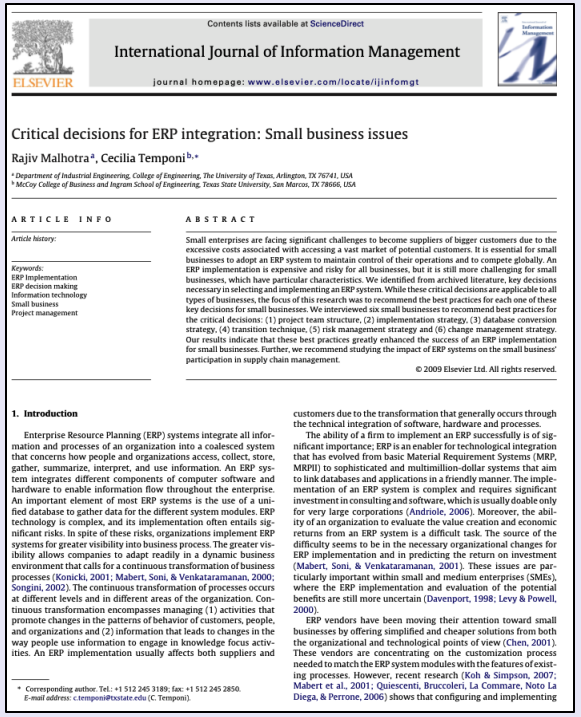
723G79/80
Theme 3: ERP Implementation

Brenda Nansubuga

LINKÖPING UNIVERSITY

Theme 3 literature

Malhotra & Temponi 2010
Describe the implementation mix of decisions to make for ERP implementations in SMEs.



Contents lists available at ScienceDirect

International Journal of Information Management

journal homepage: www.elsevier.com/locate/ijinfomgt

Critical decisions for ERP integration: Small business issues

Rajiv Malhotra[a], Cecilia Temponi[b,*]

[a] Department of Industrial Engineering, College of Engineering, The University of Texas, Arlington, TX 76741, USA
[b] McCoy College of Business and Ingram School of Engineering, Texas State University, San Marcos, TX 78666, USA

ARTICLE INFO

Article history:

Keywords:
ERP Implementation
ERP decision making
Information technology
Small business
Project management

ABSTRACT

Small enterprises are facing significant challenges to become suppliers of bigger customers due to the excessive costs associated with accessing a vast market of potential customers. It is essential for small businesses to adopt an ERP system to maintain control of their operations and to compete globally. An ERP implementation is expensive and risky for all businesses, but it is still more challenging for small businesses, which have particular characteristics. We identified from archived literature, key decisions necessary in selecting and implementing an ERP system. While these critical decisions are applicable to all types of businesses, the focus of this research was to recommend the best practices for each one of these key decisions for small businesses. We interviewed six small businesses to recommend best practices for the critical decisions: (1) project team structure, (2) implementation strategy, (3) database conversion strategy, (4) transition technique, (5) risk management strategy and (6) change management strategy. Our results indicate that these best practices greatly enhanced the success of an ERP implementation for small businesses. Further, we recommend studying the impact of ERP systems on the small business' participation in supply chain management.

