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Deploying an Enterprise Resource Planning (ERP) solution is a complex and risk laden program of work that not every company is successful in delivering. In this study, the author (an IT leader at a large pharmaceutical company) presents a case study where he draws upon his experiences and learnings from leading two ERP implementations, as well as a literature review examining whether the author's hypothesis that IT Governance is the critical success factor in ERP deployments is supported amongst IT industry researchers, analysts, and strategists. The study goes was able show a strong correlation between companies who have strong IT Governance presence on ERP deployments and their ability to deliver the program of work successfully.

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A CASE STUDY AND LITERATURE REVIEW: HOW EFFECTIVE IT
GOVERNANCE IS THE KEY TO SUCCESSFUL ENTERPRISE RESOURCE
PLANNING DEPLOYMENTS

by
Charles S Fultineer

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Lew Hassell

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1. Introduction

At a prominent global pharmaceutical company (we will refer to the company as xPharma for the remainder of this paper to provide anonymity to the company and protect any non-disclosure agreement obligations I have to the company as a current employee), the company's executive team approved a plan to simplify its operations by streamlining its Manufacturing and Supply Chain (MSC), Finance, and Human Resource (HR) business processes and systems. xPharma's IT business unit was tasked to drive this simplification program by moving the company off of bespoke processes and systems to enterprise technology platforms known as Enterprise Resource Planning (ERP) solutions. The vision that many large companies across a range of industries (including pharmaceuticals) have is to buy commercial Software as a Service (SaaS) applications that meet the needs of the majority of their business and move away from building and supporting highly customized, high total cost of ownership (TCO) applications that meet the needs of a few. The concept is to purchase as much as possible out-of-the-box (also known as commercial off the shelf – COTS) to reduce configuration, customization, and ongoing support costs. The onus and costs to maintain the applications with patches and bug fixes, software upgrades, data storage, and even training is being pushed to these software providers to reduce the internal overhead of having in-house resources that traditionally would bear the aforementioned application support burdens. Gartner (an

industry leader in technology research) suggests ERP business benefits are realized in the form of: IT cost savings, business process efficiency through standardization, and business innovation (Gartner, 2013). There are a number of software providers that offer ERP solutions to companies like xPharma such as Oracle (Oracle e-Business Suite), SAP (SAP Business One), Workday Inc. (Workday), and Microsoft (Microsoft Dynamics). xPharma has selected SAP Business One for its GMS and Finance demands, and Workday for its HR requirements.

My roles at xPharma during the ERP deployments were to serve as a Business Consultant supporting the IT Lead of the Finance - SAP implementation in the Research & Development (R&D) business unit through the business initiation and planning and phases of the program; my other role was IT Lead overseeing the program management on the HR – Workday ERP implementation (also within the R&D business unit) where I was accountable for the overall driving and management of the program through the full program lifecycle:

- **Initiation**
- **Planning**
- **Execution**
- **Closure**
- **IT Governance (throughout)**



Figure 1: Program/Project Lifecycle

Focusing on the latter bullet, IT Governance (ITG), is what I and other key opinion leaders in the field of information technology (as supported in my literature review)

believe to be one of the most critical tools in a program leads tool belt to ensure a complex program of work like an ERP deployment is delivered successfully. ITG is defined as the processes that ensure the effective and efficient use of IT in enabling an organization to achieve its goals. Through my experiences as a contributor on one IT Governance Board and the leader of another, I attribute the success of the ERP programs I participated on principally to effective ITG (not solely to, but certainly largely on effective ITG). This paper is in-part a case study where I draw upon my experiences as an IT leader at xPharma tasked to direct the delivery of two large ERP deployments and achieved success through effective ITG, and a second component of the paper is a literature review examining the role ITG plays in ERP deployments through the eyes of key opinion leaders in the industry (researchers, consulting firms, etc.). It is my hypothesis based on my case study and literature review that effective IT Governance is the key to successful Enterprise Resource Planning deployments.

2. Case Study

2.1 Study Context

The backdrop and scope of this case study is essential in order to fully appreciate how complex ERP deliveries are and why ITG is so key, especially in a big corporation like xPharma: a fortune 100 company with one hundred thousand employees across 150 countries in a heavily regulated industry (pharmaceuticals). The Manufacturing and Finance ERP deliveries of SAP alone will cost xPharma 2.5 billion dollars and take 5 years to fully incubate and embed these solutions to each of the 150 countries. The HR - Workday implementation is smaller in complexity, so in turn will cost less and take less time to deliver, yet the price tag is still expected to reach 500 million dollars and take 3 years to deliver to all 150 countries.

Pre-ERP conception, xPharma had an estimated 125 GMS, 75 Finance, and 50 HR legacy systems supporting their respective business units that have built-up large volumes of data and have been customized to support hundreds of specialized business processes over the years (some systems have been in place for 2 plus decades). Furthermore, dozens of these processes and thousands of records are subject to legal preservation, regulatory review, are currently being used in a clinical study (which can run 10-15 years), etc., which prohibits xPharma from being able to just turn off the lights (retire) one system and turn on another seamlessly. Because of this, a significant portion of the ERP budget is allocated to the business analysis, risk management, data migration, and decommissioning efforts to move from one technology to another. In many cases

(xPharma being one of them), companies have no choice but to ultimately keep and run the legacy systems in parallel with the ERP solution for a period of time, or even indefinitely, until they can fully break their dependencies on the legacy systems. It is also widely recognized that ERP solutions out of the box only meet roughly 80% of a company's business requirements, so the other 20% of their requirements must either be built into the ERP solution through costly customizations and/or configurations, or be fulfilled in a separate system.

2.2 The Data Set: Risks, Responses and KPIs

Upon taking my assignment as the R&D IT Lead over the HR program, I was given the following advice from my leadership team: "ERP programs are complex and most companies are unsuccessful because they do not embrace the complexity; it's not a matter of *if* something will go wrong, but a matter of *when*" (the xPharm R&D Leadership Team). My performance as the IT Lead over the HR ERP deployment was evaluated based on two criteria:

1. Was the program delivered successfully with Key Performance Indicators (KPIs) realized?
2. Did I demonstrate sound leadership when issues surfaced, and were the strategies and risk mitigation plans I put in place as part of the IT Governance Board effective?

