

Technology Business Management as a Driver of IT Governance, Risk, and Cybersecurity Improvement: A Case Study of Integrating TBM with COBIT Framework

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Abstract: In this case study, we evaluate the benefits of implementing a Technology Business Management (TBM) tool at Leovia North America. TBM is a methodology for leveraging data from Finance, IT Infrastructure, IT PMO and Applications to develop a real-time mapping of IT costs to services. We also highlight where IT governance framework COBIT and its control objectives related to risks and cybersecurity are addressed by TBM, in order to prove the framework's strategic value creation potential.

Key words: IT governance, technology business management, data, risk management, cybersecurity.

1. Introduction

Leovia North America (LNA) helps customers address their environmental and sustainability challenges in energy, water and waste, and includes approximately 7,900 employees in the U.S. and Canada. LNA is organized into two main businesses, Municipal & Commercial and Industrial, and provides its customers a complete range of environmental solutions to meet the challenges of cities, governments, campuses, businesses and industries.

At LNA, IT costs are allocated back to the business as overhead based on high-level metrics: primarily number of IT users and revenue. The corporate IT budget and forecast are scrutinized at the line item level of the general ledger, but without a link between raw costs and the operational groups' requirements for IT services there exists a disconnect between the value the business stakeholders demand vs. the dollar level of investment the IT organization requires annually. The CIO is challenged with questions from executive management and operations management as a result:

- When can we expect decreases in the IT budget?
- Why do we own a datacenter and should we not be leveraging a cloud?
- Is our investment supporting an agile architecture that will support IT of the future, including Internet of Things (IoT) and Blockchain opportunities?

These questions can be answered today through a lengthy process of data gathering and analysis, but these are not one-off information requests. These are questions of strategic direction for which the organization should be able to provide regular updates. To provide such analysis, improvements must be made to the process of IT Financial management to provide more transparency.

It is proposed that Leovia NA adopts a Technology Business Management (TBM) model to achieve the

desired transparency. Using TBM, costs of IT are mapped and assigned to a service catalog in order to demonstrate to operations management the cost of doing IT business. The IT organization is also able to show executive management how the high level IT investment breaks down into the total cost of ownership for the IT systems and applications that support critical business processes. In the following discussion the relationship of TBM and the internationally-accepted COBIT 5 IT governance framework are explored in more detail in order to demonstrate that a TBM implementation not only addresses the tangible objective of cost analysis and reporting, but also supports an overall robust IT governance model [1].

2. Current State: IT Budget Break Down

The LNA IT budget is not unlike many other IT organizations that includes the following summarized general ledger (accounting) line items: salaries (internal labor) and temporary labor, third party consulting fees, personnel training and admin costs, software and hardware maintenance contracts, WAN and Internet costs, datacenter facility costs (building maintenance, taxes and utilities), and asset depreciation (software, hardware and building assets). These costs are vertically split by Infrastructure, Application, and Management IT functions.

The infrastructure side of IT has an annual operating budget of about US\$12M. Including labor and personnel costs, infrastructure is broken down further into the following cost centers:

- Datacenter facility—building, racks, AC equipment, and electrical infrastructure;
- Servers—including physical and virtual servers, storage hardware
- Database—including database tools and related maintenance
- Network—including hardware, software and related maintenance; also WAN and Internet Infrastructure, VoIP
- Cybersecurity—including incident response and security operation center for security incident and event management (SIEM)
- End User Platform—including licensing of workstation and application, and hardware maintenance
- End User Support—including the helpdesk ticketing software and maintenance

The applications side of IT has an annual operating budget of about US\$15M, and includes labor and personnel costs, software licensing and maintenance costs. There are not detail cost centers established to capture costs by groups such as infrastructure, but major business applications and systems that are supported can be categorized as follows:

- Operations or “front-office” applications such as billing systems, maintenance systems, and reporting systems
- Business Intelligence
- “Back-office” support systems including ERP; P2P; Payroll; Gmail (corporate email). Note that some of these systems are supported internally, while others are externally sourced via the parent company in France or the public cloud.

