Enterprise Architecture: Moving Organization X towards Their Strategic Objectives

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Executive Summary .................................................................................................................. 3
General Background ................................................................................................................ 4
Introduction of Major Architectural Issues ........................................................................... 6
Analysis of Major Architectural Issues
Issue #1: Cultural Divisions and Lack of Communication between Departments Business Case .... 6
  Base Architecture .................................................................................................................. 7
  Target Architecture ............................................................................................................... 7
  Gap Analysis ......................................................................................................................... 8
Issue #2: Siloed Data ............................................................................................................... 9
  Business Case ....................................................................................................................... 9
  Base Architecture ................................................................................................................ 9
  Target Architecture ............................................................................................................. 10
  Gap Analysis ....................................................................................................................... 10
Issue #3: Lack of Controls and Governance ......................................................................... 11
  Business Case ..................................................................................................................... 11
  Base Architecture ............................................................................................................... 11
  Target Architecture ............................................................................................................ 12
  Gap Analysis ....................................................................................................................... 12
Issue #4: Lack of Metrics ..................................................................................................... 13
  Business Case ..................................................................................................................... 13
  Base Architecture ............................................................................................................... 13
  Target Architecture ............................................................................................................ 14
  Gap Analysis ....................................................................................................................... 14
Issue #5: Use of Extensive Systems ..................................................................................... 15
  Business Case ..................................................................................................................... 15
  Base Architecture ............................................................................................................... 15
  Target Architecture ............................................................................................................ 16
  Gap Analysis ....................................................................................................................... 16

Recommended Solutions for Major Architectural Issues ...................................................... 16
Issue #1: Cultural Divisions and Lack of Communication between Departments ................. 16
  Recommended Solution ....................................................................................................... 16
  Alternatives ......................................................................................................................... 17
Issue #2: Siloed Data and Systems ....................................................................................... 17
  Recommended Solution ....................................................................................................... 17
  Alternatives ......................................................................................................................... 18
Issue #3: Lack of Controls and Governance ....................................................................... 18
  Recommended Solution ....................................................................................................... 18
  Alternatives ......................................................................................................................... 19
Issue #4: Lack of Metrics ..................................................................................................... 20

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Executive Summary

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In an article titled “Business Architectures in the Public Sector: Experiences from Practice,” several authors discuss the common phenomenon currently being faced by many government organizations. They write, “A critical assessment of the internal processes in many government agencies reveals a substantial level of redundancy and rigidity, as well as a lack of modularity. Moreover, processes are usually organized in (often product-oriented) stovepipe systems. As a result, governments are unable to meet customer needs, coordinate their processes in a coherent manner or offer the transparency modern customers demand. There is a need to redesign and modularize government processes. Due to the failing connection between the new customer-oriented business processes, which require specific information to be available at the right moment, and the existing rigid product-oriented processes and information architectures, agencies find it next to impossible to implement services for citizens” (Bouwman et al., 2011, 412).

The organization discussed in this paper is facing this exact challenge in their current operations. This paper presents several directly related issues recently identified during a business process analysis project in a local government organization. The effort entailed documenting the as-is state of the organization and identifying major pain points within the agency. The problems that were detected are preventing the organization from being an efficient, strategic, customer-facing agency, which are the main focus of their long-term goals and vision. Among other things, this study brought to light issues such as the cultural divide between departments, the housing of data in departmental siloes, the lack of internal controls and governance, the lack of metrics, and the use of far too many systems.

While each problem discussed can be solved individually, it is recommended that the agency take on an enterprise architecture initiative to address all of these issues and to prevent further foreseeable roadblocks. All solutions provided in this paper are built around the TOGAF framework, which is a highly used and accepted methodology for implementing enterprise architecture in any organization. TOGAF is centered around an Architectural Development Method (ADM) that is broken out into phases, moving an organization more seamlessly through the development and implementation of an enterprise architecture program.

