Mobilizing ERP Transformation in Modern Corporations

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Author Note

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Abstract

ERP transformations offer immense potential value to multinational corporations. Despite the vast resources and competencies of these organizations, their ERP transformation efforts frequently fail to deliver the expected value. These failures primarily emanate from shortcuts in change management processes, but even failure modes that are not directly related to change management can be mitigated by change management. As a methodology, change management structures are often criticized for being too general. This document leverages a case study review to supplement Kotter's eight-step change process with prescriptive best practices organizations can leverage to improve their chances of ERP transformation success.

Mobilizing ERP Transformation in Modern Corporations

According to Van Tonder (2006, p. 1) "organisational change is one of the most frequently recurring organisational phenomena of our times and has truly become a consistent feature of the organisational landscape". In his 1995 Harvard Business Journal article titled *Leading Change: Why Transformation Efforts Fail,* John P. Kotter proposed a methodology to aid in the implementation of large-scale change across organizations (Kotter, 1995). Kotter's methodology has since become the foundation of change leadership practice and evolved into both a field of study and career practice supplemented and supported by a wide range of studies. Despite this increasing cadence of change and the wealth of research on the topic, the "reported success rate of large-scale change efforts remains disappointingly low" (Van Tonder, 2006, p. 1). With research and knowledge on large scale change at an all-time high, it is surprising to many that there are still so many failures.

Purpose & Significance

A study published by the Center for Creative Leadership reinforces the overall challenge of large-scale organizational change, noting that "between 66 and 75 percent of all public and private change initiatives fail" (Kee & Newcomer, 2008, p. 5). A specific area of struggle for multinational corporations, and the focus of this document, is the organizational change required to succeed in adoption and value realization of enterprise resource planning (ERP) transformations. ERP systems are comprehensive software solutions that are designed to integrate the complete range of an organization's processes and functions to present an all-inclusive view of the business from a single information technology solution (Klaus, Rosemann, & Gable, 2000). Modern multinational corporations have found incentive to undertake the daunting effort and expense of deploying ERP systems to support product expansion, adapt to

competitive sales conditions, develop efficient global distribution networks, and enable a shift in the orientation of business away from mundane daily operations and towards satisfying the needs of individual customers (Vuksic & Spremic, 2005). Table 1 presents a survey of organizations that are undergoing ERP transformation and the benefits they expect to achieve. While different organizations may see different types of benefits, the overall results of ERP adoption should be increased market value for the organization. Research from Ranganathan and Brown (2006, p. 158) support this, noting that on-average "ERP adopters gained 1.47% excess shareholder returns" and "the market value for adopters announcing projects that had a greater functional scope increased 2.86%".

Notable within Table 1 is the lack of focus on technical benefits. This supports the notion that ERP deployments cannot succeed by simply putting a new software solution in place and cannot be successful as an information technology functional project. Business processes must be refined and adapted to match the technology solution for value to be created. This requires a special type of change management called business process reengineering (BPR). BPR is the sweeping redesign of business processes, generally implemented in conjunction with deployment of an ERP solution, to generate greater efficiency, better quality, and more competitive production (Vuksic & Spremic, 2005). For the remainder of this document we consider the coupling of ERP system deployment with thoughtful BPR to be mutually included in the term ERP transformation.

Table 1

Perception of Benefits in ERP Projects

Benefit Description	Likert Scale Mean	Standard Deviation	Benefit Type
Better management and controlling functions	4.13	0.757	Managerial
Financial flows control	4.08	0.830	Managerial
Increased IT infrastructure capability	3.96	0.690	Technical
Information flows control	3.96	0.690	Managerial
Control of flow of goods	3.75	0.737	Managerial
Quickened information response time	3.67	0.868	Operational
Decreased financial close cycle	3.56	0.768	Operational
Improved cash management	3.43	0.728	Managerial
Faster, more accurate transactions	3.42	0.654	Operational
Operational Improved order management/order cycle	3.38	0.770	Operational
Possible redesigning of ineffective business functions	3.33	0.761	Operational
Better resource management	3.30	0.703	Managerial
Improved interaction with customers	3.30	0.765	Strategic
More efficient business processes	3.26	0.689	Operational
Better logistics	3.21	0.588	Operational
Improved decision making	3.17	0.917	Managerial
Support organizational changes	3.17	0.761	Organizational
Better coordination & cooperation between functions	3.17	0.868	Operational
Quality improvement	3.12	0.927	Managerial
Cost reduction	3.08	0.572	Operational
Support business growth	3.00	0.798	Strategic
Improved on-time delivery	3.00	0.511	Operational
Improved interaction with suppliers	3.00	0.780	Strategic
Increased revenue	3.00	0.511	Strategic
Build common visions	2.96	0.751	Organizational
Generate product differentiation	2.92	0.654	Strategic
Facilitate business learning	2.92	0.830	Organizational
Performance improvement	2.88	0.680	Managerial
Productivity improvement	2.80	0.707	Operational
Lowered inventory levels	2.65	0.573	Operational
Cycle time reduction	2.44	1.044	Operational

Note. Adapted from "What determines user satisfaction in ERP projects: benefits, barriers or risks?," by O. Saatçioglu, 2009, *Journal of Enterprise Information Management*, 22, p. 696.

While the value of a successful ERP transformation is significant and provides organizational stakeholders with nearly unmatched incentive to succeed, numerous research studies show that truly successful ERP transformations are rare. Despite the large volume of competent and well-resourced multinational organizations pursing ERP transformation the success rate of these efforts is less than 50% (Hammer & Champy, 1993). A Boston Consulting Group study reinforces the challenge of successful ERP transformation, indicating only one third of ERP transformations could be classified as successful (Soh & Tay-Yap, 2000). Yet another study indicates that only 40% of ERP transformations realize even a portion of the value promised (Trunick, 1999). Beyond achieving the promised value, 20% of organizations that attempt EPR transformations consider efforts to be a total failure (Escalle, Cotteleer, & Austin, 1999). In an extreme example, FoxMeyer Drug filed for bankruptcy, in large part due to a failed ERP transformation (Vuksic & Spremic, 2005).

While the exact proportion of ERP transformations that are successful and the definitions of success can be debated, the trend is clear. ERP transformations fail more often than they succeed, rarely deliver the value expected, and have the potential to be written off as a complete failure that consumed tremendous amounts of precious organizational resources. Prime examples of ERP transformation successes include Cisco Systems, Eastman Kodak, and Tektronix while failures include Hershey, Nike, and Whirlpool (Vuksic & Spremic, 2005). All of these companies have competent leadership and are equipped to properly resource an ERP transformation.

Table 2 shows perceived risks to organizations respective ERP transformation success within organizations undergoing ERP transformation. This survey noted a “high degree of organizational change” and “lack of user acceptance” as the greatest risks to a successful ERP

transformation (Saatçioglu, 2009). It is notable that technical factors, such as software version control and infrastructure capability, were not the primary risks identified.

Table 2

Perception of Risk in ERP Projects

Risk	Likert Scale Mean	Standard Deviation	Risk Type
High degree of organizational change	3.48	0.714	Business
Lack of user acceptance	3.24	1.052	Business
Cost escalation	3.2	0.645	Business
Loss of control over software version migration	3.2	0.913	Technical
Incapability of infrastructure to contend new technology	3.12	0.971	Technical
Retention of skilled people	2.84	0.85	Business

Note. Adapted from "What determines user satisfaction in ERP projects: benefits, barriers or risks?," by O. Saatçioglu, 2009, *Journal of Enterprise Information Management*, 22(6), p. 697.