As foretold, throughout the R&D ERP programs at xPharma (namely the Finance and HR ERP deployments) challenges/risks were posed to xPharma's IT organization at various stages in the ERP program lifecycle. The following risks are a sample from the R&D ERP programs:

Risk	Risk Attributes	
<p>R1) The Board of Directors and Executive Team selected a one size fits all ERP system (a single SAP template) for their Finance processes, yet there are currently 4 separate instances of Oracle (xPharma’s legacy Finance technology) setup for each of the 4 business units (R&D, Sales and Marketing, MSC, & Corporate) because their processes and technology needs are disparate. This introduces a risk that R&D will not be able to decommission their legacy systems as key processes are not available in target SAP template</p>	Lifecycle Stage:	Initiation
	Probability Risk materializes:	High
	Impact if Risk will materialize:	Diminished Overall Customer Satisfaction & Benefits Realization
<p>R2) Quality documentation and subject matter expertise of existing HR legacy systems and processes were sparse considering those who built the systems and designed the processes several years to decades ago have long since left the company. This introduced several risks including quality risks to the implementation because trying to write “To Be” requirements without fully understanding the “As Is” requirements leaves room for error in the requirements gathering and planning</p>	Lifecycle Stage:	Planning
	Probability Risk materializes:	High
	Impact if Risk will materialize:	Diminished Quality
<p>R3) Timelines for the ERP production releases were set & strictly enforced by xPharma’s executive team with little input from the IT organization. The IT organization did not have the autonomy to adjust the plans as they see fit. If the program was not ready to migrate all business processes by the mandated cutover/Go Live date, the legacy systems would need to remain in production</p>	Lifecycle Stage:	Planning
	Probability Risk materializes:	High
	Impact if Risk will materialize:	Diminished Quality & Business Case
<p>R4) Not all of the nuances of change moving from the legacy technology to the new ERP systems were fully understood and consequently scoped prior to the production releases. This introduces a risk that the programs missed requirements and have a high probability of deploying defective code</p>	Lifecycle Stage:	Execution
	Probability Risk materializes:	High
	Impact if Risk will materialize:	Increased Volume of defects
<p>R5) IT Programs tend to have heavy resource (namely contractor) engagements during the initiation, planning and execution phases, but much of the talent tappers off before closure given this is the most tactical phase of a program. This poses a risk to the organization in that there may be unfinished deliverables like an Action Review (AAR) where learnings are collected, documented succession plans, knowledge transition to xPharma staff accountable for steady state support, etc. that could extend the project timelines if not completed</p>	Lifecycle Stage:	Closure
	Probability Risk materializes:	Medium
	Impact if Risk will materialize:	Extended Timelines
<p>R6) the combinations of a multi billion dollar joint venture, a massive xPharma restructure, & 3 concurrent ERP deployments in the same timeframe put strain on</p>	Lifecycle Stage:	All Phases
	Probability Risk materializes:	High

the organization and posed a risk that too much change may leave too little time for proper ERP training & change management	Impact if Risk materializes:	Poor Organizational Readiness
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Figure 2: Joint R&D ERP Programs Risk Registry

The abovementioned risks are real examples that tested the xPharma IT organizations' resilience, agility, and leadership. In an ideal situation, all complexities/challenges/threats (AKA risks) to these programs would be known in advance of initiation with fixed plans in place to mitigate those risks. In reality, ERP deployments are dynamic and complicated, and not every company is successful in their ERP deployments because they do not have the leadership (inclusive of ITG) in place to manage the complexity and volatility of ERP deployments. As Accenture (a market leader in management consulting, technology services and outsourcing) astutely explains, "the large and complex nature of a global ERP implementation requires a similarly expansive and robust governance model" (Accenture, 2013) For such risks, an IT Governance Board (or often called a Steering Team) was formed at xPharma to assess (what are the risks to the program?), diagnose (what are the root causes of the risks?), act (what actions should we take to respond to these risks?), and monitor (how effective have our actions been at resolving the issues?). The IT Governance Board (ITGB) framework used at xPharma during both the Finance and HR ERP programs is illustrated and explained below:

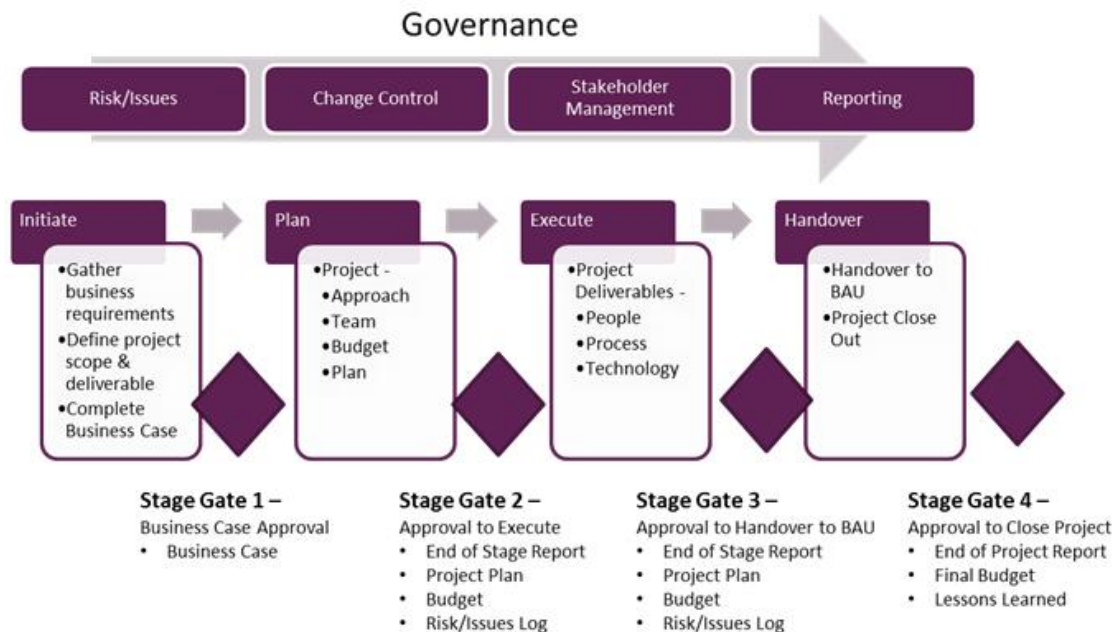


Figure 3 - IT Governance Board Framework (Elite International Consultancy, 2013)

As outlined in the diagram above (Figure 3 – IT Governance Board Framework), ITG is embedded through the program/project lifecycle with controls in place to iteratively monitor and influence the programs’ progress. This case study examines how the IT Governance Boards at xPharma responded to the risks identified in the Finance and HR ERP deployments using the ITGB process, and how those decisions ultimately affected the programs’ KPIs.

