Issues in multinational ERP implementation

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Abstract: Enterprise resource planning (ERP) systems have been credited with providing competitive advantage in multinational business operations, to include supply chains. Multinational implementations of ERP involve added complexity. This paper uses case studies and other reports of multinational ERP implementation to identify implementation factors of importance. Four technical factors were identified (business process reengineering, federalism and customisation, supply chain features and outsourcing). Additionally, more general issues were compared (culture/language, management style, political factors and labour skills). Multinational ERP implementations radically change organisational information systems. Careful planning of how to implement ERP systems is needed in multinational environments in order to identify the best ERP design and the best redesign of business processes.

Keywords: enterprise resource planning systems; multinational information systems; information systems implementation.

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1 Introduction

Enterprise systems (or enterprise resource planning systems – ERP) have been instrumental in advancing efficiency in organisations throughout the world. However, David Hebert of the Hackett Group stated, "Only a select few companies have gotten value out of their ERP implementations, and those are world-class companies". The ERP has the reputation in industry of being notoriously over-sold and under-delivered (Millman, 2004). Cliffe (1999) reported that 65% of executives believed that ERP could be harmful. Scott Phares, Vice President of Services for Business Engine, called ERP the most expensive but least-value derived kind of IT implementation (Millman, 2004).

Still, enterprise systems offer tremendous opportunities to more consistently provide information systems to organisations in a standardised, centralised and cost-efficient manner. In part, enterprise systems implementation is driven by ever-increasing regulatory reporting requirements, such as the Sarbanes-Oxley Act in the USA and International Accounting Standards in Europe and Asia. While ERP has been credited with providing competitive advantage in some environments (such as international supply chains, Akkermans et al., 2003), the ERP market is maturing. Ken Stoll, a partner with Accenture, was quoted as stating that ERP value is eroding, because everybody has it (Millman, 2004). That may be true in parts of Europe and the USA where every competitor may have some form of enterprise system. But worldwide, enterprise systems implementation is still in a growth stage.

Sheu et al. (2003, 2004) examined ERP implementations in the USA Taiwan, China and Europe and focused on cultural and national differences in multinational ERP implementation. Language, politics, government regulations, management style and labour skills were all found to vary in ERP implementations across countries and were found to be important factors in ERP project success. Multinational organisations have been primary drivers of ERP expansion internationally. Often, multinationals involve supply chains, another driver for increased internationalisation of ERP. The current study synthesises some reports of enterprise systems implementation in multinational and supply chain domains.

This paper will review selected reports of enterprise systems and associated BPR success and failures in the international context. Section 2 briefly outlines our methodology. Section 3 introduces four reports of multinational ERP cases with the

problems encountered and lessons learned, proposed by the authors of those reports. Section 4 discusses BPR aspects of these cases and also expands upon Davenport's (1998) idea of federalisation, which seems very appropriate for multinational enterprise systems. Web linkage to ERP systems in supply chain applications (which by their nature tend to involve multinational organisations) will be addressed, as well as the positive and negative aspects of outsourcing in the multinational ERP environment. Section 5 will review multinational issues in ERP implementation. Section 6 will provide conclusions.

2 Research methodology

The methodology used in this study combined case analysis with review of global ERP implementations reported in the academic literature. The first step was to identify cases and related publications. The cases reviewed in Section 3 were found. The literature review also identified other refereed journal reports of global ERP implementation issues. Our study extracted four technical areas of ERP implementation that could be explained by the ideas presented in Section 4. There also were more general issues that seemed to us to be important in ERP implementation as outlined in Section 5.

We did not have a rigid template for our study, but in general our approach included the following steps:

- gather refereed reports of ERP implementation from the published literature
- identify problems reported along with their attributed causes
- develop a list of ERP implementation features that we felt were important to global ERP success or failure, considered in light of theory
- cross-reference these cases and reports to compare results supporting or refuting contentions
- synthesis of technical and general issues.