Solutions for each individual issue are identified below, but at a high level, the main recommendation for the organization is to band together as a cohesive unit to take advantage of departmental synergies in order to simplify processes and share information. This will empower the organization, hold all members accountable, and provide an efficient, customer-centric experience for all involved.

**General Background**

This organization is a local government organization whose main business is handling public records in several different domains. The office is divided into five main divisions plus a management team, a
finance team, and a human resources team. A depiction of the organization is presented in the Appendix (Value Chain Diagram). It is led by an elected official who is either re-elected or rotated out every 4 years. This organization serves only the residents of a particular county in Colorado.

This agency is extremely public and customer-facing, hence their vision and mission statements are centered around being regarded as very customer-centric and as a trusted team, in addition to providing customer-friendly processes that are efficient and transparent. Like many government agencies, the residents of this county must rely on this organization to perform several different services, and thus the agency is focused on striving to make each interaction as painless and easy as possible in order to drive customer satisfaction up while becoming a more efficient and successful organization.

The organization has experienced many periods of turmoil, due to many factors including newly elected leadership, external political and economic circumstances, employee turnover, and others. This has led to the establishment and implementation of processes and systems that were convenient at the time. Each division has dealt with the ups and downs in a siloed manner, adjusting within their own internal departments to deal with the situations they were facing. As a result, there are a multitude of systems being used and there is a lack of communication within the Office as a whole. Many of the divisions are duplicating one another’s efforts because they continue to operate in the same way that things have always been done. Each division is also mandated by a set of government statutes that they must abide by, causing some unfixable inefficiencies and architectural issues; however, there are other matters that could be vastly improved using the principles of Enterprise Architecture and the framework that TOGAF provides. The office is currently undergoing a major business process analysis and re-engineering effort in order to alter their operations and systems, allowing them to become more efficient, more customer-centric, and more strategic in the long term. This undertaking has led them to explore the possibility of an Enterprise Architecture venture to aid them in being regarded as one of the top agencies in the state, and even in the nation.

The book Enterprise Architecture as Strategy showcases the Washington, D.C. government as an example of a successful enterprise architecture implementation; this discussion parallels many of the issues being faced by this organization today. The Chief Technology Officer of Washington D.C. states, “‘As a District, the finest thing I can do for you, the residents, is to give you benign service delivery. I can make it easy for you to deal with me. I can make it not horrible’” (Ross, Weill, and Robertson, 2006, 17). This statement encompasses the agency’s high-level goal, and they will be much closer to reaching it after addressing the issues presented below to move to a higher level of enterprise architecture maturity.

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Introduction of Major Architectural Issues

Issue #1: Cultural Divisions and Lack of Communication between Departments
Due to the fact that each division deals with a different set of records and processes and that they have accommodated for business environmental changes separately over the years, there is little communication between the departments and little cohesion amongst the organization as a whole.

Issue #2: Siloed Data
Each division operates in a silo, using separate systems to store customer data even though the entire enterprise is dealing with the same customer base; essentially, each division is collecting and storing the same Master Data.

Issue #3: Lack of Controls and Governance
The organization has a lack of internal controls, leading to customers being overlooked, certain employees not doing their work, and important tasks that do not get done; this is inherently a big risk management issue for the organization.

Issue #4: Lack of Metrics
At the current moment, the organization does not have any tracking in place to measure metrics such as employee productivity, throughput time, customer satisfaction, etc., thus hindering their ability to improve without knowing where the problem areas are.

Issue #5: Use of Extensive Applications and Systems
Each division is using their own set of systems, most of which do not integrate with any systems within other departments. In addition, some of the divisions’ processes involve several applications that all perform the same functions.