The following KPIs were established to measure success across each of the ERP programs:

Service Level Agreement (SLA) Category	Key Performance Indicators (KPIs)	Measurement	Target Service Level
Timelines	Target Milestone Dates	All program milestones delivered on or before approved target dates	100%
Finances	Budget Variance	Spend is within plus or minus 10% of approved budget	+/-10%
Quality	Volume of Defects	Percentage of critical or medium impact issues detected post production release	<2%
Incident Management	Response times to incidents	All critical and medium priority tickets are resolved within 24 hours of raising	<24 hrs
Change Management	Organizational Readiness	Percentage of staff trained ahead of ERP implementation	≥80%
Voice of Customer	Overall Customer Satisfaction	Percentage of staff that would recommend ERP solution to a friend	≥90%
Business Case/ROI	Benefits Realization	Percentage of Soft and Hard Benefits are realized within projected realization dates (ex: ERP business process efficiencies are realized within first 6 months of the production release)	≥90%

Figure 4: xPharma's R&D ERP KPIs

How an organization defines success on an ERP program is subjective and inconsistent across the industry, but one principle KPI companies are weighing more heavily than others is ROI, or as xPharma calls it Benefits Realization. Panorama Consulting Solutions supports this principle in their *Defining ERP Success for Your Organization* article explaining: “the business case should be an important mechanism to not only justify the investment in the ERP system but also to define what will constitute ERP success” (Kimberling, 2013). xPharma evaluated the IT organization against their ability to achieve all of their KPIs, but in following this industry trend, xPharma valued ROI more heavily than the other KPIs. Specifically, xPharma considered the ERP programs a success if they were able to achieve 4 out of the 7 KPIs, but ROI/Benefits Realization

was a mandatory KPI that needed to be achieved in addition to 3 other KPIs before the program could declare victory. Here's how xPharma's Finance and HR ERP deployments fared against their KPIs:

Service Level Agreement (SLA) Category	Key Performance Indicators (KPIs)	Measurement	Target Service Level	Finance	HR
Timelines	Target Milestone Dates	All program milestones delivered on or before approved target dates	100%	Achieved SLA	Achieved SLA
Finances	Budget Variance	Spend is within plus or minus 10% of approved budget	+/-10%	Achieved SLA	Achieved SLA
Quality	Volume of Defects	Percentage of critical or medium impact issues detected post production release	<2%	Did not Achieve SLA	Achieved SLA
Incident Management	Response times to incidents	All critical and medium priority tickets are resolved within 24 hours of raising	<24 hrs	Achieved SLA	Achieved SLA
Change Management	Organizational Readiness	Percentage of staff trained ahead of ERP implementation	≥80%	Did not Achieve SLA	Achieved SLA
Voice of Customer (VOC)	Overall Customer Satisfaction	Percentage of staff that would recommend ERP solution to a friend	≥90%	Did not Achieve SLA	Did not Achieve SLA
Business Case/ROI	Benefits Realization	Percentage of Soft and Hard Benefits are realized within projected realization dates	≥90%	TBD	Achieved SLA
Program deemed a success (Yes, No, or TBD):				TBD (pending ROI readout)	Yes

Figure 5: xPharma's R&D ERP Scorecard

As the scorecard unveils, the jury is still out on whether the Finance implementation will ultimately be considered a success or not, given the benefits are expected to be realized

12 months post deployment and the software has only been in production for 6 months as of April 1, 2015. Albeit, there is already evidence to suggest that both the R&D Finance and HR deployments both had elements of their programs that went well (as indicated in the “Achieved SLA” cells), and there is also data to support that the Finance deployment experienced shortcomings (“Did not Achieve SLA”) in areas where the HR deployment excelled. Some of the Finance deployment struggles can be attributed to it being a more complex endeavor than the HR implementation (moving from 75 legacy Finance systems to 1 vs. the HR program entailed moving from 50 legacy systems to 1), but there is also a correlation between the successes experienced as part of the HR deployment and the proactive measures taken by their IT Governance Board to collect learnings from the Finance ITGB (i.e. what worked well? what did not work well?) and refine their HR ITGB strategy to ensure they did not repeat missteps from the Finance program.

2.3 Methods

To quantify the impact effective ITG had on the Finance and HR ERP programs, we conducted a side-by-side comparison of the decisions made by the Finance ITGB and the HR ITGB, and assessed whether those actions positively or adversely impacted their respective program’s KPIs. In response to the abovementioned risks highlighted in the *Joint R&D ERP Programs Risk Registry*, the Finance and HR ITGBs had critical decisions to make as to how they would respond to each of the program risks.

2.4 Analysis and Interpretation

The following assessment how their responses ultimately affected the outcomes (KPIs) of their respective programs:

