



CHILDREN AND FAMILIES
EDUCATION AND THE ARTS
ENERGY AND ENVIRONMENT
HEALTH AND HEALTH CARE
INFRASTRUCTURE AND
TRANSPORTATION
INTERNATIONAL AFFAIRS
LAW AND BUSINESS
NATIONAL SECURITY
POPULATION AND AGING
PUBLIC SAFETY
SCIENCE AND TECHNOLOGY
TERRORISM AND
HOMELAND SECURITY

The RAND Corporation is a nonprofit institution that helps improve policy and decisionmaking through research and analysis.

This electronic document was made available from www.rand.org as a public service of the RAND Corporation.

Skip all front matter: [Jump to Page 1](#) ▼

Support RAND

[Purchase this document](#)

[Browse Reports & Bookstore](#)

[Make a charitable contribution](#)

For More Information

Visit RAND at www.rand.org

Explore the [RAND Corporation](#)

View [document details](#)

Limited Electronic Distribution Rights

This document and trademark(s) contained herein are protected by law as indicated in a notice appearing later in this work. This electronic representation of RAND intellectual property is provided for non-commercial use only. Unauthorized posting of RAND electronic documents to a non-RAND website is prohibited. RAND electronic documents are protected under copyright law. Permission is required from RAND to reproduce, or reuse in another form, any of our research documents for commercial use. For information on reprint and linking permissions, please see [RAND Permissions](#).

This report is part of the RAND Corporation research report series. RAND reports present research findings and objective analysis that address the challenges facing the public and private sectors. All RAND reports undergo rigorous peer review to ensure high standards for research quality and objectivity.

Improving Air Force Enterprise Resource Planning-Enabled Business Transformation

Jessie Riposo, Guy Weichenberg, Chelsea Kaihoi Duran, Bernard Fox,
William Shelton, Andreas Thorsen

RAND Project AIR FORCE

Prepared for the United States Air Force
Approved for public release; distribution unlimited



The research described in this report was sponsored by the United States Air Force under Contract FA7014-06-C-0001. Further information may be obtained from the Strategic Planning Division, Directorate of Plans, Hq USAF.

Library of Congress Cataloging-in-Publication Data

Riposo, Jessie.

Improving Air Force enterprise resource planning-enabled business transformation / Jessie Riposo, Guy Weichenberg, Chelsea Kaihoi Duran, Bernard Fox, William Shelton, Andreas Thorsen.

pages cm

Includes bibliographical references.

ISBN 978-0-8330-8038-7 (pbk. : alk. paper)

1. United States. Air Force—Accounting. 2. United States. Air Force—Management. 3. United States. Air Force—Information technology. 4. United States. Air Force—Data processing. 5. Business logistics—United States. 6. Reengineering (Management)—United States. I. Title. II. Title: Improving Air Force ERP-enabled business transformation.

UG633.2.R57 2013

358.4'16880973—dc23

2013030449

The RAND Corporation is a nonprofit institution that helps improve policy and decisionmaking through research and analysis. RAND's publications do not necessarily reflect the opinions of its research clients and sponsors.

Support RAND—make a tax-deductible charitable contribution at www.rand.org/giving/contribute.html

RAND® is a registered trademark.

© Copyright 2013 RAND Corporation

This document and trademark(s) contained herein are protected by law. This representation of RAND intellectual property is provided for noncommercial use only. Unauthorized posting of RAND documents to a non-RAND website is prohibited. RAND documents are protected under copyright law. Permission is given to duplicate this document for personal use only, as long as it is unaltered and complete. Permission is required from RAND to reproduce, or reuse in another form, any of our research documents for commercial use. For information on reprint and linking permissions, please see the RAND permissions page (www.rand.org/pubs/permissions.html).