3. Technology Business Management

TBM is defined as the adoption of tools and processes to shift the management of technology costs to technology value, enabling and supporting the acceleration of the business technology agenda [2]. TBM leverages data from Finance, IT Infrastructure, IT PMO, Applications and the business to develop a real-time mapping of IT costs to services. When properly implemented the TBM framework provides transparency of costs, which means assigning value to IT services that are visible from the perspective of their stakeholders. This common understanding of IT allows the organization to realize many benefits such as [3]:

- translating costs into actionable insights IT and their stakeholders;

- accelerating IT planning and effectively communicating the budget;
- replacing emotions and assumptions with facts about value and tradeoffs;
- building trust and modifying behavior with defensible cost allocations;
- optimizing costs and rationalizing applications and vendor portfolios;
- improving agility by providing accurate insight into the cost of various options; and
- aligning technology investments to business priorities

To sum it up, it is all about providing transparency of enterprise IT costs so that the business stakeholders can make informed decisions that support the enterprise objectives.

At LNA, the previously discussed IT budget can be translated to the TBM framework according to the particular service architecture of the IT organization. Service architecture is the manner in which IT activities flow to IT services in a progressive manner. Typical service architecture is comprised of the 4 types of services: IT, application, information, and business services [2]. The flow of costs as they begin to be allocated to IT services can be visualized better by establishing infrastructure “towers”. Imagine a schedule including rows for the general ledger line items mentioned in the “budget” discussion above, where those line item costs are split among columns for each of the major infrastructure cost centers listed. These columns are our infrastructure “towers” and “sub-towers” [3]:

- Datacenter facility costs
- Compute—including sub-towers for server platforms (Windows, Linux, etc.), Database, cloud platforms, and if applicable middleware or SOA solutions
- Storage—including sub-towers for tiers (gold/silver/bronze) and cloud storage
- Network,—including sub-towers for WAN, LAN and VoIP
- End User—including sub-towers for costs of workstation platforms, and support center
- IT risks and cybersecurity
- IT management and Admin

These towers hold the calculation and allocation of IT costs services for IT—it is the IT portion of service architecture and the first layer of cost allocation. Now, these towers are drawn from to provide for application, information and business services. For example, the billing software used by the LNA Industrial Services business runs on Linux servers and uses tier-one storage. The software also benefits from the enterprise security and end user support systems in place. These aforementioned costs have been standardized in the infrastructure towers and now we can assign them accordingly. We must also apply direct costs of the application such as the license costs and software maintenance, as well as the cost of labor of our apps personnel who support the application on a regular basis. These costs are coming from the other US\$15M of budgeted spend related to the Applications side of IT, described earlier. Once we have achieved this next level allocation, we now have a better picture of the total cost of this billing application. Note that this next level of cost assignment will require a rather detailed mapping of applications and services to servers, databases, storage, etc. This is the IT service architecture –the discovery of this architecture is a major requirement of a successful TBM implementation.

4. COBIT 5 and TBM

We have discussed exclusively to this point TBM and how it is proposed to be applied within LNA. TBM is not meant to be an all-encompassing governance framework such as ITIL or COBIT; however it does leverage and apply key components of these frameworks in order to provide value. In particular if we examine the TBM initiative through the lens of the COBIT 5 principles, enablers and process models the link becomes clear. TBM may not be an overall governance framework on its own, but its implementation at LNA will bolster governance objectives and help the IT organization mature, evolve and integrate better into the

company operations.