Risk (summarized from Figure 2)	Finance ITGB Risk Response	Effectiveness of Finance ITGB Response	HR ITGB Risk Response	Effectiveness of HR ITGB Response
R1) The Board of Directors and Executive Team selected a one size fits all ERP system...	Requested 27 customizations to template and only 7 were approved by executive team, so 4 “nice-to-have” business processes were retired & the other 15 “should have” & “must-have” processes will continue to be supported in the legacy systems	Ineffective: Overall Customer Satisfaction diminished with only 75% of the organization responding that they would recommend the ERP solution to a friend	Not Applicable – this risk is unique to the Finance program	Not Applicable
R2) Lack of quality documents & SMEs of legacy HR systems & processes...	Not Applicable – this risk is unique to the HR program	Not Applicable	Partnered with contractor organizations to find former xPharma employees who had domain knowledge of the HR systems & processes	Effective: Mitigated high impact Quality risks, and program met its KPI whereby <2% of the defects were High-Medium impact tickets
R3) Timelines for the ERP production releases set by xPharma’s executives...	Only approved projects at Stage Gates if scope was limited to solely moving from one technology to another to thwart scope creep like enhancement requests. Any proposals to change requirements had to be approved via a Change Control whereby only the ITGB could approve the change	Ineffective: Overall customer satisfaction was only ~75% b/c process enrichments were desired	Same as Finance ITGB	Ineffective: Same net affect as Finance program
R4) Legacy and ERP technology	Secured as many high talent resources as	Ineffective: Volume of Defects KPI	HR ITGB also blitzed the upfront reqs., but	Effective: Volume of critical-

not fully understood...	possible to help with the upfront analysis, but given R3, the ITGB had to eventually transition to execution with their requirements (reqs.) only 80-90% complete. This posed a high probability risk the programs would go live with defects	was not achieved with ~150 defects present at Go Live; 30 were critical-medium impact (18% higher than SLA)	they bolstered their approach by phasing /splitting their deployment schedules to deploy changes iteratively	medium Defects was <2% of defects with only 12 defects in total and none critical-medium tickets raised
R5) Resource talent tappers off before closure...	Negotiated in contract terms and conditions with consulting agencies that they would not be compensated unless all deliverables were in place including closure activities	Effective: Achieved SLA by delivering 100% of programs' deliverables by their Target Milestone Dates	Same as Finance ITGB	Effective: Same net affect as Finance ITGB
R6) Too much change left little time for proper training and change management..	Enforced all future users of the Finance SAP software to take mandatory e-learning training and pass examinations before they were able to use the system. Relied on word of mouth and a top down (management cascade) of communications	Ineffective: Diminished Overall Customer Satisfaction with only 27.5% of staff felt they were well prepared for SAP	The HR ITGB also enforced mandatory training but also leveraged an array of training mechanisms and They also implemented a viral comms approach leveraging an array of mediums to reach as many xPharma staff as possible	Effective: 92% of the organization responded that they were well prepared for Workday changes

Figure 5: R&D ERP ITGB Effectiveness Analysis

Per Risk 1 (the Board of Directors and Executive Team selected a one size fits all ERP system...): the ITGB is only as effective as their span of control can reach. Despite having some of the most senior thinkers in a business unit on a steering/governance

board, the reality is some organizations value some business unit's inputs more than others. In xPharma's case, the IT organization is considered a support organization, and there Chief Information Officer (CIO) is three levels removed/below the board of directors and two levels below the Chief Executive Officer and his executive team. It would be convenient for the purposes of this study to say the R&D Finance ITGB made missteps in their response to this risk as it would suggest gaps in ITG affect a program's success, but the consensus amongst xPharma's R&D Leadership Team (senior executives who evaluated the R&D ERP program teams' performance) is the measures taken by the R&D Finance ITGB may not have been enough to completely mitigate Risk 1 but no action at all would have completely derailed the program from going forward. The 7 template changes were absolute necessities in order for R&D to be able to operate in the new SAP system. Since R1 could not be mitigated fully, the Overall Customer Satisfaction diminished with only 75% of the organization responding that they would recommend the ERP solution to a friend, which is 15% lower than their KPI SLA.

Risk 2 (lack of quality documents & SMEs of legacy HR systems & processes...): the HR ITGB was able to locate some former xPharma employees that worked in the HR domain through LinkedIn, and partnered with their consulting alliances (Accenture, Cognizant, etc.) to reach out to these employees and bring them in as contractors through their organization to work on this program. Some of these resources have left xPharma because of performance reasons, others for other employment opportunities, some for retirement, and everything in between, so the talent pool varied resource to resource. Notwithstanding, the overwhelming feedback from the R&D Leadership Team is the HR ITGB used innovation to mitigate a significant threat to the quality of the Workday

deployment. The program met its KPI whereby <2% of the defects were High-Medium impact tickets.

Risk 3 (timelines for the ERP production releases set by xPharma's executives...): like Risk 1, the executive team's plans trump the IT organizations, and both the Finance and HR programs had little options other than to accept these risks and do everything in their power to minimize the impact to the organization (AKA collateral damage). In this example, it physically was not possible to deploy all must-have and should-have requirements within the timelines set by the executive team, so limiting the scope of the deployments was a sound tactic to ensure timely delivery, but it came with a transparent cost – diminished overall customer satisfaction. Whenever you crack open the hood of a system (whether it be a business application, a car, etc.) ideally one would look to fix or improve as many things as possible to get the system running optimally; however, adding these other fixes and enhancements come with timeline and cost implications that not all companies, car owners, etc. can entertain. In an IT project, a popular pit fall is scope creep, where additional requirements are added to the project after project approval (Stage Gate 2). The drivers behind the executive team enforcing such stringent and arguably unrealistic expectations on the organization are a result of their research into what makes an ERP deployment (or any large IT project for that matter) successful and why they fail. xPharma, a loyal consumer of Gartner services, follows Gartner's project management best practices: "to optimize success, look for ways to limit the size, complexity and duration of individual projects."(Mieritz, 2012). McKinsey consulting elaborates: large IT projects fail more often and deliver less value than smaller projects. A joint McKinsey and the University of Oxford study found IT

projects with budgets over 15 million dollars run 45% over budget, 7% behind schedule, and deliver 56% less functionality than forecasted (Wailguim, 2009). During the requirements gathering phase of the programs, the Business Analysts (BAs) and Business Consultants (BCs) documented dozens of examples where the business didn't currently have a feature/capability in their legacy system, yet they listed these functions as must have requirements. It also was not uncommon for the requirements to evolve over time where "nice to haves" became "must haves" and new requirements were added during execution (UAT is a popular time for new requirements to surface). The R&D HR ITGB was able to intercept such instances and reject the requirements through the ITGB Stage Gate and Change Control protocols. Without senior oversight of the requirements and scope of work would have been significantly larger. It is estimated that the R&D ERP ITGBs rejected approximately 20% of the requirements per program. Twenty percent of a 2.5 billion dollar Finance program and a 500 million dollar HR program that run 5 and 3 years respectively, would have cost xPharma an extra 50 million dollars and an extra year to deliver the Finance program, and an additional 10 million dollars and take an extra half year to deliver. This is significant money and time to even a large pharmaceutical company like xPharma.

