

Justification of ERP Investments*

The expected return on investment provides the cost justification and motivation for investing in ERP. There are quantifiable benefits as well as intangible benefits in the ERP investment decision. The quantifiable benefits have a bottom-line impact on profitability, asset turnover, and a potential effect on stock value.

This section discusses the quantifiable and the intangible benefits of an ERP system, which compares firm performance before and after implementing ERP. Other scenarios are encountered in justifying ERP investments. For example, a firm may be considering replacement versus upgrade or re-implementation of an ERP software package.

There are significant costs for not successfully implementing an ERP system. Manufacturers often pay more for the lack of systems than they would have paid for improved systems. They carry excess inventory or provide poor customer service, for instance. And manufacturers may invest in ERP without gaining the benefits because the systems are partially implemented, unsuccessfully implemented, or usage deteriorates over time.

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- Quantifiable benefits from an ERP system
- The intangible effects of ERP
- Costs of implementing an ERP system
- Replacing or re-implementing an ERP system

Quantifiable Benefits from an ERP System

Studies that surveyed manufacturers about the impact of ERP systems on firm performance indicate that company size and industry do not affect the results. Benefits have been indicated for large and small firms, whether they make standard or custom products or are in discrete or process manufacturing environments. This section explains the quantifiable benefits in terms of several areas of improvement.

Typical Benefits

The most significant quantifiable benefits involve reductions in inventory, material costs, and labor and overhead costs, as well as improvements in customer service and sales.

Inventory reduction. Improved planning and scheduling practices typically lead to inventory reductions of 20 percent or better. This provides not only a one time reduction in assets (and inventory typically constitutes a large proportion of assets), but also provides ongoing savings of the inventory carrying costs. The cost of carrying inventory includes not only interest but also the costs of warehousing, handling, obsolescence, insurance, taxes, damage, and shrinkage. With interest rates of 10 percent, the carrying costs can be 25 percent to 30 percent.

ERP systems lead to lower inventories because manufacturers can make and buy only what is needed. Demands rather than demand insensitive order points drive time phased plans. Deliveries can be coordinated to actual need dates; orders for unneeded material can be postponed or canceled. The bills of material ensure matched sets are obtained rather than too much of one component and not enough of another. Planned changes in the bills also prevent inventory build up of obsolete materials. With fewer part shortages and realistic schedules, manufacturing orders can be processed to completion faster and work-in-process inventories can be reduced. Implementation of JIT philosophies can further reduce manufacturing lead times and the corresponding inventories.

Material cost reductions. Improved procurement practices lead to better vendor negotiations for prices, typically resulting in cost reductions of 5 percent or better. Valid schedules permit purchasing people to focus on vendor negotiations and quality improvement rather than on expediting shortages and getting material at premium prices. ERP systems provide negotiation information, such as projected material requirements by commodity group and vendor performance statistics. Giving suppliers better visibility of future requirements helps them achieve efficiencies that can be passed on as lower material costs.

Labor cost reductions. Improved manufacturing practices lead to fewer shortages and interruptions, and less rework and overtime. Typical labor savings from successful ERP are a 10 percent reduction in direct and indirect labor costs. By minimizing rush jobs and parts shortages, less time is needed for expediting, material handling, extra setups, disruptions, and tracking split lots or jobs that have been set aside. Production supervisors have better visibility of required work and can adjust capacity or loads to meet schedules. Supervisors have more time for managing, directing and training people. Production personnel have more time to develop better methods and improve quality and throughput.

Improved customer service and sales. Improved coordination of sales and production leads to better customer service and increased sales. Improvements in managing customer contacts, in making and meeting delivery promises, and in shorter order to ship lead times, lead to higher customer satisfaction and repeat orders. Sales people can focus on selling instead of verifying or apologizing for late deliveries. In custom product environments, configurations can be quickly identified and priced, often by sales personnel or even the customer rather than technical staff. Taken together, these improvements in customer service can lead to fewer lost sales and actual increases in sales, typically 10 percent or more.