1. Introduction

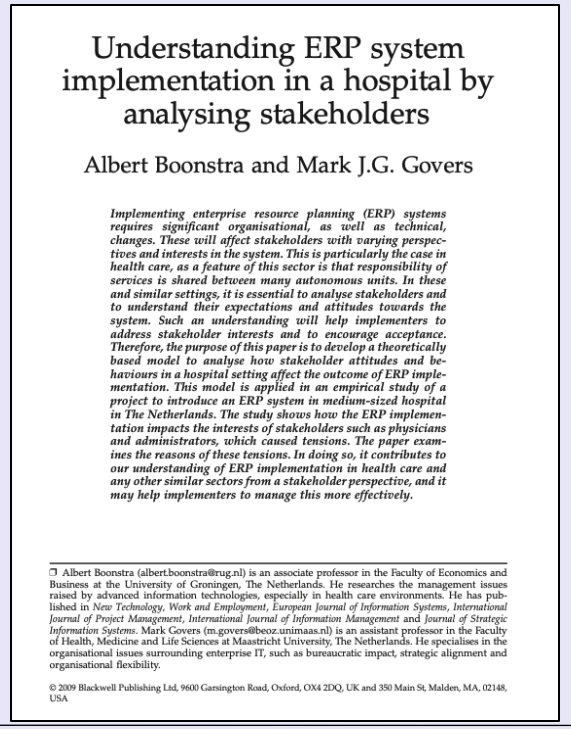
Enterprise Resource Planning (ERP) systems integrate all information and processes of an organization into a coalesced system that concerns how people and organizations access, collect, store, gather, summarize, interpret, and use information. An ERP system integrates different components of computer software and hardware to enable information flow throughout the enterprise. An important element of most ERP systems is the use of a unified database to gather data for the different system modules. ERP technology is complex, and its implementation often entails significant risks. In spite of these risks, organizations implement ERP systems for greater visibility into business process. The greater visibility allows companies to adapt readily in a dynamic business environment that calls for a continuous transformation of business processes (Konicki, 2001; Mabert, Soni, & Venkataramanan, 2000; Songini, 2002). The continuous transformation of processes occurs at different levels and in different areas of the organization. Continuous transformation encompasses managing (1) activities that promote changes in the patterns of behavior of customers, people, and organizations and (2) information that leads to changes in the way people use information to engage in knowledge focus activities. An ERP implementation usually affects both suppliers and customers due to the transformation that generally occurs through the technical integration of software, hardware and processes.

The ability of a firm to implement an ERP successfully is of significant importance; ERP is an enabler for technological integration that has evolved from basic Material Requirement Systems (MRP, MRPII) to sophisticated and multimillion-dollar systems that aim to link databases and applications in a friendly manner. The implementation of an ERP system is complex and requires significant investment in consulting and software, which is usually doable only for very large corporations (Andriole, 2006). Moreover, the ability of an organization to evaluate the value creation and economic returns from an ERP system is a difficult task. The source of the difficulty seems to be in the necessary organizational changes for ERP implementation and in predicting the return on investment (Mabert, Soni, & Venkataramanan, 2001). These issues are particularly important within small and medium enterprises (SMEs), where the ERP implementation and evaluation of the potential benefits are still more uncertain (Davenport, 1998; Levy & Powell, 2000).

ERP vendors have been moving their attention toward small businesses by offering simplified and cheaper solutions from both the organizational and technological points of view (Chen, 2001). These vendors are concentrating on the customization process needed to match the ERP system modules with the features of existing processes. However, recent research (Koh & Simpson, 2007; Mabert et al., 2001; Quiescenti, Bruccoleri, La Commare, Noto La Diega, & Perrone, 2006) shows that configuring and implementing

* Corresponding author. Tel.: +1 512 245 3189; fax: +1 512 245 2850.
E-mail address: c.temponi@txstate.edu (C. Temponi).

Boonstra & Govers, 2009
Shows how a hospital failed to involve relevant stakeholders during its ERP implementation.



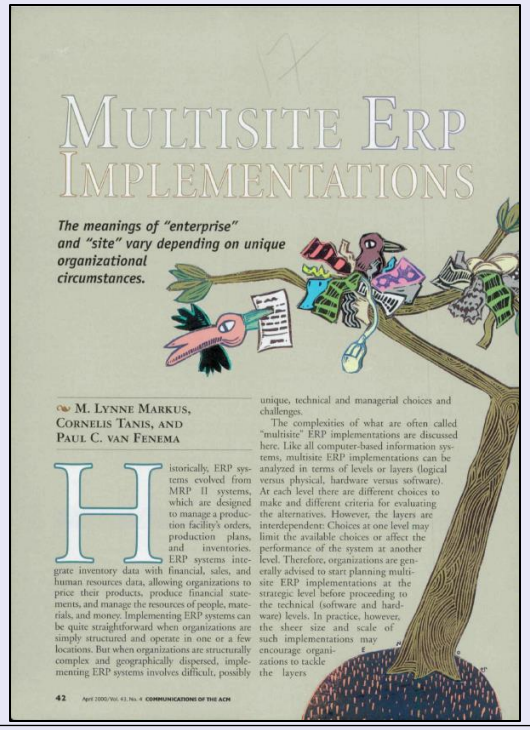
Understanding ERP system implementation in a hospital by analysing stakeholders