Principles and Enablers

COBIT 5 is based on five key principles for governance and management of enterprise IT, and 7 categories of Enablers that can help achieve the objectives of the organization [4]:

- 1) *Meeting stakeholder needs*—create value for LNA IT stakeholders by maintaining balance between benefits and risk. TBM by definition is about clearly defining technology value, which is imperative for demonstrating value to the stakeholders. When everyone is clear about the value and underlying cost of IT services, constructive conversations ensue.
- 2) *Covering the enterprise end to end*. The TBM framework promotes this COBIT principle in the fact that it brings together the separate realms of financial, IT, and business – Fig. 1 below illustrates the separate realms of these areas that are bridged by TBM [5]:

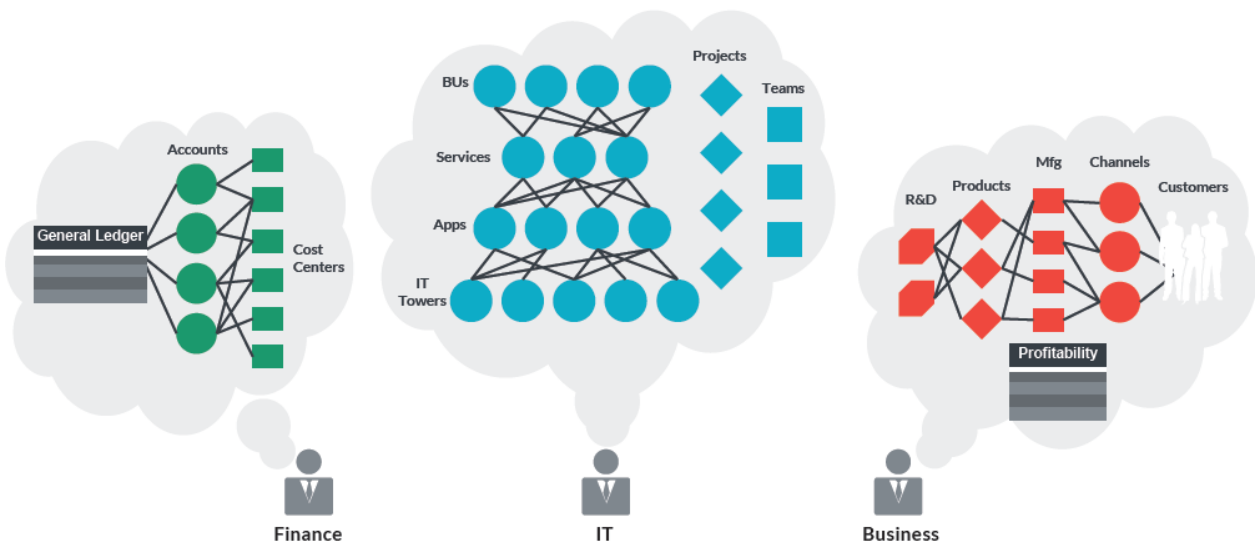


Fig. 1. The technology business management (TBM) framework.

By clearly showing the flow of IT costs from general ledger, to IT activity, to applications, services and business processes, this is how TBM demonstrates the value IT services to the business. A taxonomy has even developed as common reference for all stakeholders to use to ensure all are talking the same language and rely on common reports, metrics, and other outputs of the TBM model [5].

- 3) *Applying a single integrated framework*: COBIT 5 is designed as an overarching framework that incorporates many other IT standards and practices. TBM can be seen as another such standard and/or practice fitting its framework within COBIT 5 as this paper is asserting.
- 4) *Enabling a Holistic Approach*: COBIT 5 uses a set of 7 enablers to support the implementation of a comprehensive governance program. A TBM implementation at LNA can actually enhance the effectiveness of many of these enablers and bolster IT governance as a result:
 - a) *Principles, Policies and Frameworks* – The TBM framework, as mentioned above, will help bring together finance, IT and business objectives by having each look at the same information and taxonomy.
 - b) *Processes* – the mapping of service architecture at LNA IT during a TBM implementation actually clarifies processes and allows them to be more useful as enablers for driving IT value.
 - c) *Organizational Structures*: The IT cost mapping provided by TBM allows business, finance and IT leaders realize the impact their decisions can make on services and value, empowering them to leverage this enabler to optimize IT services and value