Having established the large potential organizational value of ERP transformation, it is understandable that organizations pursue them. We can also conclude that failure is more likely than success and that organizations undergoing transformation see their pathway to success threatened by change and acceptance related issues more than technical challenges. The following sections examine best practices for success in ERP transformations within multinational corporations through the lens of Kotter's eight-step change methodology and provide a proactive path to success that organizations can use to avoid common failure modes and realize the expected value from their transformation journey.

Case Study

Rolls-Royce is a multinational industrial corporation based in the United Kingdom that was founded in 1884. With operations in more than 150 countries and more than 22,000 employees, Rolls-Royce alone accounts for 2% of exports from the United Kingdom. The company website notes "Rolls-Royce pioneers cutting-edge technologies that deliver the cleanest, safest and most competitive solutions to meet our planet's vital power needs" (Rolls-

Royce - About, 2019). The company operates in five primary business segments that include civil aerospace, defense aerospace, power systems, marine, and nuclear. This section summarizes applicable aspects of a detailed case study completed by Yusuf, Gunasekaran, and Abthorpe (2004) that outlines Rolls-Royce ERP transformation journey.

In the late 1990's Rolls-Royce faced challenges that were common to multinational corporations. The organization had numerous legacy Information Technology systems that had been internally developed over time to meet the needs of specific business segments, facilities, or corporate functions. These disparate computing systems required some level of integration to enable the organizations daily operation. Interfaces were internally developed to enable this integration but were generally unreliable and inconsistent because the individual systems were built on different database platforms and leveraged different file formats. Aging technology also plagued the company, with lifecycle management practices being inconsistent. Several key systems were not even able to achieve year 2000 compliance without major investment (Yusuf, Gunasekaran, & Abthorpe, 2004).

In addition to the technology challenges Rolls-Royce was facing, there were also business process challenges that were hampering the company's operations and growth efforts. Semi-finished goods often traversed multiple locations as part of the production process and could not be properly tracked by the disparate computing systems resulting in inventory and stock take issues. As the organization grew, it also become more apparent that "work within Rolls-Royce was functionally oriented and various departments worked in isolation" (Yusuf, Gunasekaran, & Abthorpe, 2004, p. 255). These factors kept the organizations leadership focused on firefighting daily operational issues and detracted from focus on growing the business.

In 1996 Rolls-Royce outsourced their Information Technology operations to Electronic Data Services (EDS). The move was intended to refocus the organization on its core objective of making and selling product. As a world leading outsourcer of IT services EDS had a great deal to offer Rolls-Royce including teams of technology specialists, operational and lifecycle management best practices, and experience operating in the aerospace industry. In 1998 the company reorganized into customer facing business units that primarily had sales objectives and operational business units that primarily had manufacturing objectives. All organizations aligned to the executive group, which provided overall leadership and strategic decision making for the company (Yusuf, Gunasekaran, & Abthorpe, 2004).

Along with their organizational realignment, executive leadership decided to embark on an overhaul of the business processes and information technology systems. They enlisted EDS and SAP, the world's largest market share provider of ERP software, to provide specialized expertise and coupled them with internal staff that had deep knowledge of cross functional processes and legacy information technology solutions. At the time SAP was selected, the company had approximately 30% market share in the ERP software market (Vuksic & Spremic, 2005). Operational business units developed mobilization teams that were responsible for implementation and training (Yusuf, Gunasekaran, & Abthorpe, 2004).

Implementing in Phases

Rolls Royce chose a three-phase approach to their ERP transformation. Figure 1 shows the high-level multi-year phased change strategy that led to a planned go live at the end of first quarter 2000. This section provides a high-level overview of the activities that were completed in each phase.

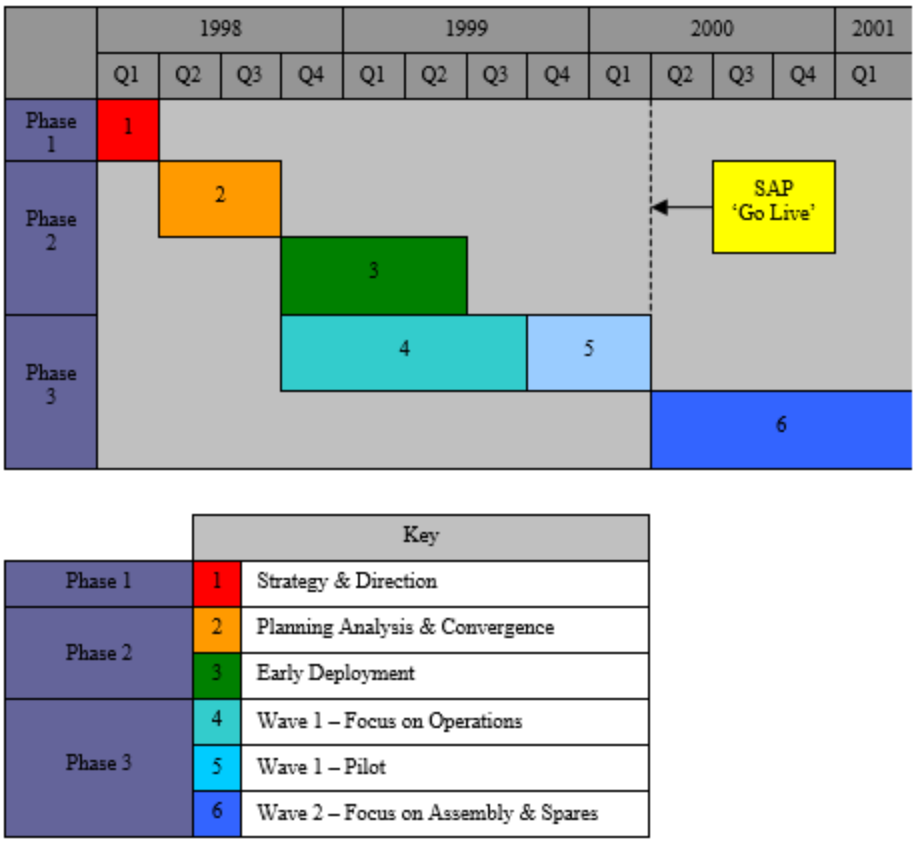

Figure 1. ERP Implementation Model with Project Timescale. Adapted from "Enterprise Information Systems Project Implementation: A Case Study of ERP in Rolls-Royce," by Y. Yusuf, A. Gunasekaran, and M. Abthorpe, *International Journal of Production Economics, 87(1)*, p. 258. Copyright 2003 by Elsevier B.V.

Phase 1 involved intensive study, scope setting, outlining of a project plan, and development of a financial plan for execution of the ERP transformation. To mobilize this phase an ERP core team was formed to oversee the implementation and manage processes and standards associated with the ERP transformation. A separate steering committee was formed to ensure financial performance of the project. Roles and responsibilities were also established for team members and vendors that were participating in the transformation effort (Yusuf, Gunasekaran, & Abthorpe, 2004).