Albert Boonstra and Mark J.G. Govers

Implementing enterprise resource planning (ERP) systems requires significant organisational, as well as technical, changes. These will affect stakeholders with varying perspectives and interests in the system. This is particularly the case in health care, as a feature of this sector is that responsibility of services is shared between many autonomous units. In these and similar settings, it is essential to analyse stakeholders and to understand their expectations and attitudes towards the system. Such an understanding will help implementers to address stakeholder interests and to encourage acceptance. Therefore, the purpose of this paper is to develop a theoretically based model to analyse how stakeholder attitudes and behaviours in a hospital setting affect the outcome of ERP implementation. This model is applied in an empirical study of a project to introduce an ERP system in medium-sized hospital in The Netherlands. The study shows how the ERP implementation impacts the interests of stakeholders such as physicians and administrators, which caused tensions. The paper examines the reasons of these tensions. In doing so, it contributes to our understanding of ERP implementation in health care and any other similar sectors from a stakeholder perspective, and it may help implementers to manage this more effectively.

❒ Albert Boonstra (albert.boonstra@rug.nl) is an associate professor in the Faculty of Economics and Business at the University of Groningen, The Netherlands. He researches the management issues raised by advanced information technologies, especially in health care environments. He has published in *New Technology, Work and Employment*, *European Journal of Information Systems*, *International Journal of Project Management*, *International Journal of Information Management* and *Journal of Strategic Information Systems*. Mark Govers (m.govers@beoz.unimaas.nl) is an assistant professor in the Faculty of Health, Medicine and Life Sciences at Maastricht University, The Netherlands. He specialises in the organisational issues surrounding enterprise IT, such as bureaucratic impact, strategic alignment and organisational flexibility.

Markus et al., 2020
Highlights key issues when dealing with implementations of ERP systems at multiple sites.



MULTISITE ERP IMPLEMENTATIONS

The meanings of "enterprise" and "site" vary depending on unique organizational circumstances.

M. LYNNE MARKUS, CORNELIS TANIS, AND PAUL C. van FENEMA

Historically, ERP systems evolved from MRP II systems, which are designed to manage a production facility's orders, production plans, and inventories. ERP systems integrate inventory data with financial, sales, and human resources data, allowing organizations to price their products, produce financial statements, and manage the resources of people, materials, and money. Implementing ERP systems can be quite straightforward when organizations are simply structured and operate in one or a few locations. But when organizations are structurally complex and geographically dispersed, implementing ERP systems involves difficult, possibly unique, technical and managerial choices and challenges.

The complexities of what are often called "multisite" ERP implementations are discussed here. Like all computer-based information systems, multisite ERP implementations can be analyzed in terms of levels or layers (logical versus physical, hardware versus software). At each level there are different choices to make and different criteria for evaluating the alternatives. However, the layers are interdependent: Choices at one level may limit the available choices or affect the performance of the system at another level. Therefore, organizations are generally advised to start planning multisite ERP implementations at the strategic level before proceeding to the technical (software and hardware) levels. In practice, however, the sheer size and scale of such implementations may encourage organizations to tackle the layers

ERP Implementation

Implementation is about setting up an organization's process in the ERP system.

- ERP adaptation involves customizing the ERP system to align with the organization's business processes rather than its underlying business logic.

This customization retains the organization's unique processes, but it also increases the cost and complexity of the ERP system.

- Process adaptation refers to adapting the organization's business processes to fit the business logic of the ERP system.

While process adaptation can be a cost-effective solution, it's important to note that it can also have significant implications for an organization's performance and competitiveness. This underscores the complex trade-offs that decision-makers must navigate