3 Multinational ERP success and failure

Carton and Adam (2003) reported four case studies of ERP implementation in Irish manufacturing firms. Each of these firms was involved in international operations and included a pharmaceutical company, an international subsidiary of a computer equipment manufacturer, a manufacturing subsidiary of another pharmaceutical company and a subsidiary of a manufacturer of electronic devices. The ERP systems are attractive in multinational environments because they gain efficiencies (including supply chain efficiency discussed above) with less technical risk than many other IT projects. However, there were a number of issues identified by Carton and Adam.

- shifting to ERP can be a painful learning process, requiring unlearning old ways of working
- subsidiaries of multinational firms are often faced with changes imposed, rather than designed

- implementation of ERP systems usually lead to integration of data, which has the effect of centralising ownership, away from the multinational subsidiary
- IT support also is often centralised (as a way to reduce IT cost), while responsibility for accurate data entry is shifted back to the point of entry, increasing the responsibility and work of the subsidiary
- ERP implementation can often change the balance of power within organisations, usually favouring central administration at the expense of subsidiaries.

There have been a number of reports of ERP failure (multinational or not). Motwani et al. (2002) cited dramatic ERP project failures in applications such as Hershey Foods, the City of Oakland, Miller Industries and WW Grainger Inc. A recent update of one of the more spectacular ERP failures (FoxMeyer Drug) was provided by Ehrhart (2001). We focus on four reports involving multinational implementations of enterprise systems with the intent of comparing how multinational factors played a role in their success or failure.

The four studies selected for examination involved various degrees of multinational enterprise systems implementation reported in recent years (meaning that all systems were implemented in the 1990s). Table 1 provides some comparative details of these four studies.

Table 1 Multinational studies compared

Study	*Organisation*	*ERP Type*	*Vendor*	*Outcome*	*Brief Specifics*
Al-Mashari and Zaire (2000)	Major manufacturer	Supply chain	SAP R/3	BPR unsuccessful	Cost overruns Delays Benefits below expectations
Motwani et al. (2002)	Two distributors	Supply chain	Not provided	Comparative	Incremental and bureaucratic strategy more successful than revolutionary
Sarkis and Sundarraj (2003)	Texas Instruments	Web	SAP	Mostly successful	Initial productivity dip Late deliveries Inventory reduced 15% Output up 5–10%
Yusuf et al. (2004)	Rolls-Royce	Conventional	SAP R/3	Mostly successful	Data cleanup Training challenges

Among these studies, the ERP implementation in Al-Mashari and Zaire (2000) was considered unsuccessful. The others were all considered successful, but some with less features than desired (which should be expected with all information technology projects). All of the studies reporting a vendor involved SAP, the largest

provider of enterprise systems. Indeed, some seem to define ERP as SAP, although there are a number of competitor vendors in a highly dynamic market. Various degrees of international characteristics were involved, from supply chain support linking international customers and suppliers (Al-Mashari and Zaire, 2000) and major firms operating in many countries (Sarkis and Sundarraj, 2003; Yusuf et al., 2004). Motwani et al. (2002) compared a firm operating within one country with another operating internationally.

4 Technical issues

In addition to the cultural differences noted by Sheu et al. (2003, 2004), we look at four technical issues:

- BPR
- federalism and customisation
- supply chain requirements
- the value of outsourcing in this environment.

4.1 Business process reengineering

> "It wasn't Oracle that got us the savings, but rather the reengineering of existing business processes, most through elimination of systems, reduction of headcount, streamlining processes." (Mitch Spitzer, VP GreenPoint Financial Corp., cited in Millman, 2004)

All four of the studies given in Table 1 reviewed BPR in cases involving multinational ERP installations. We will briefly review what each said, relative to BPR, in multinational ERP projects.

