same copy of the software, which makes it cheaper, simpler and more standardized than most on-premises ERP.
- **Single tenant.** Another type of SaaS, called *single tenant*, cordons off the software to give the buyer more control over the ERP, including the ability to customize it, which is usually not possible with multi-tenant SaaS.
- **Private cloud and hosted ERP.** Two other varieties of cloud ERP, private cloud and hosted ERP, typically just involve running the same on-

In this e-guide

premises software on an outside provider's data centers, though they may have some characteristics of cloud computing such as economies of scale from shared infrastructure as well as on-demand use and pricing. Some companies maintain their own private cloud infrastructure -- an extreme example of how much the lines between on-premises and cloud ERP have blurred.

- **Hybrid ERP.** The fact that SaaS ERP, particularly multi-tenant, usually can't be customized is a major drawback for companies that need the custom features and integrations of an on-premises ERP system into which they have usually sunk significant time and money. As a result, hybrid ERP, which combines on-premises and cloud ERP modules and related applications, is an increasingly popular way to gain some of the technological benefits of SaaS without losing the security of an older, familiar system. It raises daunting integration challenges, however.

Payment terms also vary for the different types of ERP deployments. Unlike on-premises ERP, which usually requires an expensive long-term license paid upfront, SaaS is generally sold by monthly per-user subscriptions. However, the differences between cloud ERP and on-premises ERP pricing aren't quite so clear-cut because some vendors combine features of the two.

How to choose an ERP system

Finding an ERP product that will fit the organization's needs requires following a methodical process that typically includes these major steps:

In this e-guide

1. **Assigning a team.** The ERP buying process starts with forming a project team led by a project manager and usually consisting of department heads, senior executives and IT.
2. **Defining requirements.** The project team is charged with understanding the organization's current and aspirational ERP use cases, then gathering the requirements and wish lists of stakeholders.
3. **Researching vendors.** The requirements planning stage provides the framework for researching ERP software vendors and asking the most promising ones to respond to a request for proposal (RFP) detailing how they will deliver the requirements. Some vendors may be called in to give sales presentations.
4. **Identifying the shortlist.** The project team names a small group of vendors it believes is most likely to meet the requirements.
5. **Scheduling demos.** The shortlisted vendors are called in to demonstrate how their software performs in real-world circumstances, sometimes in a competitive "bake-off."
6. **Selecting a vendor.** After negotiating price and terms, the buyer signs a contract with the chosen vendor.

In practice, completing each major step requires several substeps and significant data collection. For example, requirements planning often involves surveys and meetings with users, or a formal gap analysis to determine whether the organization's business software meets current and future needs. Many organizations perform a financial analysis to assess the stability of shortlisted vendors and interview customers with similar needs.

The final choice usually comes down to how closely a product matches the buyer's required timeline, features, ease of use and price, and whether it

In this e-guide

supports current or planned business processes. A product's deployment options can also tip the balance, besides heavily influencing the other criteria. A SaaS ERP product, for example, is more likely to fit a shorter implementation timeline and be easier to use than an on-premises system; but, as noted, it might lack the specialized functions a company needs to stay in business.

Buyers entering the market will find a few dozen ERP vendors that vary widely in size and target markets. There is specialized on-premises ERP for small law firms and giant chemical producers, basic cloud ERP for the project management and accounting of global consulting firms, and obscure brands of ERP sold mostly to regional manufacturers and distributors in the U.S.

Some ERP vendors, including Acumatica, NetSuite and Sage Intacct, specialize in the needs of SMBs, offering relatively affordable and simple ERP for common financial, order management and HR functions. Such entry-level products may be a company's first ERP system when it outgrows basic accounting software, but they can usually be expanded with additional modules and "scale," or grow, to accommodate more users and business functions.

Four major-brand ERP vendors -- Infor, Microsoft, Oracle (including NetSuite) and SAP -- have the biggest market shares, with nearly half the worldwide total. These four also have the broadest product lines that span from entry-level ERP to complex software suites for multinational conglomerates, as well as specialized versions for most major industries. Some market researchers include Sage Intacct and Workday -- a fast-growing maker of SaaS HCM and

In this e-guide

accounting software -- among the market-share leaders, but neither vendor has quite the breadth of products as the top four.

Other prominent ERP vendors include Epicor, IFS, Kenandy, Plex Systems, QAD and Syspro.

ERP implementation

ERP implementation best practices call for a formal process, overseen by an ad hoc team drawn from every major department, that extends from the conceptual stage to post-implementation support and, ultimately, upgrading or replacing the system. Project management methodologies, tools and software are essential in managing what could be a multiyear process.

Once a vendor is chosen, the implementation begins. In the case of an ERP upgrade from one system to another, companies usually run and test the new ERP system in parallel with the old one to confirm that it works properly before committing to a launch date. Data migration then consumes much of the time and resources needed to ensure the new system can take over business processes with minimal disruption.

The best practices don't end when the system is deployed. Companies must communicate the benefits and features of the new system in advance, then maintain a training process for current and incoming employees. A

In this e-guide

comprehensive, effective change management strategy can be the difference between ERP implementation success and failure.