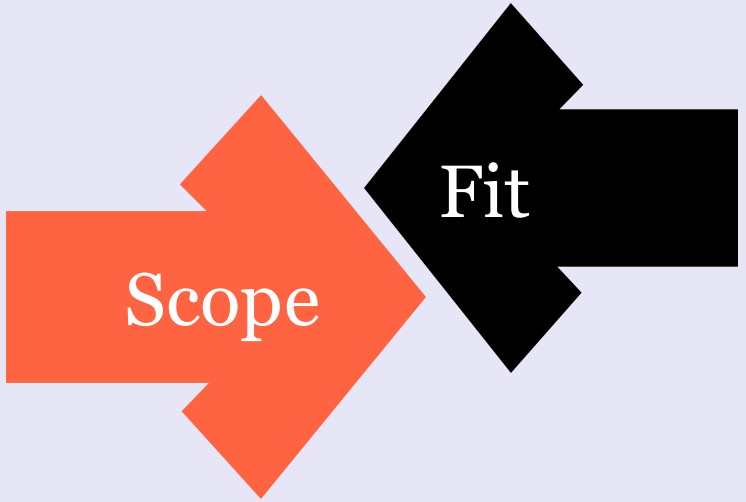
In practice, most organizations must find a balance between these two adaptation processes. This balance is not just a matter of preference but a strategic necessity for maintaining operational efficiency and competitiveness.

Source: Hong & Kim, 2002

Scope and Fit during ERP implementation

Two important factors to consider when implementing a new ERP are the scope and fit

-Defines the extent and type of benefits to be derived
-Specifies the degree to which the ERP system will impact managerial autonomy, etc
-A large scope is likely to entail project management difficulties and higher costs



It is crucial to align the interests between vendors and customers. Vendors tend to prefer generic solutions, while customers prefer tailor-made solutions.

Sources: Hong & Kim, 2002
Markus et al., 2000

Discussion

What are some common challenges associated with ERP implementation?

ERP implementation risks

- ERPs can deliver great rewards, but their technology is complex, and its implementation often entails significant risks.
- ERP implementation failure may be fatal to a firm, causing it to waste large sums of money or destroy its competitive advantage.

Source: Hong & Kim, 2002
Malhotra & Temponi, 2010

Risk of failure

High risk of failure with ERP implementations

- Many firms fail in their first ERP implementation.
- ERP systems often fall short on data accuracy, user experience, and analytics.
- Failure can also be due to poor selection, lack of strategic thinking, poor change management, and insufficient training.

Sources: Grabski et al 2011
Malhotra & Temponi, 2010
https://www.netsuite.com/portal/resource/articles/erp/erp-statistics.shtml

Risk of overspending

Overspending is a common implementation project issue.

- Most implementations cost 3–4 times more than the initial budget.
- System modifications needed to improve usability often cause overspending.
- The implementation period often takes longer than anticipated.
- ERP implementation requires significant investment in consulting and software, which is usually doable only for very large corporations.
- Many small businesses lack sufficient resources or are unwilling to commit a significant fraction of their resources due to the long ERP implementation times and high fees.

Sources: Grabski et al 2011
Malhotra & Temponi, 2010
https://www.netsuite.com/portal/resource/articles/erp/erp-statistics.shtml

Disruption of business processes

Implementation can disrupt business processes.

- ERP implementations alter the operational structure and business processes.
- An ERP implementation usually affects both suppliers and customers due to the transformation that occurs through the technical integration of software and hardware.
- 51% of firms experience operational disruptions when they go live.
- The two most commonly cited challenges during implementation are insufficient testing and not enough process reengineering.

Sources: Grabski et al 2011
Malhotra & Temponi, 2010
https://www.netsuite.com/portal/resource/articles/erp/erp-statistics.shtml

Critical decisions in ERP implementation

Create the project team structure.

Decide between manual and electronic data conversion strategies from the old ERP to the new one.

Formulate clear objectives for the implementation.

Categorize the possible risks that might accompany the implementation process and devise a mitigation plan.

Articulate the transition technique to be employed when moving from the old ERP to the new one.

Facilitate change management among staff through training, to foster acceptance of the new ERP.

Source: Malhotra & Temponi 2010

Team structures

Description	Advantages	Disadvantages
Isolated function: Participants from each functional area are responsible for their own implementation and use of the software.	They have the most knowledge about their business processes, and will be very knowledgeable end-users later	There is no centralized organization coordinating and synchronizing the ERP system of implementation
Lightweight: Functional managers, lead persons, and a lightweight project manager with limited direct authority over project members	Improved cross-functional communication through regular project team meetings.	Conflicts are common, and it takes a long time to resolve issues as several participants must reach an agreement.
Heavyweight: A senior manager has direct authority and control over the ERP project team.	Straightforward communication gives a clear sense of direction.	Difficult to use as the size and complexity of the ERP implementation increases.
A-Team: Similar to the heavyweight structure; a senior manager manages the project team (+ all the functional managers are full time members of the ERP team	Team members have complete authority to make most of the decisions	As decisions can be made by the core team without the need to communicate with other team members there may disparity between the functionality of the ERP and the end users' expectations