Risk 4 (legacy and ERP technology not fully understood...): post production issues were significant for the Finance implementation with 150 incident/problem tickets logged in the R&D organization within the first month of Go Live, while the HR deployment logged only 12 incident tickets in the R&D organization. The HR ITGB took a conscience decision to not work up to the deadline and do a one fell swoop deployment as the Finance program did. It decided to phase /split the deployment schedules of its

projects and deploy changes iteratively. Having led both Waterfall and Agile projects as a former Project Manager, we were able to assess which methodology we thought would give our HR program the best chance for success, so we found project resources that knew how to run Agile projects and the results were favorable. Having iterative releases enabled us to prioritize deployments (deliver more value more quickly), spread the risk of the deployments (allows ability to fail earlier and smaller than large deployments), and it allotted the teams more time to assess the complex requirements and move those releases to a later date. The R&D HR projects and the consultants signed off/approved at Stage Gate 2 that they were 90-100% confident in their requirements. The low number of total defects recorded from the HR program demonstrates the actions taken by the ITGB were effective in driving comprehensive, high quality requirements that ultimately resulted in a higher quality end product.

Risk 5 (resource talent tappers off before closure...): both programs worked with the Project Management Office (center of excellence that drives program/project best practices) to add terms and conditions to their contracts with xPharma's consulting partners (e.g. Accenture, Cognizant Technology Solutions, etc.) to ensure all deliverables were met (including closure activities) before the vendors could be compensated.

Because the programs run over multiple years, there is no guarantee that the consulting agencies can retain the same consultants from start to finish, so the ITGBs negotiated that any loss in productivity as a result of resource turnover would be at the vendors' expense. The Finance ITGB had to execute this provision in the contract and demanded the contractor bring back some of their key resources to complete documents before they were compensated. Both programs achieved their SLAs by delivering 100% of programs'

deliverables by their Target Milestone Dates through the measures taken to retain resources through the duration of the project and tie compensation to deliverables. The contributions the ITGBs made by effectively responding to the closure risks are considerable. According to CIO.com, 54% of IT projects go over time and budget (Mieritz, 2012).

Risk 6 (too much change left little time for proper training and change management...): both programs mandated training and examinations, but the Workday solution delivered 45 days after the SAP solution, so based on the negative voice of customer raised around how cumbersome and ill-timed the training offerings were for the Finance program, the HR ITGB refined their training approach. Specifically the HR ITGB offered earlier training engagements through various training mechanisms (e-Learning courses, instructor led training, and self paced training materials like FAQs). The Finance ITGB change management approach received a black eye with negative VOC where 30% of xPharma's staff responded that they felt there was inadequate/impersonal communications around what the move to SAP means for them, and 25% of the staff felt the 2 day mandatory training was too onerous with all other organization changes going on concurrently that they also need to comprehend. The combined overall readiness score was 27.5% felt they were prepared for the SAP implementation (well below the target SLA of 80% readiness) Furthermore, the SAP training course offerings were only available in August (the month before Go Live), which is peak vacation season. It is common for Europeans to take the entire month of August off. The HR ITGB established a more robust stakeholder communications plan which included early and often engages through various mediums including: monthly

newsletters with countdown to go live details, social media posts, leadership team presentations, road shows at xPharma's cafeterias so staff did not have to use valuable meeting hours to learn about Workday, etc. These ITGB measures did not go unnoticed by the organization. After Go Live, all 100,000 xPharma staff were polled and roughly 20%/20,000 responded to the surveys with overwhelmingly supportive VOC: 92% of the organization responded that they were well prepared for Workday changes exceeding the Organizational Readiness KPI SLA by 12%.

3. Literature Review

3.1 Literature Review Context

When I first took the assignments of Business Consultant and IT Lead on two large scale ERP programs, the first thing I did was conduct a SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis on ERP programs (with a particular focus on large companies that are comparable in size to xPharma). Before looking inward at how well positioned xPharma was to take on these ERP programs (AKA the Strengths and Weaknesses), I researched what made other companies successful in their ERP programs (Opportunities) and what were some of the key reasons why ERP deployments fail at others (Threats). This literature review examines critical ERP success factors from both journal publications as well as articles from key opinion leaders (KOLs) in the IT industry.

3.2 The role of IT Governance through the Program Lifecycle

Most companies have some form of ITG present on their IT programs but only at certain stages in the program's lifecycle. It is popular for companies to have governance at the start of development (planning) and at the end (closure) but sparse governance in the initiation and execution phases of the program. The literature reviewed suggests each phase of a large IT project (especially an ERP program) has risks, and those companies with inadequate governance to help mitigate those risks fail more often than those companies whom have a governance presence cradle to grave (initiation through closure). KPMG, an audit, tax and advisory firm echoed this point in stating "effective governance

needs to run end-to-end, and while rigor might surround the initial approval of funds, governance tends to fall away” (Zarrella, 2005). Following the theme from the xPharma ERP case study, the role of ITG throughout the program lifecycle is investigated.

In several articles, KOLs identify a lack of ITG at the onset/initiation phase of an ERP program as a common pitfall for organizations attempting to kick start an ERP program. In a study where researchers assessed the impact critical success factors have across the program lifecycle stages of enterprise resource planning implementations, the authors declare the most critical phase in an ERP implementation is during initiation when the selection of the software package and the preparation to make the selection take place (Somers and Nelson, 2001). One of the most common mistakes companies make is in their decision as to which ERP solution is appropriate for their organization. ERP software providers like SAP and Workday devote a lot of resources to forging alliances and wooing executives on why their products are best in bread and offer irrefutable benefits. In xPharma’s case, several investment firms put out guidance to investors that buying shares in xPharma is a risk because xPharma has a marginal ERP footprint and its competitors are much further along in the ERP arms race giving them a competitive advantage over xPharma. With the allure of significant positive ROI through process efficiencies and reduced IT overhead, in juxtaposition with the demands from shareholders, xPharma set out on a 5 year 5 billion dollar ERP journey to move the company to SAP and Workday. The decision which software to select for the Manufacturing & Supply Chain and Finance organizations was a joint CIO and CEO decision to adopt SAP, however, the decision to move to Workday rested solely with the CEO. It is common knowledge at xPharma that CIO opposed this decision as SAP offers