Phase 2 involved the creation of a detailed work plan and installation of the prototype system. As part of the detailed work planning 'High Level Process Confirmation Workshops'

took place, involving hundreds of operational personnel and the ERP core team. These workshops were designed to ensure the ERP core team had accounted for all necessary business processes and variations in their planning efforts. Additional 'Business Simulation Workshops' were conducted with larger groups where core team members and operational employees partnered to simulate leveraging the new ERP to carry-out daily business operations in a non-production environment. These workshops were part of a readiness process that led up to final user acceptance testing, where business process owners provided final sign-off that the ERP was executing the business process as expected prior to its adoption as the authoritative executive system and subsequent go-live with users. A core team member reaffirmed this strategy, noting that "user acceptance training is all about buy off, we're trying to make sure that the ownership is with the business not the core team" (Yusuf, Gunasekaran, & Abthorpe, 2004, p. 263).

Phase 2 also involved ERP integration into legacy information technology systems to allow for the company to operate in an interim state with the majority of the organizations functions not yet transitioned to the ERP solution. Modules and business functions were ordinally activated in a series of three suites from the highest-level corporate functions to the most granular. Suite one involved supply chain planning and key program scheduling, allowing optimized leadership decision making regarding manpower, equipment, technology, and facilities to optimally meet forecast sales demand over a 2-5 year horizon. Suite two leveraged the suite one data to create a production plan that was driven down into manufacturing units for capacity planning and production planning. Suite three dove further into detailed workflow from shop floor production launch through delivery of finished products (Yusuf, Gunasekaran, & Abthorpe, 2004).

Phase three involved activation of the new ERP system in Rolls-Royce facilities and was divided into two waves. The first wave was primarily foundational and focused on replacement of legacy back-end systems and standardizing of all manufacturing operations on a new non-SAP manufacturing system. Wave one also included a pilot deployment of the full ERP solution at one Rolls-Royce facility. During the pilot, several new roles were introduced and the ability and willingness of employees to change how they worked to accommodate the new system was tested. In one case, an employee participating in the pilot noted "I'm told that I've got to spend X amount of time around a PC, it's a bit strange as I must spend around 80 percent of my time on the shop floor today, and that's going to change dramatically" (Yusuf, Gunasekaran, & Abthorpe, 2004, p. 261).

As part of the wave one pilot a strategy of just-in-time training was leveraged. While employee anxiety was heightened by this strategy, the immediate applicability of the training increased employee recall and minimized the need for re-training. One employee shared their anxiety, noting "I go live in 4 weeks and I haven't got piece of kit yet!" (Yusuf, Gunasekaran, & Abthorpe, 2004, p. 262). The immediate training applicability was reinforced by the one core team member, who noted "Once they've been trained and know how to use that piece of kit they will have it then and there" (Yusuf, Gunasekaran, & Abthorpe, 2004, p. 262).

Throughout wave one, implementation teams and users encountered unexpected problems that challenged the businesses ability to successfully operate on the new system. Rolls-Royce leadership decided to delay the completion of wave one by six months to allow for remediation of these issues. Leveraging the extra time project teams were able to: conduct additional training, improve data quality, execute additional testing and development cycles on wave two functionality, drive prerequisite standardization projects, and resolve difficulties

specific to the wave one pilot facility. Addressing these issues early in the program allowed Rolls-Royce to minimize cost associated with the delay, since the wave two deployment organization had not been fully mobilized yet (Yusuf, Gunasekaran, & Abthorpe, 2004).

Upon completion of wave one the go live occurred. This involved establishing the ERP solution as the executive system for all applicable Rolls-Royce operations and quickly activating the system at all facilities to direct daily operations. To establish the new ERP as the executive system, a final data transfer occurred to transition source of record data from legacy systems into the new ERP. This required key company data, which was normally able to be readily modified by employees, to be kept in a stable state for approximately 10 weeks. During two weeks of this activity the new system was made unavailable to users to ensure successful transfer for the data. After the transition legacy systems were switched to read-only mode and individual facilities started the task of activating their employees on new ERP system (Yusuf, Gunasekaran, & Abthorpe, 2004).

Project Risks and Problems

To help track and remediate project risks, the core team maintained a detailed risk register. As risks arose they were recorded and reviewed regularly. While the complete risk register is beyond the scope of the case study, a summary of risks cited by Yusuf, Gunasekaran, and Abthorpe (2004, p. 264) includes:

- "The possible failure or inability to align goals through conflicting directions within the organisation.
- The non-delivery or non-availability of reliable IT hardware and infrastructure both before and during implementation.

- The possible failure of providing inadequate and ongoing support after implementation, from both Rolls-Royce and EDS.
- The resistance of change to new process methods by management and supervision.
- Management and supervision may treat the project as merely an IT implementation, rather than a change in process methods.
- Inadequately educating the workforce to operate the new system properly.
- Possible failure to cut over the new system through the inappropriate systems testing of volume, stress and data conversion.
- Possible failure to give ERP adequate priority due to the number of existing and ongoing business improvements.
- Maintenance difficulties may occur on bridged legacy systems.
- The project may impact on company interim and end of year accounts.
- …"

While the use of the risk register maintained visibility of potential failure modes, it did not prevent all problems. As the implementation progressed, Rolls-Royce experienced problems that can be grouped into three primary areas: cultural, business, and technical. The Rolls-Royce project team made a logic-based assumption that company employees would generally accept the new ERP system as it provided better functionality for the organization in aggregate. As the implementation project progressed it became apparent that, while aggregate functionality was better, some functions or processes did not provide the functionality that was available in legacy systems. The project team's immediate response to these deficiencies was to focus on illustrating the improvements and marketing the benefits to the larger organization. Special focus within this messaging was placed on the benefits of reduced segregation between the

recently formed operational business units, which had operated in silos since their formation (Yusuf, Gunasekaran, & Abthorpe, 2004).

More strategically, Rolls-Royce leadership increased the scope of the ERP transformation to provide additional focus on training and cultural change management for the audience of roughly 10,000 employees that were impacted. Individual teams within Rolls-Royce appointed specialists that received in-depth training from SAP. These specialists then trained additional peer specialists and partnered with EDS to provide training to the remaining mass employee user base. Training was primarily conducted through seminars and workplace demonstrations but was also supported through lower level informational meetings and larger business unit broadcast messages that provided employees with information about more detailed changes to working practices (Yusuf, Gunasekaran, & Abthorpe, 2004).

ERP systems, including SAP, require a relatively standardized and rigid business structure to achieve successful transformation. Cross-functional workshops that were conducted early in the transformation project made it clear that Rolls-Royce would need to change their business processes to accommodate the SAP ERP solution and an internal BPR process was undertaken to support this. These workshops were designed as much to enable change acceptance as they were to ensure correctness and viability of the technology and processes. As new business processes were designed and mapped teams were formed to proactively identify issues within the new processes, attempt to demonstrate the problematic process within the actual SAP system, and adapt or re-map the business process to better align with the SAP ERP. This iterative process allowed Rolls-Royce to avoid costly and resource intensive modifications to the SAP ERP that would have hindered future lifecycle upgrades (Yusuf, Gunasekaran, & Abthorpe, 2004).

Technical problems encountered during the Rolls-Royce ERP transformation primarily involved the accuracy of data being transferred to and leveraged by the SAP ERP software. Data transferred from legacy systems needed to be cleansed, deduplicated and normalized before transfer into the ERP. This data originated in multiple legacy systems that often used different data formats and rules to govern the structure of the data. Additionally, several legacy systems remained active after the initial SAP ERP software was implemented. Interfaces were developed that allowed the SAP ERP software to exchange data with these systems. User acceptance of the need for data stability prior to go live was also a challenge that was sometimes viewed as impacting employees' ability to resolve near term customer issues. In some cases, data was inconsistent between legacy and ERP systems which required analysis and remediation of key business indices such as inventory and WIP. One core team member noted "it's not until you actually try and load the data, get the data in the system and then hopefully let it feed into SAP that you really start to understand that things aren't quite right" (Yusuf, Gunasekaran, & Abthorpe, 2004, p. 263).