Source: Malhotra & Temponi, 2010

Implementation strategies

Description	Advantages	Disadvantages
Breakneck: Implement an ERP solution on a low budget very rapidly	The company has a quick solution if the strategy works	A very high-risk approach that rarely works
Star: Senior manager in charge and dedicated team members	The implementation usually results faster and cheaper	Full time resources are needed
Turnkey: Subcontract to ERP system integrators and providers all ERP implementation activities.	The implementation is done by experienced people. No internal resources are needed.	The configured product does not match business needs.
In-house: Use only internal resources to implement the ERP system	The strategy generates cost savings coupled with internal ownership	An inexperienced team requires a long time for implementation.>> Expensive.
Budget: Cost-cutting by limiting the ERP project scope and eliminating consultants	There is a perception that this approach is cheaper	Lack of senior management support >> Lack of user interest on the project.
Partner: Split the responsibility between internal and external resources	Partners complement the strength of the internal team	Longer implementation due to conflicts between the supply chain partners
Low risk: High level of resources with low complexity and relax milestones to minimize project risk	High probability of success	Implementation takes a long time

Source: Malhotra & Temponi, 2010

ERP transition techniques

Description	Advantages	Disadvantages
Big Bang: All the functional modules of the new system go live at the same time the legacy system is taken offline..	- Costs are reduced since no interface programs are required. - Decision-making is simplified.	- The go live event requires extensive support. - High failure rates are common.
Phased: One functional module at a time.	The resources needed at any given time are low.	- Additional technical resources are required to develop interface programs to keep both of the ERP systems functional. - The transition takes a long time.
Parallel: Both the legacy and the new ERP systems operate in parallel for a certain length of time.	Good recovery options are available if anything goes wrong with the new system.	Considerable more resources are consumed as two ERP systems must be maintained in parallel.
Process line: The new ERP system is implemented in big bang fashion but only one process line at a time.	The experience gained from doing one process line at the time benefits the next implementation.	Maintaining communication on both process lines, the legacy and the new system respectively adds complexity