- d) *Information*: Utilizing multiple sources of information from IT, management, including the Configuration Management Database, Project portfolio, Help desk ticket system, Asset ledger and accounting general ledger, TBM acts as a system of systems to provide all stakeholders a dashboard of how IT is performing financially. In turn, gathered data from multiple organizations (Big Data) can be leveraged to provide benchmarking data. The wealth of information provided as output becomes one more key enabler to improving and optimizing the LNA IT organization.
 - e) *Services, Infrastructure and Applications*: by illustrating the tangible value of LNA IT services, IT and stakeholders will be able to make more informed decisions about the utilization and lifecycles of underlying IT assets. This enabler is thus enhanced by the TBM implementation.
 - f) *Culture, ethics and behavior*: While maybe no direct impact, the adoption of a framework sends a message of discipline that can be helpful to the LNA IT organization.
 - g) *People, Skills and Competencies*: Perhaps there is not a direct impact on the skill set of the LNA IT teams, however the information available for the TBM outputs will allow the IT teams to be better informed about the financial and value impacts of their activities—something for which they currently do not have much accountability.
- 5) *Separating Governance From Management*: in COBIT 5 a clear distinction is made—governance to set direction, priorities, and monitor performance; management to plan, build, run and monitor activities. TBM will enforce this concept at LNA by making clear measurement of the financial performance of IT activities. Feedback to management regarding these activities allows them to measure the value of those activities to LNA operations and in turn optimize those activities in a continuous manner. The ongoing financial reports will also provide senior management the parent company management (the governing bodies) a very clear indication of the cost of applying their agreed-upon objectives for the business, with respect to IT.

5. TBM Mapped to Cascading Goals and the COBIT 5 Process Models

As illustrated above, effective financial management of IT is an overarching end-to-end process that supports IT governance. Financial management will be a major tool in delivering on the objective of meeting stakeholder needs through value creation. “Value creation means realizing benefits at an optimal resource cost while optimizing risk.” [4]. If LNA fails to meet stakeholder needs, IT fails in its value proposition to management and they will eventually need to make more drastic and/or expensive changes in order to achieve the necessary alignment.

With that in mind, we will now explore how COBIT maps stakeholder needs to IT related goals, and determine how that might map back to the benefits proposed by TBM. COBIT framework takes a methodical approach to demonstrate how stakeholder needs cascade to enterprise goals, then IT-related goals, and finally enabler goals. Let us follow this path by looking again at the questions the LNA CIO is faced with from upper management and operations (stakeholders), and in parentheses below the questions have been paraphrased as generic “stakeholder needs” [4] that COBIT 5 framework uses to map to enterprise goals:

- When can we expect further decreases in the IT budget?
(Are the total IT effort and investments transparent?)
- Why do we own a datacenter and should we not be leveraging a cloud environment?
(Am I running an efficient and resilient IT operation?)
- Is our investment supporting an agile architecture that will support IT of the future, including IoT and Blockchain opportunities?

(Are sufficient IT resources and infrastructure available to meet required enterprise strategic objectives toward smart waste management [6]?)

All these questions align with the enterprise goal of Financial Transparency. Financial Transparency in turn has a primary relationship to the achievement of Benefits Realization, as well as a substantial (secondary) relationship to the other two tenets of value creation: Risk Optimization and Resource Optimization, as illustrated in the excerpt table from COBIT 5, below [4]:

Figure 5—COBIT 5 Enterprise Goals				
BSC Dimension	Enterprise Goal	Relation to Governance Objectives		
		Benefits Realisation	Risk Optimisation	Resource Optimisation
Financial	1. Stakeholder value of business investments	P		S
	2. Portfolio of competitive products and services	P	P	S
	3. Managed business risk (safeguarding of assets)		P	S
	4. Compliance with external laws and regulations		P	
	5. Financial transparency	P	S	S

Fig. 2. COBIT 5 enterprise goals.

The enterprise goal of Financial Transparency also has a primary relationship with the *IT goal* of Transparency of IT costs, benefits and risk [4].