RAND OFFICES

SANTA MONICA, CA • WASHINGTON, DC

PITTSBURGH, PA • NEW ORLEANS, LA • JACKSON, MS • BOSTON, MA

DOHA, QA • CAMBRIDGE, UK • BRUSSELS, BE

www.rand.org

Summary

Information technology (IT) has come to play an increasingly significant role in the way organizations conduct business, evolving from a narrow tool for automation to a potential enabler of business transformation.¹ Enterprise Resource Planning (ERP) systems are prime examples of IT systems being pursued by the Department of Defense (DoD) to enable transformation and improve efficiency and effectiveness. ERP systems are configurable, commercial off-the-shelf (COTS) software packages that enable organizations to integrate operational and management processes across a broad range of internal business activities. The DoD and the military services have implemented or are in the process of implementing several ERP systems to enable business transformation goals and meet the fiscal year (FY) 2017 deadline for auditable consolidated financial statements (Public Law 99-433, 2010). The Air Force is implementing two such systems, the Air Force Integrated Personnel and Pay System (AF-IPPS) and the Defense Enterprise Accounting and Management System (DEAMS), and recently canceled a third, Expeditionary Combat Support System (ECSS). These ERPs were initiated with the intent of improving the effectiveness of the Air Force's business functions and providing operational support to the warfighter (e.g., through improved visibility and management of personnel and other assets). Importantly, especially in an era of constrained budgets, these ERPs were also intended to reduce the cost of Air Force business functions, which compete with operations and modernization for funds.

Implementing an ERP system can confer a range of benefits to an organization (e.g., see Davenport, 2000; Eckartz, 2009; Shang, 2002; Staehr, 2010). ERP systems promise to integrate business functions and data throughout an organization; provide a forcing function for process transformation; standardize software and processes; reduce development costs, schedules, and risks via proven COTS products; consolidate redundant systems; retire obsolete legacy systems; and potentially simplify sustainment. However, successful implementation generally entails significant business change because ERP systems typically affect a large number of organizational departments and processes. The DoD and the private sector have experienced numerous ERP failures as a result of a misplaced focus on the enabling IT rather than emphasizing the broader business change necessary to accomplish the transformation. The scope of change needed to transform an organization is vast, and considerable attention must be given to the planning and execution of the range of activities associated with the business transformation.

The Air Force asked RAND Project AIR FORCE (PAF) to review its ERP efforts and to identify the key early planning issues associated with successful ERP programs and the ways in which early planning, or lack thereof, might affect ERP program execution. PAF was also asked

¹ Business transformation definitions vary, but the term generally refers to strategic, enterprise-wide change that has a profound impact on an organization's capabilities, environment, and performance (e.g., see Capgemini, 2012).

to recommend options for improving the Air Force’s planning and early assessments of ERP programs. Through review of relevant business literature and interviews with a broad cross-section of experts, stakeholders, and senior government leaders, PAF identified the key conditions that must be achieved to facilitate the success of ERP-enabled business transformation, the challenges the Air Force must address to achieve those conditions, and options for overcoming these challenges. Our focus on ERP programs is not meant to suggest that the Air Force or DoD should view ERP systems as a preferred business IT solution for all circumstances. In fact, as explained throughout this report, ERP systems have transformative potential but are accompanied by a range of conditions for success that can be challenging to achieve. Finally, this report is not a “lessons learned” case study analysis of troubled programs, but an analysis of steps the Air Force should take to improve the success of business transformation, of which ERP acquisition can be a part.

Conditions for Successful ERP-Enabled Business Transformation and Challenges Facing the Air Force

The research team organized the conditions for successful ERP-enabled business transformation into five categories: business case, governance, business process reengineering (BPR), organizational change management (OCM), and IT acquisition. These are not necessarily sequential categories of activities; many are done simultaneously. In each of the five areas, the team also identified challenges the Air Force must address.

Business case. The initial purpose of a business case is to justify a project’s required investment; however, business cases are also increasingly recognized as a planning and management tool to ensure that the business benefits sought are ultimately realized. An effective business case should articulate the transformational goals and desired benefits that are aligned with an enterprise business strategy. In the context of this report, an Air Force enterprise business strategy would address, at a high-level, how business operations will support the operational priorities of the Air Force. It describes the principles, goals, and objectives that are the foundation for an Air Force business enterprise architecture. It also is the framework for cross-functional decisionmaking and the adjudication of touchpoints between functionals. Additionally, it supports other higher-level strategies as required. The business case should include all associated costs, risks, and a realistic schedule. This requires a clear understanding of both the current (or “AS-IS”) environment and the target (or “TO-BE”) environment, which achieves enterprise goals. These environments include processes, the organization, and IT, and their understanding should include cost and performance.