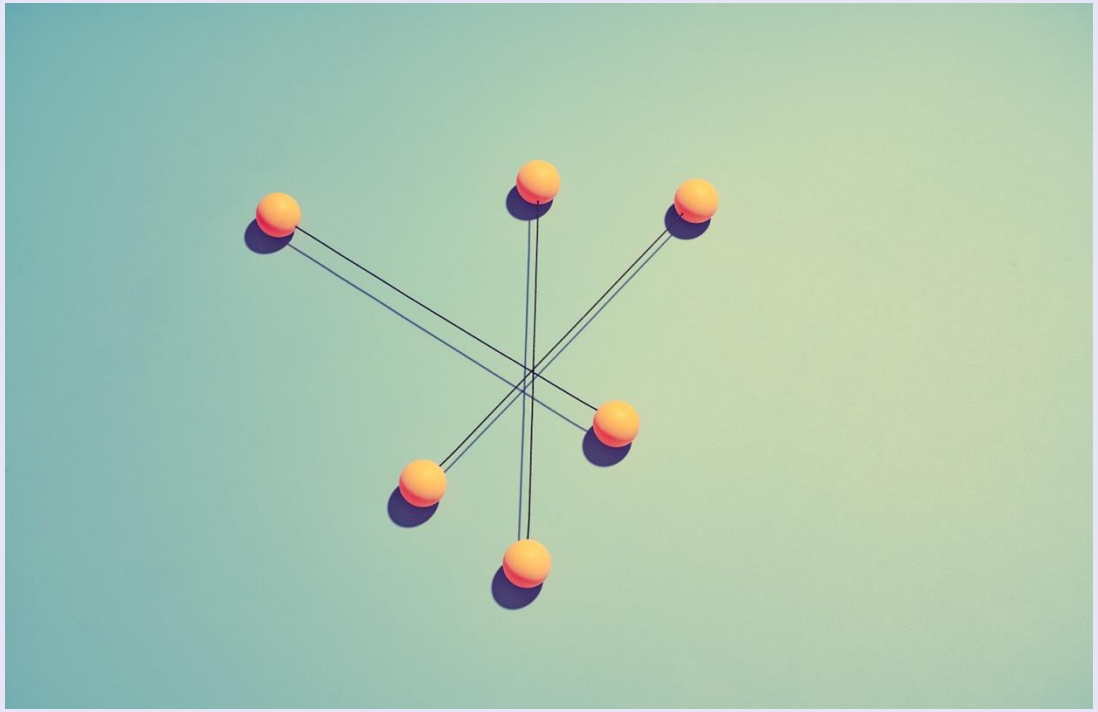
Source: Malhotra & Temponi, 2010

Implementation in multi-site organizations

Implementing ERP systems can be straightforward when organizations are simply structured and operate in one or a few locations. But when organizations are structurally complex and geographically dispersed, it involves difficult, possibly unique, technical and managerial choices and challenges.

Source: Markus et al., 2000

Total local autonomy



Subdivisions are allowed to independently choose their own ERP.

(+) Avoids the conflict associated with changes in headquarters-business unit relationships.

(+) Allows companies to pursue future acquisitions and divestitures free of systems complications.

(+) Reduces the risk of implementation project failure.

(-) Fails to capture the potential of ERP systems to integrate data, systems, and processes across locations and business units

Source: Markus et al., 2000

HQ control only at the financial level

Subdivisions are allowed to choose their own ERP, with the exception of financial accounting and reporting.

(+) Effective when the units do very different things.

(+) Reduces the risk of project implementation failure.

(-) Fails to capture the potential of ERP systems to integrate data, systems, and processes across locations and business units

Source: Markus et al., 2000

HQ coordinates operations

Subdivisions are allowed to choose their own ERP with the exception of the supply chain, e.g., procurement, inventory, and production schedules.

- Works best when there are potential corporate benefits from common purchasing.
- Best when there are global as well as regional customers.
- Headquarters must play a major role in chartering and managing the ERP implementation project.

Source: Markus et al., 2000

Network coordinates operations

- Local operations have access to each other's information
- Most useful when the entities sell to each other as well as to external customers.
- ERP implementation projects designed to achieve this level of integration require extensive cooperation between headquarters and the business units.

Source: Markus et al., 2000

Total centralization

All decisions are made centrally and communicated to local operations for execution.

Most useful when companies need to present a single global “face” to their customers worldwide.

Such ERP implementations take longer to implement and are likely to fail more often.

Source: Markus et al., 2000

Implementation in small vs large firms

	Small and medium firms	Large firms
Scope of use	• Single location • Few specialized functions	• Multiple locations • Multiple functions
Implementation period	Short	Long
Cost of implementation	Low	High
Products and market	Often specialized and niche, requiring focused ERP	Anything from specialized/niche to portfolio/mass market
Competitive advantage expectation	Adaptability and flexibility	Size and stability
Information sharing	Informal between units	Centralized or decentralized models
Support requirements	High need for top management support	High need for strategic advantages and linkages to global activities

Source: Malhotra & Temponi 2010
Grabski et al., 2011

Before implementing an ERP, firms should ask themselves the following questions

Sources: Hong & Kim, 2002
Markus et al., 2000

References

- Avison, D., & Malaurent, J. (2007). Impact of cultural differences: A case study of ERP introduction in China. *International journal of Information management*, *27*(5), 368-374.
- Grabski, S. V., Leech, S. A. & Schmidt, P. J. (2011). A Review of ERP Research: A Future Agenda for Accounting Information Systems. *Journal of Information Systems*, Vol. 25, No. 1, pp. 37-78.
- Hong, K. K., & Kim, Y. G. (2002). The Critical Success Factors for ERP Implementation: An Organizational Fit Perspective. *Information & Management*, Vol. 40, No. 1, pp. 25-40.
- Malhotra, R. and Temponi, C. (2010) 'Critical decisions for ERP integration: Small business issues', *International Journal of Information Management*, 30, pp. 28–37.
- Markus, M. L., Tanis, C. & van Fenema, P. C. (2000). Multisite ERP implementations. *Communications of the ACM*, Vol. 43, No. 4, pp. 42-46.

Thank you!

Brenda.Nansubuga@liu.se

LINKÖPING UNIVERSITY