As Rolls-Royce moved through pilot and go live activities the organization began to recognize the challenges posed by data quality and legacy interfaces. The organization took steps to protect the integrity of their SAP ERP software while still providing the ability to build functionality that was not part of the core SAP ERP. The company decided to deploy some additional configurable SAP modules that were offered to support the aerospace and defense industry. Governance was created within the organization to ensure that any third-party software solutions were accredited by SAP before they would be considered. Requests for development business reports required a written business case and formal review (Yusuf, Gunasekaran, & Abthorpe, 2004).

Case Study Summary

The scope of the case study reviews Rolls-Royce activities from the inception of the ERP transformation through go live. As organizations progress down the ERP transformation path, it often takes time to realize the benefits. With regard to Rolls-Royce, Yusuf, Gunasekaran, and Abthorpe (2004, p. 265) note "the full benefits of the project will not be fully experienced or achieved until the system becomes executive and has a period of stability, for at least a whole year". It is clear throughout the case study that Rolls-Royce leveraged a number of best-practice change strategies to put their ERP transformation efforts on a pathway to success, while acknowledging that problems occurred and there is room for improvement in hindsight.

Literature Review

Competent organizations such as Rolls-Royce, Nike, and Hershey have the resources and foresight to avoid many of the pitfalls that are common in ERP transformations and field a strong and well-informed transformation plan. Numerous studies have catalogued the pitfalls of ERP transformation and the information is readily available to anyone seeking it. Perhaps ERP transformation successes would be higher if organizations deployed a more comprehensive change strategy that prepares the organization with necessary mindsets to achieve success beyond the adoption of a new computing system and new business process. Change leadership for successful ERP transformations applies not only to the more obvious task of shifting individual mindsets to accept the new system which are challenging by themselves. It also applies to the development of an organizational mindset that will allow for successful change in the face of the budget overruns, technical challenges, shifts in business conditions, and turnover in the executive leadership ranks that is nearly inevitable in such a large and lengthy

transformation. Venugopal and Suryaprakasa Rao (2011, p. 606) articulated this as part of their case study analysis on the ERP transformation topic, indicating:

> At the end-nine months the ERP project was nowhere near completion. Costs had already exceeded the original budget of $X Million as hardware had to be upgraded, additional licenses had to be procured to take care of the revised workflows, users had asked for several additional non-standard reports/customisations (to match legacy system functionalities) that required additional 12 man months of work. New estimates of cost were twice the original estimate which top management had no choice but to approve.

Thus, for the purposes of this literature review change leadership for ERP transformations applies not only to the more obvious task of shifting individual mindsets to accept the new system and process. It extends to deeply embedding the vision within the organization, so it can survive the predictable but often fatal ups and downs that are common to large scale transformation.

Introduction to Kotter's 8-Step Change Methodology

John Kotter's 1995 Harvard Business Review article titled *Leading Change: Why Transformation Efforts Fail* ignited industry recognition of the power that good change management practices can have when thoughtfully leveraged to drive transformation within organizations. A high level overview of his process is articulated in Figure 2. This initial work is based on study of more than 100 change efforts and has become the gold-standard in guiding organizational change and is the basis of much change management research over the past several decades (Mento, Jones, & Dirndorfer, 2002). Among the many researchers to examine Kotter's work, Appelbaum, Habashy, Malo, and Shafig (2012, p. 765) conclude that "Kotter's change management model appears to derive its popularity more from its direct and usable

format than from any scientific consensus on the results". These findings underscore some of the more positive aspects of Kotter's change model, it's generality and usability. But this generality has also been criticized as lacking the prescriptive detail needed to truly drive successful change. Pollack and Pollack (2015, p. 53) echo this, noting that Kotter's process "describe what has to be done but provide little detail in how it should be achieved".

As an introduction to his methodology, Kotter proposes two general lessons. Articulating the first lesson, Kotter (1995, p. 59) indicates "the change process goes through a series of phases that, in total, usually require a considerable amount of time" and "skipping steps creates only the illusion of speed and never produces a satisfying result". He builds upon this with his second lesson, noting that "critical mistakes in any of the phases can have a devastating impact, slowing momentum and negating hard-won gains" (Kotter, 1995, p. 60). By introducing these lessons early in his work, Kotter reinforces the foundational need for patience and to avoid shortcuts when executing large scale change. This finding is echoed through numerous follow-on studies including findings from Kerttula and Takala (2012, p. 250), who articulate the negative change process impact shortcuts can have and note that "implementing a transformative change in a large organization is a multi-stage and challenging learning process". With these foundational factors in mind, the next sections explore the eight steps within Kotter's methodology in detail.

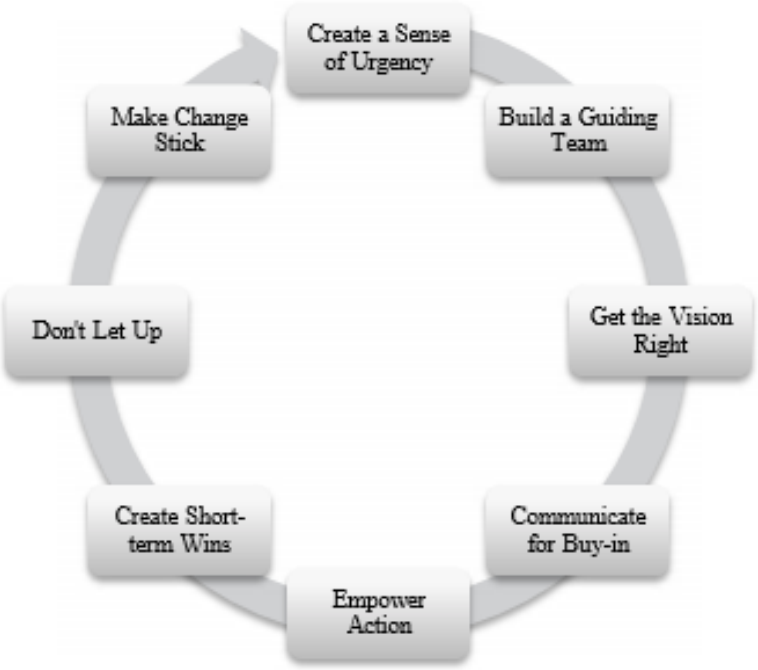

Figure 2. Kotter's 8-Step Transformational Change Process. Adapted from "A Roadmap for Using Kotter's Organizational Change Model to Build Faculty Engagement in Accreditation" by M. Calegari, R. Sibley, and M. Turner, *Academy of Educational Leadership Journal*, *19(3)*, p. 20, Copyright 2015 by the Academy of Educational Leadership.

Establish a Sense of Urgency

The first step in Kotter's process is to establish a sense of urgency. The objective of this step is to unseat the status quo mindset of enough organizational members to develop a fundamental organizational consensus that change is required. Kotter (1995, p. 60) notes that "most successful change efforts begin when some individuals or some groups start to look hard at a company's competitive situation, market position, technological trends, and financial performance". Identifying these opportunities and communicating them to broad audiences in a dramatic fashion is key to establishing a sense of urgency that will enable mobilization of the larger organization to effect change. In some cases, it can even be effective to manufacture a crisis that raises the sense of urgency around an issue.