The motivation to adopt ERP systems was often financial and accounting based. Manufacturers were also motivated by a desire to replace MRP systems, in order to support complex operations involving multiple plants, suppliers and in the case of multinational operations, dealing with multiple currencies (Kalakota and Whinston, 1997). Al-Mashari and Zaire (2000) found that BPR was effective in reducing overlapping activities for the major manufacturer they studied and also reduced handoffs (transfer of paper) in shipping, invoicing, order processing and other activities. In that case, BPR resolved problems of linking inquiries, consolidating forecasts, identifying production delays, eliminating shipping delays and lowering the level of finished goods inventory. Through BPR, processes were standardised and more thorough and systematic procedures put in place. Systems department skills were aligned with current technology (an indication of reduction of expensive IT payroll, often the way in which ERP reduces costs). There was lower demand for development programmers and higher need for user involvement. Computer platforms were made uniform for more efficient and seamless operation. This case planned an 18-month BPR exercise. The final expenditure on BPR was $2.8 million and the resulting system was not considered successful due to budget overruns, delays and benefits less than expectations. These problems are given in Table 2.

Table 2 BPR problems reported

Study	*BPR problems*	*Suggested resolution*
Al-Mashari and Zaire (2000)	Anxiety from massive manpower reduction	Can mitigate through communication
	Scope and focus creep	Use project milestones
	Underestimating need for communication	Focus groups, web, e-mail, newsletters
	Lack of ownership	Demonstrate value
	Technical mindset	Focus on business value
	Lack of IT preparedness	Obtain qualified IT staff
Motwani et al. (2002)	One project out of control	Careful planning
	The other project successful	Training
		Careful measurement of changed process
		Identification of business value
Sarkis and Sundarraj (2003)	Initial productivity dip	Planned for through consultant
Yusuf et al. (2004)	Matching process to software	Communication with users
	Data cleanup	Training
		Bridging legacy systems
	Training	Careful planning, focus on overall company value

Motwani et al. (2002) reported two examples of BPR. Their Company A was a pharmaceutical and nutritional manufacturer dealing with many (30,000) stock-keeping units. They had an ERP system in place, but it was not functioning well. Top management imposed an ERP upgrade of its inventory management process, also integrating inventory with accounting, production planning and materials planning. The BPR included some process mapping and diagnosis with measures of performance. However, the complexity of the upgrade was underestimated and in the first quarter immediately following the ERP upgrade, the company lost over $14 million in operational costs. A completely new storage nomenclature system was found to be necessary. Software bugs were present. The ERP system assigned bin locations for products that were erroneous and thus shipping was ineffective and customer service reached a new low.

Motwani et al.'s Company B was a designer, manufacturer and marketer of footwear, distributing worldwide in 134 markets through licensees and distributors. Their legacy system was very slow, often requiring up to 8 hours to obtain basic information about orders or inventory availability. A new ERP was designed through BPR and implemented in a phased operation. There were high levels of employee involvement and adequate time was carefully allowed. The BPR was accompanied by careful measurement of changed processes, with identification of business value.

Motwani et al. compared these two cases, one unsuccessful and the other successful. The primary difference identified was that the unsuccessful implementation was hurried, imposed from the top and did not include sufficient training. A particular problem was that those who were trained lacked the required computer skills. The successful firm, operating internationally, took a more formal approach, carefully measuring the impact at

each phase and redefining the project when necessary. This was a case where a bureaucratic approach worked better than a less rigid system.

The Texas Instruments BPR analysis (Sarkis and Sundarraj, 2003) was massive, covering the entire organisation, with the intent of making processes uniform throughout the organisation's worldwide supply chain. The ERP system that evolved replaced thousands of IS programmes. The BPR was effective in reducing purchase order approval from a worst of 15 levels of approval to four for all cases. Texas Instruments' strategy was to minimise customisation. No modification of the SAP system was allowed without thorough justification. This application of BPR was considered a success. Response time with the new system was within 3 seconds, 90% of the time, supporting 300–1,700 users simultaneously. The system supported the entire supply chain, including 10,000 Texas Instruments users and an additional 3000 in the supply chain. There was an initial productivity dip (planned for by Texas Instruments and its consultants), due to learning-curve effects. There were some cases where on-time delivery targets were not met, many due to market conditions (unexpected increase in demand).