ERP systems also provide the ability to react to changes in demand and diagnose delivery problems. Corrective actions can be taken early, such as determining shipment priorities, notifying customers of changes to promised delivery dates, or altering production schedules to satisfy demand.

Improved accounting controls. Improved collection procedures can reduce the number of days of outstanding receivables, thereby providing additional available cash. Underlying these improvements are fast accurate invoice creation directly from shipment transactions, timely customer statements, and follow through on delinquent accounts. Credit checking during order entry and improved handling of customer inquiries further reduces the number of problem accounts. Improved credit management and receivables practices typically reduce the days of outstanding receivables by 18 percent or better.

Trade credit can also be maximized by taking advantage of supplier discounts and cash planning, and paying only those invoices with matching receipts. This can lead to lower requirements for cash-on-hand.

ERP System Benefits on the Balance Sheet

Benefits from improved business processes and improved information provided by an ERP system can directly affect the balance sheet of a manufacturer. To illustrate this impact, a simplified balance sheet is shown in figure 3.1 for a typical manufacturer with annual revenue of \$10 million. The biggest impacts will be on inventory and accounts receivable.

In the example, the company has \$3 million in inventory and \$2 million in outstanding accounts receivable. Based on prior research concerning industry averages for improvements, implementation of an ERP system can lead to a 20 percent inventory reduction and an 18 percent receivables reduction.

Figure 3.1 Summarized balance sheet for a typical \$10 million firm

	<u>Current</u>	<u>Typical Improvement</u>	<u>Benefit</u>
Current assets			
Cash and other	500,000		
Accounts receivable	2,000,000	18%	356,200
Inventory	3,000,000	20%	600,000
Fixed assets	<u>3,000,000</u>		—————
Total assets	\$8,500,000		\$956,200
Current liabilities	xxx,xxx		
Non current liabilities	xxx,xxx		
Stockholder's equity	<u>xxx,xxx</u>		
Total liabilities and equity	xxx,xxx		

- **Inventory Reduction.** A 20 percent inventory reduction results in \$600,000 less inventory. Improved purchasing practices (that result in reduced material costs) could lower this number even more.
- **Accounts Receivable.** Current accounts receivable represent seventy-three days of outstanding receivables. An 18 percent reduction (to sixty days' receivables) results in \$356,200 of additional cash available for other uses.

ERP Benefits on the Income Statement

A simplified, summary income statement for the same \$10 million manufacturer is shown in figure 3.2. For many manufacturers, the cost of sales ranges from 65 to 75 percent of sales (the example will use 75 percent). Using industry averages for each major benefit, the improved business processes and associated information system almost double the current pretax income.

- **Inventory Reduction.** A 20 percent reduction in the current inventory of \$3 million results in ongoing benefits of lower inventory carrying charges. Using a carrying cost of 25 percent results in \$150,000 in lower carrying charges each year, identified here as part of the administrative expenses.
- **Material Cost Reductions.** A 5 percent reduction in material costs because of improved purchasing practices results in annual savings of \$225,000.
- **Labor Cost Reductions.** A 10 percent reduction in labor costs because of less overtime and improved productivity results in annual savings of \$100,000.
- **Increased Sales.** Improvements in customer service typically lead to a 10 percent sales increase; this is not shown in figure 3.1.

Annual benefits totaling \$475,000 in this example almost equals the current pretax income of \$500,000.

Figure 3.2 Summarized income statement for a typical \$10 million firm

	Typical			
	<u>Current</u>		<u>Improvement</u>	<u>Benefit</u>
Sales	\$10,000,000		10%	
Cost of sales	7,500,000			
Material	4,500,000	60%	5%	\$225,000
Labor	1,000,000	13%	10%	\$100,000
Overhead	2,000,000	27%		
Administrative expenses	2,000,000			\$150,000
Pretax income	\$ 500,000			\$475,000

ERP Impact on Key Financial Ratios

Ration analysis provides another way to look at the impact of an ERP system. Three ratios illustrate the effect---two related to liquidity and one to operating performance.