Analysis of Major Architectural Issues

Issue #1: Cultural Divisions and Lack of Communication between Departments

Business Case
Enterprise architecture brings with it many benefits that include agility, heightened customer satisfaction, lower IT costs, higher IT responsiveness, and strategic business outcomes, among others (Ross, Weill, and Robertson, 2006, 93). However, this relies on an enterprise that works together as a single entity, capitalizing on the synergies between departments within the organization. Enterprise architecture is the bridge between the IT side of the organization and the business goals and strategic vision developed by management. The front line workers in the organization carry out these goals via their every day work and interactions with customers. It is not enough to simply align the long-term strategic objectives with the IT operations; everyone in the organization must also be unified behind a single EA effort and strategic vision and they must be willing to work together to achieve them. This is
extremely hard to do when there is currently a cultural attitude within the organization that each division operates completely independently from the others. Without any communication between departments, all possibilities of enterprise-wide synergy are lost. Each department will continue operating in their own way, and the enterprise will not be able to take advantage of these enterprise architecture benefits by working together and sharing processes and information to more easily achieve success and move towards reaching their outlined objectives.

**Base Architecture**

Each department currently operates using its own set of processes, most without even knowing what the other divisions do. There is little communication or interaction between divisions on a day-to-day basis. When enterprise-wide changes are made, they are implemented one department at a time via the department manager. There is no sense of wholeness within the organization; speaking with employees at various levels of the organization has confirmed this. Employees identify with their own division and there is a sense of protection and ownership within each department. Most employees do not view the organization as a cohesive unit, some of which can be attributed to the fact that there is no sense of long standing culture or connectedness amongst the different departments since the leadership changes every so often.

Many of the employees in this organization feel a sense of entitlement due to the fact that they have been at the agency for many years and they know the ins and outs of their work and their department. They do not feel that they need to put any effort towards interacting with outside divisions or towards becoming a cohesive unit. Most employees are not even aware that there are strategic objectives in place, much less what these actually entail; they go to work to do their day-to-day jobs, but they do not see the bigger picture of the organization as a whole or of the long-term strategic implications of this attitude and method of operation.

**Target Architecture**

Ideally, this organization would be functioning as one cohesive organization with each division still performing their individual processes. All employees would be conscious of the fact that they share the same customer base and they would be aware of the advantages of working with other divisions to ensure overall organizational customer satisfaction. Employees would be aligned behind a common set of long-term goals and the organization’s vision and mission would become part of regular conversations. The leadership and management team would be able to sell the idea of enterprise architecture as an enterprise-wide initiative, the way that it should be done.

The employees in each division should be somewhat aware of what other departments are doing and have a basic knowledge of their processes. From the point of the view of the customer, the divisions are all part of one organization; when a customer is in need of a service from this organization, they generally tend to view it as one enterprise and thus the enterprise needs to conduct themselves as so. The employees need to have an understanding of how the overall objectives affect each individual division and each individual person. Scott Johnson writes about the challenge of strategy implementation without the use of metrics:

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“Even with effective goal-setting, organizations often fail to connect higher level goals and objectives such as Comprehensive Plans, annual budgets, etc. (goals on paper) with individual department programs and activities (actions on the ground). The departments are where the work actually gets done. So, if citywide objectives aren’t translated into department objectives, they won’t happen. This is particularly important when one goal is significantly influenced by another department’s activities” (Johnson, 2010, 3).

Employees should be stretching themselves to provide better customer service and to be more efficient by leaning on other departments or other individuals to make this happen. There should be a sense of unity within the organization and an attitude that reflects that all divisions are on the same side, so to put it, and that they are all working towards one common set of end goals.

Enterprise architecture cannot be implemented within one division, but not the others. This is an organization-wide endeavor, hence the word “enterprise.” Everyone must collaborate and work together to share and integrate knowledge and simplify and standardize processes in order to become a market leader and a trusted organization.

**Gap Analysis**

What is missing in the current organization is an enterprise-wide culture. Each division has established their own culture over time, particularly since most employees have been there for many, many years. They are all very comfortable with one another and with the way things are done within their own departments, and the organization has become complacent. In his article “Why Change Culture?” Christopher Dawson discusses the effect that a misaligned culture can have on organizational strategy. He writes, “If your strategy isn’t working, your culture (the way we do things) may be the reason. [...] The best strategy is useless with misaligned culture” (Dawson, 2012).