The Air Force has struggled in meeting these conditions for success, both in articulating an enterprise-wide business strategy and understanding the complexities of the AS-IS and TO-BE business environments. This impairs its ability to carry out the analyses and activities that aid in building a solid business case.

Governance. Governance is decisionmaking to advance an organization’s goals and objectives. The governance structure and related decisionmaking criteria should be grounded in the enterprise business strategy and business case and should be as simple and responsive as

possible, with clearly defined authority and roles and responsibilities, ideally led by a single person or a small group.

The Air Force faces several challenges in achieving these conditions. These include untimely or pro forma business cases not aligned with an Air Force-wide business strategy or other functional visions; a bifurcated organizational structure, with the Secretary of the Air Force (SECAF) responsible for business and the Chief of Staff of the Air Force (CSAF) responsible for operations/command; a multitude of influential stakeholders operating within functional stovepipes; and conflicting laws, regulations, and policies.

BPR. This is defined as the radical redesign of business processes to achieve dramatic improvement in business performance (Hammer and Champy, 2003) and has been widely identified in the literature as a critical success factor for ERP implementations. BPR should drive the enterprise's processes toward achieving the benefits articulated in the business case. It may or may not be enabled by IT. For BPR to succeed, a number of elements are necessary, including leadership support and communication of the vision, goals, motivation, and importance of the BPR project to stakeholders. Senior leadership, middle management, and support staff must have sufficient knowledge of BPR, and the organizational and incentive structures must support a cooperative environment that fosters communication, confidence, and trust. Ideally, IT processes should be adaptable to minimize the need for software customization.

As noted above, the Air Force has faced a number of challenges in this area, including the lack of a clearly understood, broadly embraced strategy with respect to business transformation and the need for a better understanding of AS-IS and TO-BE processes. Indeed, due to the multifunctional and stovepiped nature of the Air Force, it is unlikely any individual has complete knowledge of any process from end to end. BPR is constrained by laws, regulations, and policies, potentially limiting opportunities to change processes in lieu of COTS customization.

OCM. This is a term used to describe an organization's efforts to garner support for changes and encourage their adoption. These efforts are key to transformation, should be well thought out, and should have clearly defined implementation strategies. Successful OCM requires active leadership support, synchronization with the business case, and employee involvement. Specific activities include stakeholder analyses, formal and informal communication, education, and training.

Air Force ERP programs have struggled to overcome organizational challenges for several reasons, including a stovepiped organizational structure and culture, frequent leadership turnover, and limited options for incentives. OCM activities are frequently mistimed or narrow in focus, and there are disincentives to full disclosure of some potential benefits of change (e.g., financial and personnel savings) because the functional owner may not reap them or control those resources.

IT acquisition. If an IT acquisition is required, the full range of potential alternatives should be evaluated against their ability to achieve the benefits stated in the business case. Should an ERP prove to be the appropriate solution, specific expertise in this technology should be assigned to the program, either organically or through independent consultants with appropriate expertise acting as trusted advisers/agents.

There is a natural tendency for any organization to focus prematurely on the candidate IT products before more fundamental considerations have been articulated and decided upon. In the case of ERPs, this is largely due to the undeniable appeal of a COTS solution that purports to provide “best of breed” functionality at lower development, training, and sustainment costs within a shorter timeframe—and supposedly all at lower risk because the system has been developed and deployed for other users. Unfortunately, realization of these benefits is far from automatic and requires substantial planning, expertise, and commitment from all stakeholders. Choosing among multiple alternative solutions requires an overarching business strategy and architecture to guide scoping decisions during planning before program execution, which has often been absent in the Air Force.²

DoD ERP programs also face some additional challenges, including constraints related to service missions, national security requirements, and the laws, regulations, and policies imposed by higher-level organizations. The successful planning and execution of ERP programs require specialized skill sets and knowledge that are not widely available, even within most commercial organizations.

What Should the Air Force Do?