- *Inventory turnover* (Cost of Sales/Inventory). Low inventory turnover can indicate possible overstocking and obsolescence. It may also indicate deeper problems of too much of the wrong kind of inventory which can create shortages of needed inventory for production and sales. High turnover indicates better liquidity and superior materials management and merchandising. Given the example \$10 million company, the current

number of inventory turns is 2.5. With a 20 percent inventory reduction, the number of inventory turns increases to 3.1.

- *Days of Receivables* ($365 * 1/(\text{Sales}/\text{Receivables})$). This ratio expresses the average time in days that receivables are outstanding. It is a measure of the management of credit and collections. Generally, the greater the number of days outstanding, the greater the probability of delinquencies in accounts receivable. The lower the number of days, the greater the cash availability. With an 18 percent reduction in receivables, the current days receivable of seventy-three days can be reduced to sixty. This means \$356,200 is available for other purposes.
- *Return on Assets* (Profit Before Taxes/Total Assets). This ratio measures the effectiveness of management in employing the resources available to it. Several calculations are necessary to determine the return on assets. In this example, the return on assets can be improved from 5.9 to 12.9 by effectively implementing an ERP system.

Performance evaluation based on ratio analysis can also use comparisons between one's own company and similar firms in terms of size and industry. The Annual Statement Studies provide comparative ratios for this purpose. This use of comparative ratio analysis will use the same three ratios for inventory turnover, days receivable, and return on assets. To perform the analysis, you identify the median and upper quartile ratios for firms in the same industry. These roughly correspond to average and good performance. By comparing the ratios with your firm's current performance, you can calculate how much better your company should be performing to be competitive. The same analysis can be performed using the "BenchmarkReport.com" website.

Using the inventory turns ratio for the example \$10 million manufacturer, assume the Annual Statement Studies indicate that the median and upper quartile are four and six turns for other firms in the same industry. Average performance of four inventory turns translates into an expected inventory of \$1.875 million (\$7.5 million divided by four). If the example firm had this ratio, it would have had \$1.125 million less in inventory. With inventory carrying costs at 25 percent, this would produce savings of \$281,250 each year.

For the days receivable ratio, assume the Annual Statement Studies indicate that sixty and fifty days are the median and upper quartile. The days receivable in the example \$10 million manufacturer is currently seventy-three days; an improvement to sixty days would reduce receivables by \$356,200 (using a daily sales rate of \$27,400 and a thirteen day reduction). This means that cash is available for other purposes.

Note that the return on assets ratio is 5.9 for the example company. Assuming the Annual Statement Studies indicate the return on assets is ten and fifteen for firms in the same industry at the median and upper quartiles, improving the return on assets to equivalent levels would mean increased profits or asset turnover.

ERP Impact on Stock Price

If the integration and improved information of an ERP system results in a better balance sheet and increased profits, these improvements should impact stock price for the company. Although stock price is affected by a variety of factors, the typical effect of improved profits and balance sheet ratios can be estimated. Using the already described example of \$10 million manufacturer and typical benefits, and assuming 100,000 shares outstanding and an existing stock price of \$30.00 per share, the stock price exhibits the effects of an effective ERP, as figure 3.3 shows. With a price/earnings multiplier of six, the stock price for the example company could be increased from \$30 to \$58.80 per share.

Figure 3.3 Calculating the potential stock appreciation

	<u>Before ERP</u>	<u>After ERP</u>
Before tax profit	\$500,000.00	\$980,000.00
Earnings per share	\$ 5.00	\$9.80
Current stock price	\$30.00	6 * 9.80 = \$58.80
Multiplier	6	6

These calculations suggest that ERP systems can lead to significant impacts on financial results, including the balance sheet, income statement, key ratios, and stock price.

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The Intangible Effects of ERP*

The intangible or non-financial benefits of an integrated enterprise resource planning (ERP) system can be viewed from several perspectives. For illustrative purposes, the discussion will focus on the benefits for accounting, product and process design, production, sales, and management information system (MIS) functions. From the overall company standpoint, ERP provides a framework for working effectively together and providing a consistent plan for action.