HR services and Workday is a cloud based, peer-to-peer application (both of which are outside of xPharma IT's comfort zones), but the CEO found the price tag and user interface of Workday to be more attractive than SAP. The CEO also had final say on which software version xPharma would deploy and how many customizations and configurations could be accommodated. The decision to adopt a single template for all four of its business units, for example, was a decision that the IT organization was never able to fully recover from, and business benefits were diminished as a result. In order to keep the business running, IT had no choice but to keep the legacy finance systems running in parallel until the ERP systems meet the business requirements. The ERP business case rested largely on projected savings from process efficiencies moving to a single system with standardized processes and reduced TCO/on-going support costs of legacy systems that are expected to be retired. Through the literature review, it became evident other companies reduce their chances of being successful in their ERP endeavors because non-IT executives make IT decisions when in best practice it should be a joint organizational governance (executive level) and IT Governance agreement. In *The Role of Governance in ERP System Implementation*, the author states, "IT governance is not an isolated activity but is an integral part of organizational governance because it provides direction, through the implementation of an IT strategy" (Fitz-Gerald, 2003). Selecting the wrong ERP solution can derail an ERP program before it even gets started, hence why ITG through the initiation phase, including ERP software selection, is critical to the program's success. CIO.com lists poor [system] planning as the number one ERP mistake companies make; specifically, companies select ERP solutions yet they do not fully understand their current processes nor do they know how to evolve them to maximize the

efficiency benefits offered with an ERP solution (Shiff, 2012). Researchers from Bar Ilan University articulate the impacts of selecting the wrong ERP system further:

“Companies often suffer poor fit between ERP system and organization. A misfit between the best practice processes implemented within the ERP system and the organization’s pre-implementation business processes leads to more software process customization, more cycles of reimplementation, greater complexity, increases in resources, and a longer project schedule.” (Shaul and Tauber, 2000)

Shaul and Tauber go on to recommend companies should establish a framework (like that of an IT Governance Board) to ensure sound leadership, project management best practices, data assurance, etc. are staples of the ERP programs. As mentioned in the Introduction to this paper, customizing an ERP system is a costly endeavor and is a catalyst/slippery slope to enabling the next high TCO legacy system at a company. Getting the ERP program off on the right footing and trajectory toward success during the initiation phase is a prerequisite to the subsequent phases in the program lifecycle. This sentiment is echoed in an article that researched ERP adoption lessons learned:

“preventing and resolving future problems must be taken well before the project phase even begins since in many cases only senior executives can address the preexisting organizational challenges that threaten ERP success” (Markus et al., 2000).

Again, the correlation between early engagement and effective governance (inclusive of leadership) is paramount to ERP success.

Assuming the ERP program survives the initiation phase, the planning phase where the project plans are created, the financial plans are solidified, the quality, risk and compliance plans (QRC) are agreed, etc. is also a critical phase of an ERP program that requires further ITG supervision.

“The importance of the planning phase is often disregarded in less successful ERP adoptions. In the planning phase, key business decisions related to the ERP

system are made, including business cases, user requirements, usage scenarios, operational requirements, and system requirements” (Shaul and Tauber, 2013)

The effort put in during the planning phase of a program is a significant undertaking and the duration of this exercise can span months to years. It is essential to have milestones and timelines established during the planning phase as the teams would spend as much time as allotted to further refine requirements, get additional clarity, confirm assumptions, etc., but eventually the programs need to deliver. The ITGB plays an integral part in setting analysis and planning parameters and milestone (e.g. in 4 months from Stage Gate 1 the Business Requirements must be between 95-100% complete, and the project costs and timelines 90% accurate). Limiting the scope of a program is one of the most tangible contributions an ITG team can make to a program (the smaller the project the higher the success rate).

The role of IT Governance through the execution phase is to ensure the projects deliver what has been agreed in the planning phase, stays within the budgets and timelines, and meets the final product meets the business expectations. Giga Research expands on the role of ITG through execution by also calling on the ITG Boards to maximize resources, work with the PMO to ensure the portfolio is balanced, and drive project management best practices (Leganza, 2003). During execution, particularly UAT is a popular time for the business to add additional requirements to the scope, and it is imperative the business has oversight and a strict change control process in place to prevent any scope increase requests. Once the changes go into production, IT Governance will play a very active role in helping assess, diagnose, act and monitor any post production issues as well. In a case study where researchers assessed the role of ITG post

–ERP implementations, they found when senior leaders were engaged throughout the program, post deployment issues were identified sooner and resolved faster than programs that had disparate ITG engagements with the programs.

During the project closure phase, the post production issues should have tapered off at this point (if issues persist it is unlikely the IT backend support division will accept project closure), and the ITG role will be focused on continuous improvement of what has been delivered, ensuring documentation quality and completeness are delivered, lessons learned are captured, transitions to steady state support are seamless, etc.

3.3 Why ERP Deployments Fail and How ERP Deployments Succeed

IT Governance is not a novel concept to the IT industry; but rather a growing necessity for companies to get right as the demands for integrated enterprise technologies grow. In *Attempting to Define IT Governance: Wisdom or Folly?*, the authors comment:

“Since the 1990s ITG has been a concern. However, good ITG is no longer a ‘nice to have’, but a ‘must have’ and can contribute to higher returns on assets at a time when business is spending increasing amounts on technology investment” (Webb, Pollard, and Ridley, 2006).