Since the leadership team is elected, it is changing every few years and the organization lacks a deep-seated culture that is present enterprise-wide; if this were present, the leadership would only add to the culture, not throw it for a loop every time members are changed out. Each new elected official that comes in is assaulted by an extremely high learning curve, and they unfortunately spend much of their time attempting to learn the ropes and not enough time on the things that will impact the organization in the long-term; Dawson writes, “Culture is a reflection of top leaders’ personal values and behaviors” (Dawson, 2012).

This obviously takes an extremely long time to build, but the effort must start with the leadership team. These people must walk the talk, and infuse the organizational culture with values and actions that are consistent with the strategy. Management must begin emphasizing the value of working together as a cohesive organization and the synergies that can be developed between teams in a way that resonates with individuals’ daily work. Culture is built in the workplace, but it is also built by forming relationships in social situations; the leadership team will have to work to create opportunities for these relationships to begin and for employees to meet people in other departments and become familiar with all of the faces in the organization so as to utilize all available talent and knowledge.

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Issue #2: Siloed Data

Business Case
As mentioned in the business case for Issue #1, enterprise architecture allows organizations to capitalize on potential synergies by aligning the entire enterprise to a single set of business goals and using a single set of IT assets to support that vision. One of the most important assets in an organization is the information that is captured by various systems and also by each employee throughout their time at the organization. In the case of this organization, all divisions are providing services to a single set of customers. Each division collects the same set of Master Data about the customer using their own systems; this information is then stored separately within each division and it is not shared enterprise-wide. Many customers require services from more than one division, and they must provide the same information each time. This is frustrating for the customer, and requires more time on the part of the employees. In turn, there is more room for data entry error, causing delays in throughput time.

If the data were to be collected by the first division visited by the customer and shared enterprise-wide in a central database, each division would be dealing with a single set of data, providing much better customer service as well as increasing efficiency and lowering error rates.

In regards to the organization’s enterprise architecture initiative, a coordination operating model is the most appropriate. This model is for organizations where departments share customers but they each have unique operations that demand unique processes and capabilities. The benefits of integrating data between business units in this type of model include integrate customer service, cross-selling, and transparency across processes (Ross, Weill, and Robertson, 2006, 33). A coordination operating model core diagram for this organization is presented in the Appendix (Core Diagram). In addition, a diagram depicting the systems in use as well as who is using them is also shown in the Appendix (Role/System Matrix); this shows how the data is siloed by division, and while management has access to all systems, there is no central place to access Master Data.

Base Architecture
Each division operates using a different set of processes and systems that do not interact with each other. When a customer requests a service, Master Data is taken about them and manually entered into that department’s respective database as the first step to providing the service. This information is stored only within that division, so when the customer requires a service from a different division, their information must be re-entered to be stored within that department’s records. There is a large margin for error, and employees within individual departments spend a large amount of time entering data that is already stored elsewhere in the enterprise systems.

This exact situation is described in a business scenario advocating the use of a Master Data Management system:

“IT systems, labor and money are limited resources for an enterprise; smart of use of them is equivalent to maximum returns on investment. [...] This depends on high-quality customer master data delivered
by an MDM system. If master data is unmanaged and a customer changes an address, this often requires keying in this information multiple times across various systems. Using an MDM service for this can simplify this situation significantly” (Godinez et al., 2010, 313).

In addition, there are auditing steps at multiple points in the process to catch errors that may not have been made had the information already been in the system. This causes delays in throughput time, decreases in efficiency, decreases in customer satisfaction levels, and it wastes resources and time.

**Target Architecture**

The organization’s main data domain is Master Data, which is described in the book The Art of Enterprise Information Architecture as data that:

“Represents the essential business entities such as customers, products, suppliers, accounts, and locations to name a few. This core enterprise data is used in many different business processes and many dependent data entities such as opportunities, orders and bills. Thus, they are considered master objects serving the purpose of being the information foundation for many operational processes” (Godinez et al., 2010, 57).