Each of the intangible effects could be quantified in terms of cost savings. Duplicate data maintenance, for example, requires personnel time in entering data (and possibly managerial time in determining which set of data should be used for decision making). Expediting efforts have a visible effect of consuming personnel time. These quantified cost savings can also be used to show impacts on financial results.

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Effects on Accounting

With a common database from ERP, accounting no longer requires duplicate files and redundant data entry. Product costing, for example, can be performed using accurate and up to date product structures. Product costing simulations can be used to analyze the impact of changing material costs, labor rates, and overhead allocations as well as planned changes to bills and routings. Differences between actual and standard costs are highlighted as variances. Order related variances help pinpoint problem areas.

Customer invoices can be based on actual shipments (without duplicate data entry), which helps speed invoice processing. Payables can use purchase order and receipt data for three way matching with supplier invoices.

As manufacturing transactions are recorded, the financial equivalents are automatically generated for updating the general ledger. This provides a complete audit trail from account totals to source documents, ensures accurate and up to date financial information, and permits tracking of actual versus budgeted expenses. Detailed transaction activity can also be easily accessed on line for answering account inquiries.

Since manufacturing transactions automatically update the general ledger, time consuming manual journal entries can be eliminated. Period end closing procedures can be performed in hours or days, rather than weeks. This improves reduces clerical accounting work, and improves the timeliness of financial reports.

Financial reports can be easily customized to meet the needs of various decision makers. Financial projections can be based on detailed ERP calculations for future requirements. Cash planning, for example, can account for current and projected sales orders and planned purchases, as well as current receivables and payables. Decision support tools (such as spreadsheets, graphics packages and data managers) can use the financial data maintained in the ERP database.

Effects on Product and Process Design

The product structure database offers engineering much greater control over product and process design, especially in terms of engineering change control. Planned changes can be phased in and emergency changes can be communicated immediately.

ERP systems offer numerous analytical tools for the engineering function. When diagnosing the impact of changes to materials and resources, for example, engineers can check where used information to identify the affected products. Lead time reduction efforts can use critical path analysis of item lead times in multi-level bills to focus attention on those key components affecting cumulative manufacturing lead time. Costed multi-level bills can be used to focus cost reduction efforts on high value items. Bill comparisons can be used to highlight differences between products or between revisions of the same product such as to identify upgrade kit requirements.

ERP systems support custom product configurations. Rules-based configurators reduce the need for expert assistance from engineers, and ensure sales personnel (or even customers) can develop timely accurate configurations. Cost estimates and pricing for custom product configurations can also be quickly calculated.

Effects on Production and Materials Management

ERP systems help establish realistic schedules for production and communicate consistent priorities so that everyone knows the most important job to work on at all times. Visibility of future requirements helps production prepare for capacity problems, and also helps suppliers anticipate and meet your needs. As changes to demands or supplies do occur, ERP helps identify the impact on production and purchasing.

Finite scheduling capabilities in ERP ensure production activities get scheduled based on capacity, tool and material constraints. Scheduling rules help minimize setup times and optimize sequencing. Changes in factory demands, as well as changes in available machine time, labor headcount and skill levels, tools, and material, can be immediately simulated to assess the impact on production and purchasing. ERP helps eliminate many crisis situations, so people have more time for planning and quality. Buyers can spend more time in vendor negotiation and quality improvement. When the shortage list is no longer used to manage the shop, the quality of working life can improve.

Effects on Sales

Customer service can be improved by making valid delivery promises and then meeting those promises. Custom product quotations can be developed faster and more accurately, which improves job estimating. Delivery lead times can be shortened and customer inquiries on order status can be answered immediately.

E-commerce capabilities enable customers to place orders and check status over the internet at any time. In addition to customer convenience, this reduces the time requirement for sales and customer service personnel.