Gartner further confirms that ITG has been recognized as a CIO top-10 issue for more almost a decade and is steadily rising in priority each year. IT leaders with the ability to shepherd programs through the intricacies and challenges large IT programs pose is part of the ITG value proposition; equally critical is the ability to have clear accountabilities established and decision makers lined up to help knock down barriers and keep the business goals and the IT program deliverables aligned. In a 2004 the Harvard Business School Press put out an article that concludes companies with the same strategic objectives yet one has strong governance and the other has weak governance, the

company with superior governance is expected to earn at least 20% higher profits than (Weill and Ross, 2004). Companies are starting to acknowledge IT Governance contributes

4. Methodology

4.1 Study Set Up

In recognition that a case study in isolation has confines in that they focus on a limited data set in a particular setting that may not resonate with a broad readership, a complementary literature review was also conducted to bridge the gap between being too narrowly focused on a few data points vs. being too theoretical with a macro level literature review on the subject. As mentioned in the literature review, I of n effort to provide both a micro analysis of two real ERP focus into a real world the limited data sets offered with a case study and the theoretical nature of literature reviews a study aIn recognition that case studies alone are often perceived as being too narrowly focused with a limited data set based on the researcher's specific setting, and a literature review in isolation is arguably too theoretical to be used as a mature framework for field work, the two research approaches were brought together into one comprehensive, practical assessment for aspiring ERP program leads and ERP stakeholders.

4.2 Case Study Data Set

The case study follows to In following the generic/IT industry standard lifecycle of a program or project of work (initiation, planning, execution, and closure), the hypothesis is there are key decisions made by those accountable for the IT Governance throughout each of these phases in the lifecycle. The case study examined those decisions or "risk responses" and quantified the effectiveness of those decisions by measuring the impact to the KPIs. by e 2 ERP deployments (Finance – SAP and HR – Workday) at

xPharma and how those decisions either positively contributed to or adversely impacted the respective programs success measures (i.e. KPIs). The IT Governance Board (ITGB) at xPharma. At xPharma, when a software is released to a user community the entire user community is polled to gauge customer satisfaction. On average, only twenty percent of those polled respond. In the

4.3 Literature Review Data Set

Both the Association Computer Machinery (ACM) and Library and Information Science Abstract (LISA) databases returned dozens of articles when the search terms “IT Governance” and “ERP Programs” were queried with several articles that support my hypothesis. Additionally, we in the IT industry (particularly in the pharmaceutical sector) rely heavily on outside industry analysts and strategists like McKinsey & Company, Gartner Inc., etc., so I also leveraged online publications on the topics of IT Governance and ERP Programs.

4.4 Tools Used

The program/project lifecycle, the IT Governance Board framework, and success measures/KPIs (the SLAs were customized however) were generic industry recognized tools. The only tool that was customized was the risk registry (albeit risk descriptions, impact, and risk responses are common features used by Project Management Offices).

5. Results

5.1 Case Study Results

Per Risk 1 (the Board of Directors and Executive Team selected a one size fits all ERP system...) Results: Only 75% of the organization responding that they would recommend the ERP solution to a friend, which is 15% lower than their KPI SLA. This is attributed to the ineffectiveness of the Finance ITGB to be able to influence the scope of the ERP program to include more SAP template changes.

Risk 2 (lack of quality documents & SMEs of legacy HR systems & processes...) Results: The HR ITGB was able (effective) to find SMEs to help bridge knowledge gap and as a result delivered the ERP solution with <2% of the defects being High-Medium impact tickets.

Risk 3 (timelines for the ERP production releases set by xPharma's executives...) Results: Both ERP programs limited the scope of the project to must have and should have requirements, and the Overall Customer Satisfaction for both programs was only around 75% of the organization being willing to recommend these ERP solutions to a friend (15% below the 90% target SLA) and the trends captured in the comments section indicated the customer was disappointed the systems do not meet all of their requirements. Neither ITGB were effective in influencing the timelines and scope of their programs limiting them to rationing the requirements that would be delivered.

Risk 4 (legacy and ERP technology not fully understood...) Results: there were 150 incident/problem tickets logged in the R&D organization within the first month of

Go Live of SAP with 30 critical-medium impact tickets logged (18% higher than SLA). The HR deployment logged 12 incident tickets within the R&D organization with 0 critical-medium logged (achieved SLA of <2% of defects being critical-medium impact). This is attributed to Finance ITGB only having ~90% confidence in requirements and moving into execution to meet the timelines, and the HR ITGB moving to an agile methodology to deliver and assess in parallel.

Risk 5 (resource talent tappers off before closure...) Results: Finance and HR programs achieved their SLAs: 100% of deliverables delivered on time as a result of ITGB response to tie compensation to deliverables.

Risk 6 (too much change left little time for proper training and change management...) Results: Per the Finance deployment: out of the 100,000 employees polled, 30,000 (30%) felt there was inadequate communications and 25% of the staff felt the raining was too onerous and inconveniently scheduled. The two scores were averaged together to arrive at only 27.5% of staff were adequately trained before Go Live, which is well below target VOC of 90. This is attributed to the minimalist word of mouth communications strategy and training schedule oversight. Per the HR deployment: out of the 100, 000 xPharma staff were polled and roughly 20%/20,000 responded to the surveys with overwhelmingly supportive VOC: 92% of the organization responded that they were well prepared for Workday changes exceeding the Organizational Readiness KPI SLA by 12%. The results are tied to the ITGB robust/viral communications strategy and a more accommodating training approach to enable online, self paced, etc. training options.

5.2 Literature Review Results

The literature review suggests ERP Programs succeed when they have a comprehensive IT Governance model place and fail when they do not. Both researchers and KOLs from industry analysts and strategists converge on a common theme: ERP complexity requires senior stakeholder sponsorship and an efficient, participatory IT Governance team engaged through the life of the programs.

5.3 Convergences

Both the case study and literature review found strong evidence to suggest IT Governance is a critical success factor in ERP deployments. Per the case study, where there was ineffectiveness and gaps in ITG, the programs suffered in missed KPIs. The literature overwhelming suggested ITG voids are direct contributor to ERP deployment failures. The risks that came in fruition and materialized during the xPharma ERP deployments are common risks that other companies grapple with. For example, in both the case study and literature review, selecting the wrong technology, not fully understanding legacy and ERP processes and technologies, resources moving off the projects before closure, etc. are some of the top challenges ERP programs face that are often not overcome by many companies. In addition to the parallels between xPharma's ERP risks and those found in the literature review, is the commonality of how xPharma defined ERP success

5.4 Divergences

There were several articles that made very closely aligned inferences to that of my own (effective ITG is key to ERP success), while others listed ITG as one of many factors to the overall success of an ERP deployment. No literature found refuted the

hypothesis, but rather there were articles that put equal emphasis on disciplines like project management best practices, building strong relationships with the vendors, etc. Another common nuance between this study and what has been found in the literature review is several journal articles and websites generically suggest effective “IT leadership” is a critical success factor in ERP programs, which is implicit of IT Governance in this study.