Figure 22—Mapping COBIT 5 Enterprise Goals to IT-related Goals																	
		Enterprise Goal															
		Stakeholder value of business investments	Portfolio of competitive products and services	Managed business risk (safeguarding of assets)	Compliance with external laws and regulations	Financial transparency	Customer-oriented service culture	Business service continuity and availability	Agile responses to a changing business environment	Information-based strategic decision making	Optimisation of service delivery costs	Optimisation of business process functionality	Optimisation of business process costs	Managed business change programmes	Operational and staff productivity	Compliance with internal policies	Skilled and motivated people
		1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
IT-related Goal		Financial				Customer				Internal				Learning and Growth			
Financial	01 Alignment of IT and business strategy	P	P	S			P	S	P	P	S	P	S	P			S
	02 IT compliance and support for business compliance with external laws and regulations			S	P											P	
	03 Commitment of executive management for making IT-related decisions	P	S	S					S	S		S		P			S
	04 Managed IT-related business risk			P	S			P	S		P			S		S	S
	05 Realised benefits from IT-enabled investments and services portfolio	P	P				S		S		S	S	P		S		S
	06 Transparency of IT costs, benefits and risk	S		S		P				S	P		P				

Fig. 3. Mapping COBIT 5 enterprise goals to IT-related goals.

What does all this tell us? If we want to answer the CIO's main questions and address LNA stakeholder needs, COBIT 5 framework has already identified these valid stakeholder inquiries and has guidance laid

out to assist management in the development of well-controlled activities. Let us now explore the COBIT 5 IT goal of Transparency of IT Costs, Benefits and Risk—this is the area that will lead us to specific COBIT Processes that will link us to the same goals and metrics LNA seeks to achieve with a TBM implementation.

The COBIT framework goes deeper into addressing IT goals by mapping them to enabler goals and COBIT 5 processes. The IT Transparency of Costs goal has a primary relationship to the following COBIT 5 governance and management processes:

- Evaluate, Direct, Monitor (EDM)02 Ensure Benefits Delivery;
- EDM03 Risk Optimization;
- EDM05 Ensure Stakeholder transparency;
- Align, Plan, Organize (APO)06 Manage Budget and Costs;
- APO12 Manage Risks;
- APO13 Manage Security;
- Build, Acquire, Implement (BAI)09 Manage Assets

A deeper analysis of these processes in ISACA's COBIT 5: Enabling Processes will reveal some more detailed goals and related metrics, which we can link back to our TBM benefits. Take for example the Process detail for APO06, per the COBIT 5 Enabling Processes document [4]:

Process Goal	Related Metrics
1. A transparent and complete budget for IT accurately reflects planned expenditures.	• Number of budget changes due to omissions and errors • Numbers of deviations between expected and actual budget categories
2. The allocation of IT resources for IT initiatives is prioritised based on enterprise needs.	• Percent of alignment of IT resources with high-priority initiatives • Number of resource allocation issues escalated
3. Costs for services are allocated in an equitable way.	• Percent of overall IT costs that are allocated according to the agreed-on cost models
4. Budgets can be accurately compared to actual costs.	• Percent of variance amongst budgets, forecasts and actual costs

Fig. 4. COBIT 5 detail goals and related metrics of enabling processes.

It is clear that these goals and metrics are financial and value-driven, and thus can be directly addressed by LNA's TBM initiative.

6. Conclusion

LNA is posed with a requirement for IT costs transparency and an adequately implemented TBM seems to address the business needs. With TBM being a complementary governance initiative, it is clear that TBM's primary goal—demonstrating IT value to stakeholders and optimizing cost vs. risk, maps into COBIT principles and processes. Therefore, the implementation of TBM not only addresses the immediate and tangible objective of cost transparency, but also supports future smart technology investments by aligning with major tenets of the holistic COBIT governance framework.

7. Discussion Questions

- 1) While the TBM implementation at LNA is discussed at length through the lens of COBIT 5, are there ITIL governance framework components that the TBM model will either leverage or enhance?
- 2) Assuming that LNA has not yet implemented a COBIT governance initiative, is a COBIT initiatives perhaps a pre-requisite before the IT organization “latches on” to this new financially-driven framework for defining IT value? Does the TBM initiative seem to address a significant portion of the framework and its principles?

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