The Rolls-Royce BPR (Yusuf et al., 2004) covered facilities in 14 countries. The prior system consisted of over 1500 legacy software programs, independent for the most part, with many inaccurate and inconsistent results. The BPR exercise undertaken at Rolls-Royce included the following elements:

- map current processes
- identify problems or issues
- select best practice from SAP
- remap or modify processes to match SAP.

A concerted effort was made to avoid customisation of the SAP's aerospace and defence industry solution. Over 6000 SAP licenses were obtained by Rolls-Royce.

Rolls-Royce emphasised training. To maximise cooperation, organised seminars were presented to demonstrate the value of the ERP system, focusing on the value of the system to the company as a whole. The SAP specialists trained specialist users, focusing on technical issues. These specialists in turn trained expert end-users in different countries, whose training was completed by consultants.

Multinational implementations of ERP in different countries complicate BPR due to:

- the need to reflect different costs of doing things may change best practices in the country
- different legacy practices across countries
- additional constraints may be imposed on BPR due to varying regulations
- there may be cultural resistance to change
- there may be variance in user computer experience.

The BPR offers a great deal of opportunity to improve methods. In multinational ERP implementations, each subsidiary faces unique conditions, complicating the process.

4.2 Federalism and customisation

The reasons to avoid customisation are emphasised in the following quotations (Millman, 2004):

> "Taking a firm line on customisation is one of the most effective ways to control ERP cost and maximise value" (Ken Stoll, partner, Accenture).
>
> "Dow, one of the first adopters of SAP, customised extensively and held off upgrading. The SAP is discontinuing support and Dow faces a difficult decision." (Paul Janicki, global finance director, Dow Chemical Co.).

Customisation of vendor software is very risky, due to continuous vendor efforts to improve software (and dropping support from older versions). However, multinational ERP systems need to serve many diverse reporting needs. One of the ideas about multinational ERP implementation responding to these diverse needs is federalism.

Davenport (1998) argued that a federalist structure, (where different elements of the organisation had their own versions of an ERP system linked together at a high level) was a way to cultivate unique competitive advantages. In this approach, regional units tailor their operations to local requirements and regulatory structure. Federalist structure is attractive for multinational organisations and in fact has been put into effect at Monsanto, Hewlett-Packard, and Nescafe.

Federalism is an attractive way to approach ERP implementation in multinational operations because it provides the flexibility to cope with local needs, while operating within an overall unified framework. However, federalism imposes customisation to meet these local needs, which is usually unattractive from the perspectives of cost and schedule risk.

4.3 Supply chain aspects

Multinational ERP systems often exist to support supply chain activities, usually through web linkage, allowing electronic data interchange. Early examples of such systems were Siemens and Lucent, who adopted SAP R/3 in the 1990s with the primary purpose of improving the integrity of support to their supply chains (Elliott, 1997). In the Texas Instruments case cited by Sarkis and Sundarraj (2003), web ability was a key factor in the system. Over 70% of Texas Instruments' external transactions were conducted electronically. Customer order costs were reduced and they had access to real-time global information. The Rolls-Royce integration of supply chain activities was also a major factor in their ERP system design (Yusuf et al., 2004).

The ERP systems can provide very effective supply chain support. Ash and Burn (2003) reported on e-business integration in 10 SAP R/3 customers in Australia in 1999. These firms were involved in 16 major electronic ERP projects. The reason for these organisations adopting SAP included supply chain factors in addition to product development and customer service issues. Six firms were traced in a longitudinal study over 18 months, including B2B, B2C and B2E linkages. All of these projects were reported to be successfully implemented.