As obvious and logical as this foundational step seems to be, many organizations fail here. Change leaders can fail by underestimating the effort required to motivate people that are comfortable with the status quo, especially if the threat is not an immediate one. Ansari and Bell (2009, p. 157) support his notion, indicating that "considerable effort may be required to motivate organisational personnel to invest their time and effort and to put up with the inconveniences of change". Organizational management may also find it difficult to extricate themselves from their perpetual role as risk minimizers to condone, let alone champion, the risk that is inherent in transformational change. Finally, change leaders can often declare victory in this initial phase too soon. Kotter (1995, p. 62) notes that a change leader can consider urgency successfully established "when about 75% of a company's management is honestly convinced that business-as-usual is totally unacceptable".

Form a Powerful Guiding Coalition

The second step in Kotter's process is to form a powerful guiding coalition. While change efforts may originate with an individual or small group, a larger group must form and collectively drive to create transformational change. In more expansive organizations such as multinational corporations these groups can be large and tend to operate best when they are cross functional and outside the normal operating hierarchy of the organization. In his writing about forming coalitions, Kotter (1995, p. 62) notes that "in the most successful cases, the coalition is always pretty powerful – in terms of titles, information and expertise, reputations, and relationships". One notable strategy that can help create consensus and build a coalition is offsite retreats or workshops.

Organizations that fail within this step have some commonalities. In general, these organizations lack a history or culture of teamwork within the management ranks of the

organization. Often times organizations that struggle with this change fail to put operational or line managers in leadership roles for these change efforts, instead leaving the leadership to staff leadership that is too far removed from the operational realities of the organization. Kotter cautions that change efforts with coalitions that are not strong enough can make some progress in driving change, but these efforts generally fall apart as opposition builds and creates more structured resistance within the organization (Kotter, 1995).

Create a Vision

Kotter's third step is to create a vision. Terms such as "a picture of the future" or the "art of the possible" are often used in the corporate world to describe the desired outcome of this step. Effective visions go well beyond budgets, facts and figures. They easily communicate the end state of the change in an appealing way to stakeholders of all types. Importantly, a good vision will evolve as the details of the needed change solidify and additional stakeholders with different perspectives join the already powerful and growing coalition that is driving the change. Good visions are also supplemented with an additional level of detail, often referred to as strategies. These strategies are the high level actions the organization will use to achieve the vision.

Organizations that fail to create an effective vision make some of the same mistakes that are commonly visible in uninspiring management bureaucracies that are common throughout the world. Visions that are overly complex or contain too much detail often fail to capture the needed attention and support of the organization. Kotter (1995, p. 63) notes a general rule for effective visions, indicating "if you can't communicate the vision to someone in five minutes or less and get a reaction that signifies both understanding and interest, you are not yet done with this phase of the transformation process".

Communicate the Vision

With an effective and inspirational vision established, Kotter's process moves into its fourth step, communicating the vision. True transformation is impossible unless a notable majority of the organization understand and buys into the vision. Kotter (1995, p. 61) describes this step's key activities as "using every vehicle possible to communicate the new vision and strategies" and "teaching new behaviors by the example of the guiding coalition". While communication of the vision may begin with large executive communications meetings, email announcements, or articles on corporate intranets more is required. Successful communication involves leaderships visible and urgent adoption of the vision in its daily operating model (Kotter, 1995). Visible changes to personal working habits, linking of organizational efforts to the vision during team meetings, and reinforcement of individual roles in achieving the vision during one-on-one conversations are all important ways to reinforce the more traditional mass communication of the vision.

Failure in this step can often be attributed to two primary factors. The first is communicating to an audience that is too small or communicating too infrequently. These scenarios can involve leadership sharing a vision during one townhall that reaches a small portion of the organizational population or sharing it only with their direct reports and suddenly expecting the entire organization to mobilize around it. The second factor is leadership that acts in ways that contradict the vision. If leadership visibly regresses to operating methods that are contrary to the vision, even for short periods, the damage to a change effort can be severe. To successfully progress from this step, the vision must be shared with the vast majority of the applicable organization, continually reinforced through multiple channels, and visibly championed by leadership.

Empower Others to Act on the Vision

Step five in Kotter's process involves empowering others to act on the vision. This step entails active removal of obstacles and altering systems and structures that hinder the organizations ability to progress towards the vision. This includes alignment of organizational structures, compensation incentives, and employee appraisal systems that may limit the momentum a of a change effort. Kotter (1995, p. 65) notes that "action is essential, both to empower others and to maintain the credibility of the change effort as a whole". With barriers removed the guiding coalition can encourage risk taking and nurture new, less traditional activities and operating styles within the organization.

Failure to act decisively in removing barriers diminishes hard earned support among the larger organization for the change effort. Decisive action can be difficult for many organizations that are not accustomed to taking swift action, especially when they involve influential personnel such as members of organizational leadership who may publicly resist the communicated vision. These leaders must be convinced to change their behavior or be removed from the organization quickly. In some cases, members of an organization can struggle to act in alignment with new visions because of artificial or self-imposed barriers, often involving a mindset that equates historical operating models to unwritten "rules", when in reality no rule or constraint exists.

Plan for and Create Short-Term Wins

The sixth step in Kotter's change process is the planning for and creation of short-term wins. Kotter (1995, p. 65) notes that "most people won't go on the long march unless they see compelling evidence within 12 to 24 months that the journey is producing expected results". Allowing a change effort to progress for long periods of time without a visible win provides opportunity for people to lose focus, begin to doubt the vision or change effort, or even shift

from a position of support or neutrality into a position of resistance. Change leaders should carefully select these wins and produce results that are visible and cannot be argued or attributed to factors outside of the change effort.

Organizations that struggle to be successful in the development of short-term wins often leave them to chance rather than proactively planning for them. During the normal course of the transformation effort it is possible that wins will appear and the effort will begin to bear proverbial fruit that can be shown at interim stages to demonstrate the potential of the larger effort. These benefits can easily supplement the planful short-term wins from the team with little downside, whereas a transformation effort with no planned short-term wins that also does not stumble upon them by chance is likely to fail.

Consolidate Improvements and Produce Still More Change

Kotter's seventh step in transformational change is consolidating improvements and leveraging them to produce more change. While change leaders often cannot remove all barriers and non-reinforcing systems in earlier steps of the process, by consolidating improvements that have been made they can amass power for the guiding coalition. This power can be used to eliminate remaining barriers and accelerate the change effort. A multiplier effect can also happen during this step. Members of a successful, more powerful guiding coalition often become promoted and ancillary projects that support the underlying change effort are often resourced. New team members with fresh perspectives and untapped energy also tend to join the change efforts at this point to drive further progress. Kotter (1995, p. 66) notes that "instead of declaring victory, leaders of successful efforts use the credibility afforded by short-term wins to tackle even bigger problems".

When organizations fail in this step it is generally because they declare victory too soon. Kotter (1995, p. 66) states that "…celebrating a win is fine, declaring the war won can be catastrophic". To proclaim the change effort complete with the first visible signs of progress only invites the organization and guiding coalition to let their guard down and summons re-emergence of and regression to more traditional ways of operating. Recovery from a victory declaration is difficult since the guiding coalition beings to disband and focus on other activities.