As part of their EA venture, the enterprise should implement a centrally managed Master Data Management system that would house customer data collected from all divisions. Each time a customer made contact with a particular division, information would be updated as necessary, but not completely re-entered. All divisions would have access to this MDM system and would be able to see customer interactions throughout the organization, rather than simply within their own division.

Each division will continue to operate using their own systems, since they each deal with a different arena of requests and operate using a different set of processes. The Master Data Management system would simply be coupled with each divisional application in order to provide information as needed; any Master Data entered into these applications would be uploaded in real-time and available to other divisions. This would include address changes, phone number and email updates, and other similar information. Information that is specific to each division and that would not be useful to other departments should continue to be stored within the divisional systems.

**Gap Analysis**

The gap in this case consists of the lack of a Master Data Management system. There are currently no systems in place to house customer data from all divisions in one central place, easily accessible to all those who need it. In order to reach the target architecture, the organization needs to evaluate options on the market that can provide this solution.

The organization will have to educate all employees using the current systems on the new MDM system and processes will have be redesigned as needed to accommodate this system. There may be a learning curve or a user acceptance period during which the organization will need to continue the education and training necessary to put this system into place.
Issue #3: Lack of Controls and Governance

Business Case
An enterprise architecture initiative requires governance mechanisms surrounding all projects that are undertaken during the EA initiative as well as projects and processes that are added into the portfolio at a later time. The TOGAF® Foundation Study Guide defines governance as “ensuring that business is conducted properly. It is less about overt control and strict adherence to rules, and more about effective usage of resources to ensure sustainability of an organization’s strategic objectives” (Harrison, 2011, 115). There must be rules governing how the enterprise does business that align with the long-term strategy and the IT systems that support it. One of the organization’s main goals, as mentioned in the Background section, is to be regarded as a highly customer-centric organization. In order to do this, the organization must ensure that no customers slip through the cracks and that each request is fulfilled in a complete and timely manner.

Each employee must be pulling their share of their weight and contributing significant value to the organization in order to maximize the use of organizational resources and assets. Each member of the organization must be working towards fulfilling the enterprise goals by providing superior customer service and following the established rules and procedures governing the enterprise architecture and the organization as a whole. Without these internal control mechanisms in place, there is no management over how much work employees are doing, how well they are doing, whether customers are falling through the cracks, etc. They ensure that management enterprise-wide has a handle on how accurately requests are being fulfilled and by whom, while maximizing the management team’s time as well, allowing them to focus on organizational strategic objectives rather than always being down in the weeds of the process. The current structure can be seen in the Appendix (Business Use-Case Diagram).

Base Architecture
Most of the divisions are currently operating with no form of internal controls. One example of this issue is seen in the fact that a very large percentage of requests come in via email, and individual employees then move these requests into their individual email boxes to work on them. Once the emails are moved, there is no trail of when the email was received, when it was moved to an individual’s workflow, and whether or not the request was fulfilled. There is a risk that some of these requests may be forgotten about or that the work associated with them may not be completed, and department line managers have no way of tracking this until a customer realizes their request has not been completed and voices their discord to the organization. Once at this point, management does even know which employee had originally taken on the request.

On top of this risk, some employees are dealing with requests at a much faster rate than others; during conversations with several members of the organization, it became clear that some of them may be completing up to five times as much work as others. Without having the information as to whom is completing what work, management cannot make important organizational decisions regarding resource loading and organizational structure.
**Target Architecture**

The target architecture for this issue would be an organization with internal controls, as well as checks and balances. Managers should have a way of tracking each employee’s workloads and error rates; there should also be a process in place for managers to alert employees of their mistakes and have them fix their own errors. Employees should be held accountable for the correctness and completeness of their work, as well as the workload they are expected to carry.