6. Discussion

6.1 Significance

The results from both the case study and literature demonstrate a strong correlation between ITG effectiveness and ERP deployment successes. The case study and literature review converge/share several of the same conclusions surrounding the criticality ITG plays in ERP deployment outcomes, and they diverge infrequently and subtly. Readers of this study whom are embarking on an ERP deployment will at a minimum find practical examples of some of the challenges ERP programs pose and how effective ITG responses can affect outcomes.

6.2 Limitations

There are limitations to the case study in that most of the measures and conclusions shared are qualitative in that xPharma defined the success criteria and self evaluated whether the ITGB responses were “effective” or “ineffective. Another potential limitation is I was more intimately engaged on the HR ERP deployment where I was accountable for the ITG through the entire lifecycle vs. only being a contributor on two of the phases on the Finance program. This may introduce some bias in that I am evaluating many of my own decisions on the HR ERP deployment, vs. my reflections on the Finance ERP are potentially more objective as I was one of many decision makers on the ITGB. Another limitation is there were few examples found in the literature review that measured ITG effective quantifiably. Quantifying effectiveness in the case study was a

novel undertaking that could not be substantiated as a sound methodology since other researchers and analysts have not attempted this.

Furthermore, the Finance program has not completed their benefits realization analysis yet, because there is still another 6 months until the program is expected to realize its benefits. This means there is a subset of the data that is partial and cannot be used in this study. This was viewed as minor limitation to the study since metrics were available for the other six KPIs.

6.3 Future Works

I will be leading another ERP program in the fall of 2015 where xPharma will replace their legacy accounting systems with an enterprise solution. This will provide a third set of ERP data points to help further test my hypothesis. Moreover, by the end of 2015 we will also have full metrics on the business realization KPIs from the Finance program, so the data set will be more inclusive, which will enhance the case study.

7. Conclusion

The goal of this paper was to provide both a deep-dive assessment of 2 real world ERP implementations and to also assess what the leading IT industry key opinion leaders (consultants, researchers, etc.) feel are the keys to successful ERP deployments. Both the case study and literature review converge on the concepts of strong IT Governance devotion through the life of an ERP program exponentially increases the odds an ERP deployment will succeed. The next evolution of such a study is to dig deeper into how we as IT industry quantify the benefits of ITG (we see it work and feel its affects but how do we calculate these qualitative findings?) and share specific examples of where effective ITG helped resolve a significant risk, seize an opportunity, and be that true catalyst/engine for success.

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Appendix I

Glossary of Terms

IT governance (ITG): is defined as the processes that ensure the effective and efficient use of IT in enabling an organization to achieve its goals.

<http://www.gartner.com/it-glossary/it-governance/>

Software as a Service (SaaS): software that is owned, delivered and managed remotely by one or more providers. The provider delivers software based on one set of common code and data definitions that is consumed in a one-to-many model by all contracted customers at anytime on a pay-for-use basis or as a subscription based on use metrics. <http://www.gartner.com/it-glossary/software-as-a-service-saas/>

Enterprise Resource Planning (ERP): is defined as the ability to deliver an integrated suite of business applications. ERP tools share a common process and data model, covering broad and deep operational end-to-end processes, such as those found in finance, HR, distribution, manufacturing, service and the supply chain.

<http://www.gartner.com/it-glossary/enterprise-resource-planning-erp/>

Bespoke: The term "bespoke" comes from England where it originally referred to custom or tailor-made clothing. In recent years, however, the term has been applied to information technology (IT), and refers to custom services or products.

<http://techterms.com/definition/bespoke>

Program: a program is a group of related projects managed in a coordinated way to obtain benefits not available from managing the projects individually. A project, on the

other hand, has a defined start and end point and specific objectives that, when attained, signify completion.

Program Management vs. Project Management: Project managers manage and coordinate tasks and activities. They are team players who may contribute to deliverables and motivate through use of knowledge and skills. Program managers provide leadership and vision. They play the role of facilitators and coaches who can inspire and guide project managers and their teams to achieve the strategic goals of the programs.

http://www.pmi.org/eNews/Post/2008_08-08/NextLevelUp_RoleOfPogramManVsProjectMan.html

Business Processes: A series of related business activities aimed at achieving one or more business objectives in a measurable manner.

http://www.knowledgetransfer.net/dictionary/ITIL/en/Business_Process.htm

Total Cost of Ownership (TCO): a comprehensive assessment of information technology (IT) or other costs across enterprise boundaries over time. For IT, TCO includes hardware and software acquisition, management and support, communications, end-user expenses and the opportunity cost of downtime, training and other productivity losses.

Commercial off-the-shelf (COTS): an adjective that describes software or hardware products that are ready-made and available for sale to the general public.

<http://www.techopedia.com/definition/1444/commercial-off-the-shelf-cots>

Scope Creep: refers to a project that has seen its original goals expand while it's in progress. As the term suggests, scope creep is a subtle process that starts with small adjustments and ends up resulting in projects that take far longer to complete or even fail

before they are finished. Even if the project is completed, scope creep can result in final deliverables that look nothing like what was originally envisioned.

<http://www.techopedia.com/definition/24779/scope-creep>

Legacy system: in the context of computing, refers to outdated computer systems, programming languages or application software that are used instead of available upgraded versions. Legacy systems also may be associated with terminology or processes that are no longer applicable to current contexts or content.

<http://www.techopedia.com/definition/635/legacy-system>

Key Performance Indicators (KPIs): A set of quantifiable measures that a company or industry uses to gauge or compare performance in terms of meeting their strategic and operational goals. KPIs vary between companies and industries, depending on their priorities or performance criteria. <http://www.investopedia.com/terms/k/kpi.asp>

Stage Gate: used to describe a point in a project or plan at which development can be examined and any important changes or decisions relating to costs, resources, profits, etc. can be made. <http://dictionary.cambridge.org/us/dictionary/business-english/stage-gate>