Effects on the MIS Function

An ERP system implemented as an integrated software package offers several advantages to the MIS function. The software package can offer a growth path from simple to comprehensive applications built on top of a database management system. It provides an upgrade path to technology and functional enhancements supported by the software vendor. It can reduce the development time and cost for software, documentation, and training classes. These costs would be incurred before the firm can start obtaining the benefits of an ERP system. It permits the MIS staff to focus their attention on organizational change and servicing user needs for customization and professional assistance.

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Costs of Implementing an ERP System*

Enterprise resource planning (ERP) implementation costs can be divided into one-time costs and ongoing annual costs. Both types of costs can be segmented into hardware, software, external assistance, and internal personnel.

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One-Time Costs

Software. The cost of an ERP software package varies widely, ranging from \$30,000 (USD) for micro-based packages to several million for some mainframe packages. The number of concurrent users generally drives the software costs, so that smaller systems cost less. For illustrative and general guideline purposes, the software package costs range from \$50,000 to \$200,000 (USD) for smaller manufacturers. In addition to the ERP software package, one-time costs may include systems software, development of customized software, or integration with other applications.

Hardware. Hardware selection is driven by the firm's choice of an ERP software package. The ERP software vendor generally certifies which hardware (and hardware configurations) must be used to run the ERP system. Hardware may need to be replaced or upgraded. As a general rule, small to medium-size manufacturers already have microcomputers and a local area network, so that a micro-based ERP system built on de facto standards requires little additional investment in hardware.

External Assistance. External assistance includes the consulting and training costs to implement the ERP package. The software vendor, reseller or independent

consultant groups may provide external assistance. The amount of required external assistance is dependent on several factors, such as the complexity of the ERP package, the experience or knowledge of internal personnel, and the extent to which external personnel are used in place of internal personnel to implement the system.

A general guideline for these costs has been the ratio with the cost of the ERP software package. A comprehensive micro-based ERP package typically has a .5 to 1.0 ratio; the manufacturer requires \$.50 to \$1.00 (USD) of external assistance for each dollar of software package costs. The elapsed time for implementation of the entire ERP application typically requires four to six months. Many of the mainframe ERP packages have a three to five ratio for the costs of external assistance. The software package typically costs more, and the elapsed time for implementation requires nine to twenty-four months.

Internal Personnel. Internal personnel time reflects the time commitments for the implementation project team, the executive steering committee, the users in various functional areas, and management information system (MIS) personnel. The time commitments include training classes, development of internal procedures for using the system, developing customized reports and applications, preparation of the data, meetings with external consultants, and team meetings. A general guideline for internal personnel costs can also be expressed as a ratio with the ERP software costs, where a typical ratio is .5 to 1.0.

The one-time costs for implementing an ERP system can be simplistically estimated using typical ratios with ERP software costs. These ratios are summarized in figure 3.4 for one-time and ongoing annual costs, along with example calculations for a \$100,000 (USD) ERP software package.

Figure 3.4 Estimating costs for implementing a new ERP system
(in USD)

One-time costs	Ratio to software purchase cost	Example ERP system
ERP software	1	\$100,000
Hardware	-	-
External assistance	.5 to 1.0	\$100,000
Internal personnel	.5 to 1.0	\$100,000
Total one-time cost		\$300,000

Annual costs	Ratio to software purchase cost	Example ERP system
ERP software	.25	\$25,000
Hardware	-	-
External assistance	.1 to .2	\$20,000
Internal personnel	.1 to .2	\$20,000
Total annual costs		\$65,000

The one-time and ongoing annual costs for hardware are not included in the example. In many cases, the use of de facto standard hardware means that a firm already has the hardware for an ERP system. The example shown in figure 3.4 indicates an estimated \$300,000 (USD) for one time costs and \$65,000 (USD) for annual costs related to an ERP system.

OnGoing Annual Costs

Software. Ongoing software costs should include the annual customer support agreement with the ERP software and vendor. This customer support typically provides telephone assistance and software upgrades and is typically priced around 15 percent to 20 percent of the software price. Upgrades to system software releases will also be required.