Institutionalize New Approaches

Kotter's final step is to institutionalize the new approaches into the organization as the default way of operating. Kotter indicates that two factors are critically important in institutionalizing a change. Firstly, the organization must be consciously shown how the changes have helped improve organizational performance. If these improvements are not explicitly pointed out to people within the organization, they are left to their own interpretation of the results which may be jaded by a limited view of the total organization or attributed to factors outside the organization's new behavior.

Secondly, succession planning for organizational leadership needs to visibly elevate leaders of the change. It is not enough to promote leaders that adopted the change or that didn't resist the change. Kotter (1995, p. 67) supports this, noting "if the requirements for promotion don't change, renewal rarely lasts" and "one bad succession decision at the top of the organization can undermine a decade of hard work". Additionally, retirements, transfers, and life events can all cause unexpected turnover within the organization. Change success depends on embedding change leaders throughout succession plans early in the change process and maintaining this posture long after the change has been operationalized.

Analysis

In reviewing the current research on ERP transformation pitfalls and success factors, the clear majority of recommendations and best practices are frustratingly high level and lack the specificity to be useful to aspiring change leaders. This section combines the detailed best practices leveraged by Rolls-Royce in their ERP transformation, aligns them to the first seven steps of Kotter's eight step change management model, and discuss the root of their important in ERP transformation success. Analysis of the eighth and final step is excluded since the Rolls-Royce case study did not address the post-implementation institutionalization of the new ERP solution and processes.

Table 3 lists the 30 individual best practices leveraged by Rolls-Royce in their ERP transformation journey. Each best practice is linked to the relevant step from Kotter's change management model. It is important to note that many of these best practices have the ability to impact multiple steps. For example, super users and subject matter experts have the ability to support a successful transformation throughout nearly every step in Kotter's change management model. For the purposes of this analysis the step from Kotter's change management model where the best practice had the greatest impact on overall ERP transformation success was selected. This analysis provides deeper discussion of one best practice (indicated in the Deeper Analysis column or Table 3) for each step in Kotter's change management model and articulates how organizations should leverage the best practice to drive change success.

Table 3 - Best Practice Inventory from Rolls-Royce Case Study

Kotter Step	Best Practice	Deeper Analysis
1- Establish a Sense of Urgency	IT System - Lifecycle Burning Platform	X
1- Establish a Sense of Urgency	IT System - Integration & Interfaces	
1- Establish a Sense of Urgency	Organization - Department Segmentation	
2 - Form a Powerful Guiding Coalition	Staffing - 3rd Party Integrator	
2 - Form a Powerful Guiding Coalition	Staffing - Core Deployment Team	
2 - Form a Powerful Guiding Coalition	Organization - Operational Business Units	X
2 - Form a Powerful Guiding Coalition	Leadership - Executive Steering	
3- Create a Vision	IT System - Industry Specific Modules	
3- Create a Vision	Leadership - Establish Vision	
3- Create a Vision	Leadership - Clear Project Objectives & Strategies	X
4- Communicate the Vision	Training - Super Users	X
4- Communicate the Vision	Deployment - User Acceptance Testing	
4- Communicate the Vision	Organization - Process Confirmation Workshops	
4- Communicate the Vision	Leadership - Profess Strategic Direction	
4- Communicate the Vision	Leadership - Visibly Champion & Promote	
5 - Empower Others to Act on the Vision	IT System - Master Data Standardization	
5 - Empower Others to Act on the Vision	IT System - ERP Hardware Investment	
5 - Empower Others to Act on the Vision	IT System - Local Facility Hardware Upgrades	
5 - Empower Others to Act on the Vision	Training - Just in Time	
5 - Empower Others to Act on the Vision	Training - Train the Trainer	
5 - Empower Others to Act on the Vision	Cost - Initial Budgeting Planning	
5 - Empower Others to Act on the Vision	Cost - Willingness for Additional Investment	X
5 - Empower Others to Act on the Vision	Deployment - Blackout Period / Data Freeze	
5 - Empower Others to Act on the Vision	Staffing - New Functional Roles	
5 - Empower Others to Act on the Vision	Leadership - Financial Oversight	
5 - Empower Others to Act on the Vision	Risk Register	
6 - Plan for and Create Short-Term Wins	IT System - Legacy System Harvest Plan	X
6 - Plan for and Create Short-Term Wins	Deployment - Pilot	
6 - Plan for and Create Short-Term Wins	Deployment - Phases	
7 - Consolidate Improvements and Produce Still More Change	Deployment - Pause / Delay	X

Establishing Urgency with Lifecycle Burning Platforms

As the objective of this initial step in Kotter's process is to unseat the organizations status quo mindset and prepare the organization for change, it is important for change leaders to create a brief inventory of pain points the organization faces that could be resolved through ERP

transformation. According to Wenrich and Ahmad (2009, p. 61) "organizations choose to employ ERP systems for many reasons that include the desire to replace several legacy systems…" and common foundation for urgency around replacement of legacy systems is the burning platform. Reinstein (2007, p. 56) defines a burning platform as "a business initiative that must be done for a company to stay in business". In an information technology context, legacy computing systems that do not support key businesses objectives or pose business risk due to failure-prone aging technology can be considered burning platforms.

The case study with Rolls-Royce demonstrated best practice leverage of burning platforms to establish a sense of urgency that supported their ERP transformation by pointing out both the missed growth opportunity and potential for business disruption that was posed by their legacy systems. Change leaders in the case study chose to highlight the inadequacy of the legacy systems to meet the business objectives (potential upside) noting that legacy systems "did not provide accurate, consistent, and accessable data that was required for good and timely decision-making and performance assessment" (Yusuf, Gunasekaran, & Abthorpe, 2004, p. 255). To build the case of change further, leaders pointed out the risk of outage and lost business posed by these aging legacy system noting "some of these legacy systems were so old that they had year 2000 compliance problems" (Yusuf, Gunasekaran, & Abthorpe, 2004, p. 255).

Forming a Powerful Coalition with Operational Business Units

As organizations begin to mobilize the urgency they have created, they move onto Kotter's second step in forming a powerful coalition. Appendix C contains an organizational component model proposed by Janicijevic (2017), that encourages consideration of hard componentats (organizational structure and organizational control) and well as soft components (organizational culture and organizaitonal leadership) when forming a coalition to drive

organizational change. Operational business units are those at the core of a company that provide enterprise-wide services to the customer-facing business units in the company. Because ERP transformation efforts engage the entire business process, the driving coalition cannot be led by the Information Technology organization alone and must include operational business units to be successful. Wagner, Beimborn, and Weitzel (2014, p. 244) note that "social capital among IT and business units consists of formal and informal relationships along different dimensions, such as interaction patterns, mutual trust, and shared language". This social capital frequently exists at the operational level between Information Technology and operational business units and is instrumental in building the powerful and cross-functional coalition necessary to mobilize and drive an ERP transformation. While smaller organizations may function without operational business units, larger organizations have been quick to adopt consolidate functions across businesses and geographies into larger operational business units. Mhatre (2012, p. 342) notes that "economic globalization and internationalisation of operations are essential factors in integration of suppliers, partners and customers within and across national borders ...". These benefits are both similar and complimentary to benefits sought through ERP transformation.