This analysis provides specific recommendations for planning activities for ERP-enabled business transformation. We have grouped them in three time phases: *Pretransformation*, in which the initial conditions for transformation are established on an ongoing basis; *Transformation, Preprogram Initiation*, in which all the activities leading up to a materiel decision are performed; and *Transformation, Post-Program Initiation*, in which activities following the decision to pursue an IT acquisition are carried out.

Pretransformation. Before the transformation, the Air Force should

- promulgate and implement an Air Force enterprise business strategy and business enterprise architecture, developed by the USECAF in his/her role as the Air Force Chief Management Officer (CMO) and informed by the Vice Chief of Staff of the Air Force (VCSAF), to serve as the framework and foundation for future business transformations
- document an integrated AS-IS environment at the Air Force enterprise level (This provides the baseline for functional strategies and transformations and ensures coordination across functions leading to integrated solutions.)
- establish Air Force enterprise level governance co-chaired by the USECAF and VCSAF, using the Air Force business strategy as the foundation (Involving both the business and command/operations parts of the Air Force should facilitate integrated, cross-functional decisionmaking to optimize the Air Force enterprise.)
- expand CORONA meetings or create an equivalent forum to include assessment of compliance with Air Force business strategy.³ (CORONAs are ongoing, so discussions at

² An architecture is a formal blueprint for methodically and completely defining an organization’s operational processes and enabling environment (U.S. Air Force, 2011b).

³ CORONA meetings are held three times a year to provide a venue for the most senior leadership of the Air Force to consider important servicewide issues. These meetings are chaired by the SECAF and CSAF.

these meetings would reduce the impact of senior leadership turnover and increase business program stability. Simultaneously, it increases accountability in implementing Air Force business strategy.)

Preprogram Initiation. Before initiation of an IT acquisition program, the Air Force should

- develop a business case following the Business Capability Lifecycle (BCL) format for the IT acquisition consistent with enterprise goals and strategy, and aligned with Air Force business and IT enterprise architectures (Carter, 2011). In building the business case, the Air Force must place a greater emphasis on expected benefits and their realization. This includes:
 - establishing business metrics to measure progress toward the TO-BE environment
 - establishing accountability to the Air Force Corporate Structure by factoring benefits realization into decisions on future funding and program direction⁴
 - considering benefits-sharing with stakeholders to provide incentives for better disclosure and management of benefit realization
 - linking benefits with specific changes to business processes, organizations, and IT.
- develop the transformation governance structure for decisionmaking that advances the goals of the transformation (This needs to be done within the context of the Air Force business strategy and should be aligned with the Air Force enterprise business governance, which is responsible for advancing this strategy and should be co-chaired by the CMO and the VCSAF.)
- conduct BPR and develop TO-BE business processes before determining if a new IT acquisition is appropriate
- initiate appropriate OCM activities as soon as the decision is made to pursue a business transformation
- carry out a stakeholder analysis to identify potential organizational pitfalls and the feasibility of achieving desired benefits within a proposed timeline
- conduct a robust assessment, early in the process, of IT infrastructure and solution compatibility, data sources, structures, definitions, and quality to inform both BPR and IT planning activities.

Post-Program Initiation. After initiating the program, the Air Force should

- decide whether changing the updated business processes or customizing the system is more appropriate
- focus OCM on achieving acceptance of the new technology and required process/organizational changes, frequently accomplished by incentivizing the affected personnel
- update stakeholder analyses and OCM plans (communication, education, and training) as key decisions are made that affect the trajectory of the overall transformation

⁴ The Air Force Corporate Structure, as defined in Air Force Instruction 16–501 (U.S. Air Force, 2006), is a governance structure through which the Planning, Programming, Budgeting and Execution process is implemented. Its strength is the consistency of reviews through successive grade levels and experience within the functional staff. It provides balance in resource allocation decisionmaking.

- deliver IT in manageable increments, considering complexity, operational priorities (e.g., auditability, legacy system retirement), implementation of basic functionality before extensions, complete end-to-end processes where feasible, and coordination with related initiatives (e.g., reorganization, replacement or upgrades of legacy systems, changes in hosting environment)
- engage experts with in-depth knowledge of functional operations and others with relevant technology experience to guide ERP implementation.