Goutsos and Karacapilidis (2004) reported an open supply chain management system for a medium-sized textile firm in Greece that needed electronic linkage to customers and suppliers. This organisation's preexisting ERP system had been in operation for seven years, but market and business changes led the company to invest heavily in a more

efficient system. Benefits of the Greek system included improvement of buyer–supplier relationships due to earlier supplier involvement in a win-win partnership, reduction of production costs through resource and work synchronisation and balancing of acquisition and carrying costs in inventory management.

Multinational ERP implementation for global supply chain operation demands a great variety of information that must be collected across countries, suppliers and partners. This information includes costs of raw materials, costs of transporting raw materials, reliability of telecommunications, ports, roads and airports, definitions and terms of supply chain components, exchange rates, tax structures and shop floor regulations, etc. (Prasad and Sounderpandian, 2003). The design of a supporting information system has historically been difficult, given such diversity and flux of information. These difficulties led to limiting electronic data interchange (EDI) connection to local suppliers only. However, internet connectivity could overcome some of these difficulties and web linkage to ERP systems is starting to provide standardised platforms for data transfer and sharing, among firms in different countries.

Multinational operations are naturally tied to supply chain operations (although not all multinational operations have to be supply chain related).

- Multinational operations involving supply chains gain from electronic data interchange and internet connectivity.
- Supply chain systems cross organisations, thus incurring security risks. However, existing technology has been developed to cope with most, if not all, open ERP security risks.

4.4 Outsourcing in multinational operations

"For smaller companies, the only way to reap the fruits of globalisation may be through outsourcing" (Paul Janicki, Global Finance Director, Dow Chemical Co., quoted by Millman, 2004). Two of the basic cases reviewed above involved outsourcing operations in multinational organisations. In the Texas Instruments case (Sarkis and Sundarraj, 2003), Andersen Consulting was the ERP service provider and thus Texas Instruments in effect outsourced their ERP to Andersen. About 250 Texas Instruments IT personnel were transferred to Andersen. Rolls-Royce (Yusuf et al., 2004) also in effect outsourced its IT department to EDS, which became responsible for Rolls-Royce's IT development. This allowed Rolls-Royce to focus on the making and selling of aero engines, its competitive core competence.

If large multinational organisations can benefit from outsourcing ERP, smaller organisations have even greater pressure to consider this source. Beulen and Ribbers (2003) reported on outsourcing in Asian discrete manufacturing. A locally managed Asian subsidiary of a European company undertook five-year outsourcing contracts in 1998. This company's assembly and testing function operated in plants in three countries, all with lower wage costs. Outsourcing was undertaken in only one of these countries. The reason for outsourcing was lack of experience in client/server systems, which were viewed as more appropriate for its operations. The client company transferred 17 of its IT employees to the services supplier. The client company retained about eight IT personnel to focus on IT strategy and functional specifications. The firm's IT director was physically transferred from Western Europe to oversee business process reengineering. Many of the other IT employees retained by the client company worked

virtually, without problems. The IT services supplier provided full service ERP access through a regional data centre. Problems encountered in this case focused on cultural problems (lack of IT sophistication in the low-wage work force). The system was still credited with significantly improving the firm's competitive position.

Huin (2004) reported that more small to medium-sized enterprises in Southeast Asia were involved in supply chain operations. More of these firms were outsourcing their ERP, for the obvious reason that the heavy investment was too risky for them to undertake themselves. Such organisations were often required to purchase from approved vendor lists by the core firms in their supply chain and most had to use customer document formats.

Multinational firms have opportunities to outsource.

- large firms have their own technical expertise, but may benefit locally if particular labour skills are not readily available
- outsourcing provides a way for smaller multinational participants to gain access to ERP expertise.

5 Issues in multinational ERP

In addition to the four technical issues covered in Section 3, the cases reviewed uncover a number of more general issues in the implementation of enterprise systems. Sheu et al. (2004) reviewed four multinational ERP implementations, identifying national differences in four categories as shown in Table 3.