Rolls-Royce leveraged this best practice as they undertook their ERP transformation. Prior to the ERP effort the company had organized into customer-facing business units and operational business units (Yusuf, Gunasekaran, & Abthorpe, 2004). The case study discussed the challenge of segmentation and siloed work among these new operational business units, a situation that would be challenged by a successful ERP transformation. As the change gained momentum at Rolls-Royce, the social capital between members of the operational business units and Information Technology organization was built into a core team that included subject matter

experts, influencers, and senior leaders that provided the successful foundation for the change effort in alignment with Kotter's process.

Establishing a Vision with Clear Project Objectives and Strategies

Within Kotter's third step, a compelling vision is established. Many organizations deliver a vision that is at the macro organization level and is too high level for individual contributors to apply to their daily work. A successful vision not only paints a picture of the future at the macro level, but also include clear objectives and strategies that individual contributors throughout the organization can use to envision their contribution to the transformation and end state post-transformation. According to Wenrich and Ahmad (2009, p. 62) "a documented set of objectives and desired deliverables on which to analyze an ERP system's performance is a good way to judge its success beyond the usual parameters of schedule and budget expectation". Appendix A provides a model proposed by Anantatmula (2015) that indicates a number of factors that contribute to a vision including project size, collaborative culture, and policies and procedures. While it may be tempting for change leaders to create a lengthy list of KPIs and objectives as part of the vision, it is important to keep Kotter's guidance in mind and ensure the complete vision can be communicated effectively in five minutes or less and elicits a reaction that affirms understanding and interest (Kotter, 1995).

According to Venugopal and Suryaprakasa Rao (2011, p. 610) visions can sometimes overstate future benefits and lead to "a large gap between expectations and actual delivery leading to expectations-disconfirmation and thereby dissatisfaction". This explains the situation experienced at Roll-Royce as they struggled with this step in Kotter's process and faced additional investment and rework as part of their ERP transformation. The case study indicates that, contrary to the espoused vision of increased functionality from the ERP, some functions

"might not get the full appreciation the legacy systems once had" (Yusuf, Gunasekaran, & Abthorpe, 2004, p. 256). To resolve this situation Rolls-Royce deployed additional resources to change acceptance and altered the vision to focus on benefits for the company as a whole while acknowledging the limitations, productivity sacrifices, and functionality reductions that may be experienced by a limited number of functions.

Communicating the Vision through Super Users

With the vision established, Kotter's fourth step is the broad and consistent communication of the vision. While Kotter addresses the common methods (town halls, newsletters, …) and frequency (reinforced often, not just one time) with which the vision should be communicated, one of his more important observations is that change leaders need to continually demonstrate their commitment to the change and "incorporate messages into their hour-by-hour activities" (Kotter, 1995, p. 64). Super users, with advanced knowledge of the new ERP system and recognized hands-on subject matter expertise are in an ideal position to continuously communicate the vision, help employees understand their role in achieving the vision, and clarify the employee's role when the end state vision is achieved. Willis, Willis-Brown, and McMillan (2001, p. 40) define a super user as "someone who is traditionally a strong functional user with a knack for the analytical" and note that "these functional people will be trained in the configuration and setup of their area and will eventually become "owners" and take responsibility for maintaining the system".

Rolls-Royce successfully leveraged the super user strategy to drive beyond training and support to the communication of the vision throughout all levels of the organization. Within their ERP deployment project teams, Rolls-Royce embedded "specialist internal managers and staff that have vital knowledge and experience of the old internal systems" (Yusuf, Gunasekaran,

& Abthorpe, 2004, p. 256). These team members had credibility within the organization and understood legacy employee roles. Upon receiving in-depth training on the new ERP systems and engaging in workshops to understand the ERP transformation vision they were able to not only help employees adopt the new systems but also to communicate their role in achieving the vision and how their life would change after the ERP transformation was complete.

Empower Others to Act on the Vision with Additional Investment

After the vision is widely communicated it is important that change leaders' clear barriers that prevent the organization from acting toward the vision. Appendix B provides a framework from Schlesinger and Kotter (2008) that can be leveraged to help identify and address general resistance and barriers to action. One of the most important factors in the success of a project is appropriate and sufficient funding (Tickles, Yadong, & Walters, 2013). This is especially true of ERP transformations, where an organization's ability to adjust to cost overruns is a critical factor in overall success and this risk can be mitigated by employing change management to articulate the likely need for additional investment from the very beginning of the transformation effort (Marchal, 2017). As organizations progress through their ERP transformation it often becomes clear that additional investment is required both in adjacent information technology systems that were missed in the initial plan and areas that were simply not budgeted with sufficient investment to be successful. Organizations that fail to recognize the high likelihood of additional funding from the outset of an ERP transformation are more likely to slow or cancel their transformation efforts in-flight and risk losing the value realization potential.

While corporations may have good financial discipline and forecasting skills, the barrier of additional investment is common to ERP transformation efforts. Research by Mabert, Soni, & Venkataramanan (2001, p. 73) found that "… larger enterprises spent between 1.5 and 2 percent"

of annual revenues to complete their respective ERP transformations. With the cost of transformation being so high change leaders may understate the total cost during earlier stages of the change process in order to gain easier acceptance of the change. This situation raises barriers that must be addressed before the transformation effort can proceed.

Rolls-Royce experienced both unplanned adjacent and insufficient budgeting barriers in their ERP transformation. From an unplanned adjacent investment perspective, the case study notes that "Rolls-Royce have estimated that over 1000 additional PCs will be required and the total cost of the network infrastructure was about two million pounds" (Yusuf, Gunasekaran, & Abthorpe, 2004, p. 258). From a planned but underbudgeted perspective, the case study reveals that additional investment in training, data cleanup, and change acceptance were required to successfully exit wave one of the deployments (Yusuf, Gunasekaran, & Abthorpe, 2004).

Plan for and Create Short-Term Wins by Harvesting Legacy Systems

As an ERP transformation progresses in execution and action through the empowered organization, leaders need to intentionally create visible short-term wins along the way to drive project momentum and keep the support of stakeholders and team members. Babcock, Greer, and Babcock (2011, p. 52) note that "leaders should strive to get critical system functionality on line early in the project to gain momentum for the implementation". This obvious step is generally successful in many organizations ERP transformation journeys; however, it often leaves the organization at a point where both legacy systems and ERP coexist. This multiplies the operational cost structure and provides the temptation for the organization to regress to legacy systems when issues or inefficiencies are discovered within the ERP system or its surrounding business process. Studies from Venugopal & Suryaprakasa Rao (2011, p. 612) conclude that "… a well-entrenched legacy system negatively influences ERP adoption – only

when legacy system influences are reduced do the ERP best practices gain acceptance." Harvesting legacy systems quickly provides a short-term win for the team that both reduces operating cost and solidifies the new ERP system and its processes by removing pathways to regress to the historically embedded processes of the past.

Rolls-Royce was able to partially achieve this best practice in their ERP transformation. As the ERP functionality was released, legacy IT systems were placed into a view only state to ensure that the ERP was considered the sole executive system for the organization. This had the effect of driving adoption of the new ERP system and business process. Some cost reduction was likely achieved as the legacy systems no longer needed to be maintained at the high level of rigor that was necessary when the business depended on them for executive operations, however some cost (power, hardware leases, staff time, backups, ..) were likely required to maintain the system in its view only state. Additionally, the mere existence of the legacy system could create the temptation for the organization to bring it back online and regress if problems were encountered with the ERP system. Completely harvesting the legacy systems would have provided the full financial savings while eliminating the potential to regress.