ERP support

The new system also has to be maintained. ERP vendors or their support partners offer tech-support services, usually contracted for an additional fee. They typically include a help desk reachable by phone, email or online; a dedicated customer web portal with FAQs, user manuals and other documentation; and access to discussion forums. On-site support typically provides implementation assistance, troubleshooting and training. Software development may be a significant part of support if the ERP system needs customizing, extending or integrating with other systems.

Most companies maintain their own ERP support staff, even if it is just one IT person who has other responsibilities. Larger companies may have several people whose job it is to keep the ERP system running, train users and interact with the ERP vendor, systems integrator or service provider. "ERP administrator" is a common title in the IT world.

The growing popularity of cloud ERP is bringing major changes to the internal ERP support function, which used to focus mostly on maintaining the ERP system itself. Now, ERP administrators must be knowledgeable about the capabilities of SaaS business applications, figure out how to assemble them into

In this e-guide

an ERP system, and understand the needs of customers and other external users.

Multi-tiered ERP systems

The word *tier* comes up often in the context of ERP. It has two meanings.

The most important -- because it describes an actual software architecture -- is what's referred to as *two-tier ERP*, a strategy that typically involves pairing a large, often older (or "legacy") on-premises ERP system in corporate headquarters with smaller, cheaper, often SaaS-based ERP systems at divisions and remote offices. The two tiers are integrated, especially for accounting, finance and other companywide processes such as HCM, and can be from different vendors.

Two-tier ERP can be a good strategy for extending ERP to more locations while providing remote offices with more control, flexibility and agility to meet local needs.

The second use of *tier* is as a way of classifying ERP software and vendors by size. In this scheme, tier 1 ERP products are built for and typically purchased by the world's largest name-brand companies and sold by the biggest vendors. The tier 1 group usually includes SAP, Oracle, Microsoft and Infor. Tier 2 vendors are next in the rankings, measured roughly by revenue. Like tier 1 vendors, they

In this e-guide

sell systems for both large companies and SMBs. Tier 3 vendors are the smallest and often sell ERP for niche industries.

The tier-ranking system for vendors and products is controversial, highly arbitrary and has begun to fall out of use.

Why is ERP important?

In one form or another, ERP has been at the center of efforts to exploit the data processing and calculating capacity of computers to manage complex business processes. This important software began as *MRP*, a system invented in the 1960s to plan the materials needed in manufacturing that was later extended to other factors such as financials (see Figure 3), and renamed *manufacturing resource planning* (MRP II).

When MRP II grew to encompass even more processes like payroll, HR and sales, the need for a generic term became clear; in 1990, *ERP* was coined. Today, MRP and ERP continue to play essential roles in manufacturing, and ERP has become the digital nervous system of business.

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MRP vs. MRP II vs. ERP

	MRP	MRP II	ERP for manufacturing	ERP for service businesses
Material requirements planning	■	■	■	
Basic records (bills of material, routings)	■	■	■	
Inventory management	■	■	■	■
Production scheduling	■	■	■	
Capacity planning		■	■	
Master production scheduling	■	■	■	
Purchasing and procurement	■	■	■	■
Customer order management	■	■	■	■
Customer relationship management			■	
Forecasting and demand management		■	■	
Cost accounting	■	■	■	
General accounting (AR, AP, GL)	■	■	■	■
Asset tracking and cash management			■	■
Payroll and human resources			■	■
Marketing automation			■	
Advanced planning and scheduling			■	
Quality management			■	
Manufacturing operations management			■	
Project management			■	
Engineering release			■	
Warehouse management			■	
Transportation management			■	
Field service scheduling and management			■	

NOTE: DEFINITIONS OF MRP, MRP II AND ERP FUNCTIONS VARY, AND SOME ERP PRODUCTS LACK THESE FUNCTIONS.
SOURCE: DAVE TURBIDE

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Few observers would doubt that ERP has also had a positive influence on the global economy. The anecdotal evidence from individual companies is both convincing and unsurprising, and it springs largely from the usual benefits of computerizing manual, paper-based processes.

Digitizing business transactions and records usually speeds them up and makes them more accurate and reliable. Sharing this real-time or near-real-time information over a network helps workers across departments make better decisions, coordinate their activities, collaborate more effectively and minimize the avoidable errors caused by miscommunication. It also helps businesses respond more quickly to changing conditions.

Tapping into the internet to open these ERP channels to the outside world helps to align supply and demand by tying the desires of customers more intimately to the actions a company, its suppliers and partners take to develop and deliver products and services.

This ongoing "digital transformation" of nearly every corner of the business world, enabled in large part by ERP, has made new conveniences, such as mobile e-commerce, possible. It has also helped to integrate the world economy by enabling -- or, at the very least, supporting -- global manufacturing, supply chain analytics and industrial IoT.

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At the same time, digital transformation calls for a new set of ERP skills that emphasizes broad business expertise and collaboration to write the next chapter in the long partnership between ERP and business.

Further reading

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SearchERP

SearchERP was built to help startups, small and mid-sized businesses, and large corporations better leverage modern ERP technologies and strategies.

We cover all pockets of ERP, including: software selections and implementations, on-premise and cloud infrastructures, integration, financials, manufacturing management, internet of things (IoT), artificial intelligence (AI), sales and operational planning and much more.

For further reading, visit us at:

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