Table 3 National differences

Category	*Impact on ERP Implementation*	*Supporting Cases*
Culture/language	Localised implementations	Federalism
	Data entry	Lack of IT preparedness*
		Careful involvement**
	Cultural resistance	Need for communication underestimated*
	Language barriers to communication	
Management style	Big bang vs. phased	Scope and focus creep led to late project*
	Project duration	
Political	Information hiding	System viewed as imposed by host***
	Mistrust between host and subsidiaries	
Labour skills	Lack of personnel locally	Fear of layoffs*
	Alteration of training	Technical mindset* Special considerations can alleviate****

cases: *Al-Mashari and Zaire (2000);

**Categories from Sheu et al. (2004).

Supporting Motwani et al. (2002)

***Carton and Adam (2003)

****Yusuf et al. (2004).

Source: Based on Sheu et al. (2004).

Each of these categories includes factors considered important in multinational ERP implementation. Some technical impacts, such as regulatory requirements that impose particular business processes and foreign exchange volatility were also considered by Sheu et al. The ERP systems can be very helpful in dealing with these two factors, automating responses to requirements. Other factors are more within the realm of managerial discretion.

5.1 Culture/language

Cultural factors include differences in lack of IT preparedness and the related factor of data entry difficulties (Al-Mashari and Zaire, 2000). Careful bridging of legacy systems is a factor in successful multinational ERP data cleanup (Yusuf et al., 2004). Another factor is cultural resistance. Lack of ownership had a negative impact in the case given by Al-Mashari and Zaire (2000). Anxiety of job layoffs could be reduced through more effective communication. Careful, even bureaucratic, ERP implementation was reported to be more successful by Motwani et al. (2002). Careful management of training risk in a multinational oil company's ERP installation (Tatsiopoulos et al., 2003) was accomplished by,

- a series of workshops presented to stakeholders
- strategic analysis of risks
- management of low-level risks through assignment of responsibility to specific project activities
- feedback from risk development to management.

Reimers (2003) studied 61 cases of SAP R/3 implementations in China. Many of these implementations involved international linkages (57% were for organisations controlled by foreign entities, another 33% included foreign equity). Cultural differences were noted. State-owned companies were more likely to be interested in improved managerial control and lowered costs, especially through the use of international best practices. State-owned companies also had more problems in integrating data, as employees identified with departments rather than the entire firm. Managers in traditional Chinese firms had less trust in data quality and took more actions to verify data. There were distinct differences in top management participation, with high levels in foreign-controlled organisations and low participation in state-owned firms. Lower state-owned participation was attributed to a different attitude towards the role of leadership. Foreign-controlled companies hired more consultants. Those organisations using centralised decision making suffered longer delays.

5.2 Management style

The 'big bang' approach is a less expensive way to implement ERP (if everything goes right). This approach was successfully adopted by the multinational oil case (Tatsiopoulos et al, 2003) through careful preparation. Multinationals, however, should seriously consider the more conservative approach of rolling out ERP systems in phases, to reduce risks in this more complicated environment. Reimers (2003) reported that

implementations without foreign involvement ran their legacy systems in parallel for longer periods.

5.3 Political factors

Multinational structure can lead to additional reasons for inter-organisational differentiation. This can lead to mistrust within the organisation, reflected by behaviour such as information hiding to retain local power. Carton and Adam (2003) reported how Irish firms coped with systems imposed from above. This can be a factor in inducing resistance in the name of local autonomy, as well as the desire to retain control over data (which ERP systems naturally centralise).

5.4 Labour skills

Fear of layoffs was identified as a major problem in multinational ERP implementation, by Al-Mashari and Zaire (2000). In the study of Chinese firms (Reimers, 2003), the best predictor of project success in both cost and schedule was job security. Concern over job loss was associated with poorer project performance, attributed to greater resistance to the project. While this factor has not often been considered a critical success factor in IT project success, such resistance has been found in many other studies (for instance, Fowler and Walsh (1999) for IT projects in general; Ehrhart (2001) for FoxMeyer Drug's ERP).