Consolidate Improvements and Produce Still More Change by Pausing

After generating some improvements and wins, it is important for change leaders to leverage the credibility they have built within their change effort to execute the more difficult portions of the transformation. Often change leaders are tempted to drive these next, more difficult transformational steps before they are ready to maintain momentum. Proceeding when the organization or technology are not ready is often visible to the organization, can erode the change leaders credibility, and is similar to the early declarations of victory that Kotter warns about (Kotter, 1995). In situations where readiness for these difficult transformational steps is

uncertain change leaders may leverage their earned credibility to take a brief pause to ensure readiness before proceeding.

Rolls-Royce employed this strategy effectively in their ERP transformation. After Rolls-Royce successfully completed their initial pilot "the completion of wave one was deferred for about 6 months" (Yusuf, Gunasekaran, & Abthorpe, 2004, p. 259). Numerous reasons were noted for the delay including additional training time, data cleanup, and usability issues. The project team had gained momentum from the successful pilot but was also keenly aware of these issues and their potential impact in the larger deployment waves. The change leaders elected parlay their success into a short delay to allow these issues to be resolved and increase the changes of success in the larger deployment.

Summary and Conclusions

This document has examined the process of ERP transformation in large multinational organizations. This examination produced the conclusion that the potential benefit of ERP transformation in terms of enterprise value is great and, despite decades of experience, ERP transformations frequently fail to produce the expected value and are often considered failures. Further analysis concluded that ERP transformation failures are primarily related to change management and even non-change management related failure modes can be mitigated through proactive change management.

A brief review of Kotter's eight-step transformation process was conducted, and it was concluded that this change methodology, along other similar methodologies, were too high level to move the needle on ERP transformation success. Additional prescriptive guidance was needed. To generate this guidance, a case study from Rolls-Royce was reviewed, specific best practices for ERP transformation were extracted from the case study, and these best practices

were aligned to Kotter's process steps. Deeper analysis was completed on one best practice for each of Kotter's first seven steps to determine how it could be applied to improve the chances of ERP transformation success and how effectively Rolls-Royce leveraged the best practice in their ERP transformation. It was concluded that organizations can improve chances of achieving successful ERP transformation by: establishing urgency with lifecycle burning platforms, forming a powerful coalition with operational business units, establishing a vision with clear project objectives and strategies, communicating the vision through super users, empowering others to act on the vision with additional investment, planning for and create short-term wins by harvesting legacy systems, and consolidating improvements and producing still more change by pausing.

While each organization's ERP transformation has unique circumstances, the prescriptive best practices analyzed in this document can be adapted and leveraged as the foundation of a change management strategy that follows Kotter's well accepted change management model. As organizations leverage these best practices it will be necessary for them to acknowledge the challenges and difficulties that come with an ERP transformation rather than simply focusing on the organizational benefits. This includes acknowledgement of a more realistic and unforeseen picture of the cost, time, and resources required to be successful in addition to the acknowledgment that there will be failures and restarts along the way. Faced with this picture organizations will bifurcate into those that are emboldened and prepared to do what is necessary to succeed and those organizations that decide the timing, business conditions, or strategy of ERP transformation are not right for them.

In either case the change leadership strategy was successful. For organizations that proceed, they are better prepared for the reality and investments that await. For organizations

that choose not to proceed, valuable resources and organizational focus are preserved for other priorities that may drive business value. The point of failure is between these two scenarios, where an organization has already committed substantial resources to an ERP transformation and reached the point of no return only to find themselves with insufficient resources, will power, or time to regroup and complete the effort. Leveraging a robust change strategy will help organizations avoid this is scenario by either deferring ERP transformation or reaffirming their commitment to the strategy with realistic requirements and either path is win.

Future research should continue the to build on the inventory of prescriptive best practices for ERP transformation that can be leveraged within Kotter's process to increase organizations chances of success and full value realization. While this document leverages case study research from the manufacturing industry, research on additional industries (healthcare, retail, transportation, …) and geographies (Asia, Latin America, …) could provide insight into case-specific success factors for ERP transformations. This wider research could also identify strong success factors that are common to all scenarios and develop a comprehensive prescriptive framework for ERP transformation success.

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Appendix A

Figure A1. Considerations When Creating Project Goals. Adapted from "Strategies for Enhancing Project Performance" by V. Anantatmula, *Journal of Management in Engineering*, 31(6), p. 4, Copyright 2015 by the Journal of Management in Engineering.

Appendix B

Approach	Commonly used in situations	Advantages	Drawbacks
Education + communication	Where there is a lack of information or inaccurate information and analysis.	Once persuaded, people will often help with the implementation of the change.	Can be very time consuming if lots of people are involved.
Participation + involvement	Where the initiators do not have all the information they need to design the change, and where others have considerable power to resist.	People who participate will be committed to implementing change, and any relevant information they have will be integrated into the change plan.	Can be very time consuming if participators design an inappropriate change.
Facilitation + support	Where people are resisting because of adjustment problems.	No other approach works as well with adjustment problems.	Can be time consuming, expensive, and still fail.
Negotiation + agreement	Where someone or some group will clearly lose out in a change, and where that group has considerable power to resist.	Sometimes it is a relatively easy way to avoid major resistance.	Can be too expensive in many cases if it alerts others to negotiate for compliance.
Manipulation + co-optation	Where other tactics will not work or are too expensive.	It can be a relatively quick and inexpensive solution to resistance problems.	Can lead to future problems if people feel manipulated.
Explicit + implicit coercion	Where speed is essential, and the change initiators possess considerable power.	It is speedy and can overcome any kind of resistance.	Can be risky if it leaves people mad at the initiators.

Figure B1. Strategies for Project Change Acceptance. Adapted from "Choosing Strategies for Change" by L. Schlesinger, J. Kotter, *Harvard Business Review*, 86(7 8), p. 136, Copyright 2008 by Harvard Business Review.

Appendix C

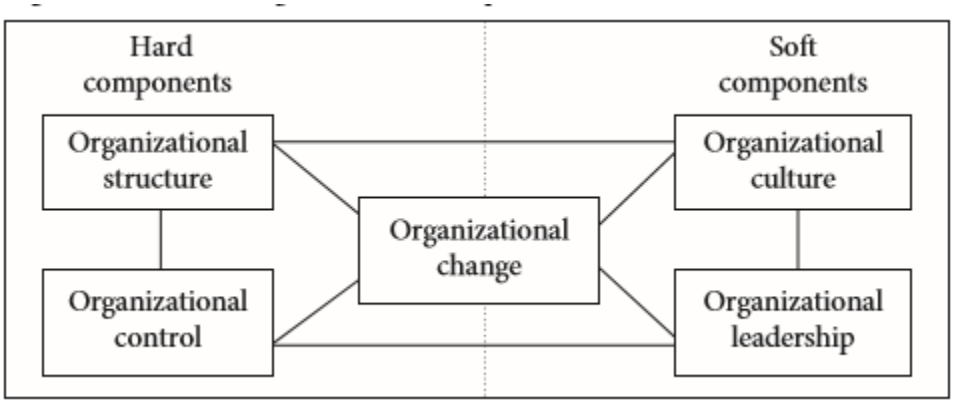

Figure C1. Organizational Change Coalition Considerations. Adapted from "Organizational Models as Configurations of Structure, Culture, Leadership, Control, and Change Strategy" by N. Janicijevic, *Economic Annals*, 62(213), p. 70, Copyright 2017 by Economic Annals.