The upgrade path for new releases of the ERP software package is critical. New releases contain enhancements for functionality and bug fixes, and ensure the software runs on the latest technology platform. From the user's point of view, the upgrade path enables the manufacturer to take advantage of hundred of man-years of development efforts undertaken by the ERP software vendor (and other technology vendors) with minimal investment. From the vendor point of view, it is much easier to support users on the latest releases. However, user changes to source code and other user customizations can make it very expensive or even impossible to upgrade. Additional costs must then be incurred to ensure the customizations work with the latest upgrade. As shown in the example estimates in figure 3.4, a ratio of .25 has been used for total annual costs related to ERP software.

A phased implementation approach may mean that additional software must be purchased. A data collection system, for example, may be implemented as part of a second phase. Hardware. Ongoing hardware costs will reflect new requirements specified by the ERP vendor to run the software.

External Assistance. External assistance should be used as part of a continuous improvement program to effectively use an ERP system application for running the company. Training and consulting can focus on improved business processes, new or poorly used software functionality, and training of new personnel. A phased implementation approach requires additional assistance at each phase. Additional customizations may be required, especially with evolving user sophistication. As shown in the example estimates in figure 3.4, a ratio of .1 to .2 could be used for total annual costs related to external assistance.

Internal Personnel. The implementation project team does not necessarily end its responsibilities at time of system cutover. A phased implementation approach and continuous improvement efforts will require ongoing time commitments. Employee turnover and job rotation will also require ongoing training efforts. The nature of the ERP software package (and associated system software and hardware) typically mandates the number and expertise of MIS personnel needed for ongoing support. It may range from a part-time clerical person (for administering a micro-based ERP package) to a large group of MIS experts (for some mainframe ERP packages). As shown in the example estimates in figure 3.4, a ratio of .1 to .2 could be used for total annual costs related to internal personnel.

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An investment analysis focusing on enterprise resource planning (ERP) benefits frequently applies to those firms initially justifying an ERP implementation. It can also be used to justify a “re-implementation” when the initial efforts have failed to produce desired results. The box describing “Classifications of ERP success” identifies situations where the ERP implementation falls short of producing desired benefits.

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Classifications of ERP Success

Several measures have been used to gauge the successful implementation of an ERP system. The impacts on business performance and bottom-line results provide the best measure of success. Another measure of success is the degree

to which the formal ERP system is used to run the business. Four classifications – -termed Class A through Class D---have often been used to characterize success.

Figure 3.5 summarizes these classifications of ERP success.

Figure 3.5. Classifications of ERP success

Class A	Management team uses ERP system to run the business Complete and accurate data (99%+)---one set of numbers Using latest versions of ERP software Company gains the full benefits of an ERP system
Class B	Management team not fully using the ERP system Mostly complete and accurate (90% to 95%) data Some informal or non-integrated systems Company gains partial benefits of an ERP system
Class C	Partial use of ERP system, such as sales orders and accounting Incomplete and inaccurate (<90%) data Many informal or non-integrated systems Not gaining the integrative benefits of an ERP system
Class D	System not used by anyone System only running on the computer

Class A User. The formal ERP system is effectively used to run the entire company. The manufacturing database defines the way products are really built, and efforts have been undertaken to simplify factory layouts and business processes. The ERP system defines realistic agreed-upon S&OP (sales and operations planning) game plans that cover all demands, sales orders have realistic delivery promises, and the schedules are actually used to coordinate supply chain activities. Coordination efforts reflect action messages, with a manageable number of exceptions. The ERP system correctly updates accounting and provides useful management information. The ERP system typically reflects the latest releases from the software vendor.