Training considerations are the key to ERP implementation success. Different subsidiaries within a multinational organisation may have different technical mindsets (Al-Mashari and Zaire, 2000) leading to complications in changing the way in which workers operate within an ERP. Tatsiopoulos et al. (2003) and Yusuf et al. (2004) reported cases where special consideration of training needs led to greater implementation success. An additional factor found to be an important lesson learned, is the need for business cases.

5.5 Need for business cases

"The value isn't in the system, but in what you change" (Brian Zrimsek, the Gartner Group, quoted in Millman, 2004). A sound business case seems sensible for undertakings as large as enterprise systems. However, surveys in manufacturing (Mabert et al., 2001; Olhager and Selldin, 2003) have found that formal financial methods are often not used. This is due in great part to the unreliability of cost data, as well as the unpredictable nature of expected benefits in terms of specific savings or revenue generation.

Of the multinational enterprise studies, Al-Mashari and Zairi (2000) reported that a business case was lacking. Sarkis and Sundarraj (2003) reported that Texas Instruments did undertake a business case, but took care to include both tangible and intangible factors. The $250 million enterprise systems implementation expected to gain 3–5% improvement in firm output, but was also adopted due to the intangible factors of providing web access to their supply chain, consolidation of many independent information system programs and improved inventory accuracy. This approach of combining tangible business cases with intangible benefits seems highly appropriate for enterprise systems.

6 Conclusions

With ever-increasing economic globalisation, multinational enterprise systems are emerging as an important area of study within information systems. In part, the growth of multinational systems comes from the expansion of supply chain linkages to previously separate economies such as China. Such systems are important due to the opportunities they provide to improve business processes, to link supply chains, and to gain efficiencies from the specialisation provided by outsourcing opportunities.

Business process reengineering is an important means for ERP systems to provide efficiency to adopting organisations. The BPR is complicated in multinational and supply chain ERP systems due to the increased probability that best practices will vary across countries (in part due to different costs of inputs), as well as different legacy practices, different regulations and different culture. Since each subsidiary of a multinational firm faces unique reporting requirements, Business process reengineering should reflect these local needs. Federalism is a way to integrate locally unique ERP systems into an integrated whole. However, this requires customisation that can cause difficulties in the way of expensive customisation. Business cases for multinational organisations need to consider this tradeoff.

Multinational organisations benefit from supply chain support. Supply chain linkages induce a need for many small organisations to acquire ERP support (often constrained to match systems of the core supply chain firm). Outsourcing (through application service providers) is an attractive way for small to medium-sized enterprises to acquire ERP functionality.

Multinational enterprise systems need to consider additional cultural factors. While the benefits of enterprise systems are often universal, there are important differences in cultural views of labour relations, in labour skill sets and important differences in business regulation (Sheu et al., 2004). Failure to recognise the impact of national differences on multinational ERP implementation can be very costly.

Factors critical to the successful implementation of any enterprise system have some universal characteristics. Top management support is necessary, or project resources are not likely to be available. Sound project organisation, to include qualified project leadership and competent implementation staff are important. It also is necessary to inform organisational employees of how the system can help them to do their jobs better. Some of these employees are likely to need to find other employment, as job reduction is usually a key element in ERP cost reduction. Almost all retained employees are going to find their jobs changed. People are naturally resistant to change, and it is not that easy to implement a system within an organisation without some cooperation. Usually organisations suffer at least a year of declining productivity when enterprise systems are adopted, due in most part to this radical change in the way in which people do their work. The studies reviewed indicate that greater training and care to inform the existing work force seem to have better results in the long run. Finally, sound business cases that do not rely too much on inaccurate cost data and that consider intangible factors and trade-offs, are needed.

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