Class B User. The formal ERP system is partially effective in being used to run the entire company. It defines S&OP game plans, but they typically lack company-wide agreement and completeness. Supply chain activities are frequently initiated that do not reflect schedules from the ERP system, and the volume of action messages frequently makes them difficult to use. Unrealistic delivery promises on many sales orders contribute to the problem, and also create a larger-than-necessary volume of exception conditions requiring expediting. Some informal and parallel systems are employed to manage expediting outside the formal system. While the manufacturing database provides a reasonably complete and accurate model of how products are really built, there are just enough exceptions to make some people question the formal system. The accounting applications are closely coupled to operational reporting, but sufficient exceptions exist to make the financial impacts suspect.

Class C User. The formal ERP system is only used in part of the company, typically in recording information about sales orders, shipments, purchase order receipts and accounting applications. The manufacturing database provides an incomplete or inaccurate model of how products are really built. S&OP game plans are typically non-existent, and unrealistic delivery promises are made on many sales orders. Several informal or parallel systems are required to coordinate procurement and production activities, typically with excessive expediting efforts and duplicate data maintenance. The accounting applications are not closely coupled to the activities reported in production. The ERP system reflects an old version of the software package.

Class D User. The formal ERP system is not used to run any part of the company, and might be “running” only in the management information system (MIS) function. Informal and parallel systems are being used to manage the business.

Over the last twenty-five years, field surveys about ERP success indicate approximately 10percent of firms achieve Class A status, 40percent are Class B, 40percent are Class C and the remainder (10percent) are failures.

Many manufacturers think they need a “new system” when they really need to upgrade and re-implement their current ERP software package. They can be characterized as a “Class B” or “Class C” user, and are not achieving the possible benefits---both quantifiable and intangible. In many cases, they are using an older version of the software package and have made significant customizations. The estimated costs to upgrade and re-implement are typically less than a “new system”, as illustrated in figure 3.6. In this example, some general rules of thumb (or ratios) have been used to estimate the one-time costs.

Figure 3.6 Costs for re-implementing or upgrading an ERP system

One-time Costs	Ratio to software purchase cost	Example ERP system
ERP software Upgrade to new release Upgrade customizations	?	\$30,000
Hardware Upgrade hardware	-	-
External assistance	.2 to .5	\$30,000
Internal personnel	.2 to .5	\$30,000
	Total one-time cost	<u>\$90,000</u>

The costs to re-implement an ERP system should be significantly lower than implementing a new system. The users have familiarity with system usage, and should know the system strengths and weaknesses. Many firms can live with the shortcomings of their existing system. External assistance from the software vendor and consultants can help develop solutions to shortcomings, and should in any case be part of continuous improvement efforts. With a firm understanding of

the re-implementation costs and shortcomings, the investment decision should be justified on the basis of benefits.

Many manufacturers are faced with decisions about replacing their current ERP software package or homegrown system. The replacement decision can stem from any number of situations. The current ERP software package is no longer supported; is too expensive to maintain; is heavily customized and cannot be upgraded; runs on old technology; is too complex and expensive to implement; and so forth. A homegrown ERP system provides partial solutions or non-integrated solutions; it's not on the right technology platform; nobody knows the system and can support it; nobody can upgrade the system; and so forth. The investment decision in these cases tends to use cost comparisons between alternatives.

The starting point for cost comparisons should be the previously discussed classification of costs, both one-time and ongoing annual costs. The following case study illustrates the use of cost displacement as the basis for ERP investments.

Case Study: Cost Displacement as the Basis for ERP System Replacement

Several autonomous plants of a multisite manufacturing firm implemented a stand-alone micro-based ERP package at each site because it was a cheaper alternative than the corporate standard. The corporate ERP system was a complex mainframe system that required very high levels of external assistance, large expenses for customizations, and high charge-out rates from the corporate MIS function. The one-time and ongoing costs for the corporate system were two to three times higher. The plant management even argued (successfully) that they could implement the new system in three months, obtain the benefits over a six month payback period, and ultimately throw it away in two years when the corporate MIS function was finally ready to implement the mainframe system at their plants. Three years after these plants successfully implemented the single-site ERP system (with three month implementation periods), the plants are still using the system while other sites within the company have struggled to even partially implement the mainframe system. The cost displacements (and benefits) have been estimated to be more than one million dollars.