The controls in place should be adequate enough so that managers can place trust in their employees to do their work, but also to know that should there be errors, a system is in place to catch them. This will allow managers to be focused on moving the organization towards its long-term vision and on creating strategies to become more customer-centric, rather than on policing employees’ daily work. The book *Enterprise Architecture as Strategy* discusses this when the authors write,

“To focus management attention on higher-order processes, such as serving customers, responding to new business opportunities, and developing new products, managers need to limit the time they spend on what should be routine activities. They need to automate routine tasks so those tasks are performed reliably and predictably without requiring any thought” (Ross, Weill, and Robertson, 2006, 3).

Employees should be aware of these controls and the consequences that come with this new structure; this will in turn motivate them to pay more attention to reducing the number of errors and to handling higher workloads since there are now monitoring mechanisms in place. This should be communicated in terms of an enterprise architecture initiative, relaying the idea that having a governance structure in place in all aspects of the organization will streamline the enterprise architecture process, allowing the agency to more easily reach their goals and securing a stable foundation for execution for future projects and ideas.

**Gap Analysis**

The current as-is architecture does not have any internal controls or governance structure in place. All work is done based on good faith and on management auditing every activity. This is extremely time-consuming and inefficient. The to-be governance structure should have internal controls built in to ensure that employees are carrying their own weight and to allow management to free up their time to focus on bigger issues that the enterprise is facing, in particular the implementation of an entire enterprise architecture.

There is often a lot of push back when changes like this are implemented. Many employees in this organization have been there for an extremely long time and are used to the way things are; several have a know-it-all attitude and feel that the organization owes them something for their many years of work. There will be resistance to the implementation of overarching controls; the key is how these changes are communicated. Management must present these new controls as being a helpful tool, allowing the organization to move towards their goals and to make sure that some employees are not doing more than their share of work to make the workload equitable throughout the organization.

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These controls will also improve customer service by making sure that all customers are taken care of and that no one slips through the cracks.

**Issue #4: Lack of Metrics**

**Business Case**

In a problem somewhat related to Issue #3, the organization currently has no metrics in place. Metrics become very important in the case of enterprise architecture as they allow management to understand how the organization is functioning and where the pain points are within the process. Once a solid enterprise architecture is in place, the organization can tailor solutions to these pain points and bottlenecks that fit within their architecture vision; however, with no solid data to back these assumptions up, it will be difficult to zero in on a focus.

Being that this organization is focused on customer service and providing efficient processes, metrics are essential to tracking success levels. Having a set of easily identifiable and quantifiable metrics allows management to make strategic decisions, set long-term goals and benchmarks, become more aware of resource loading issues, and address areas of the process that may be holding the organization back.

Scott Johnson discusses a project done at the City and County of Denver to implement a Balanced Scorecard in the Development Services department in his white paper called “Redeveloping’ Denver’s Development Services Function with Purpose and Value—An Application of the Triple Bottom Line Balanced Scorecard.” His work is applicable to the problems being faced by this organization, which is apparent when he writes,

“Organizations in the public sector, however, are not about “making” money, but rather are about using money more effectively to create value for citizens through delivery of services and improving quality of life. The scorecard can be thought of as the “map” that connects the dots between day to day work activities that leverage unique internal resources and capabilities to create unique value propositions for customers and/or constituents” (Johnson, 2010, 4).

This Balanced Scorecard approach is applicable to enterprise architecture because it gives the organization a way to monitor enterprise maturity and enterprise progress throughout the implementation and into the future as the organization works its way towards achieving its strategic goals with the use of their resources and IT foundation.

**Base Architecture**

The organization does not currently have any metrics in place. They do not track any measures aside from financials, and thus have no idea how they are really performing other than from limited customer feedback. The organization cannot connect day-to-day work with overall strategic objectives, and employees do not currently have an understanding of how their work affects these goals. This agency has identified being a leader in their field as a top priority, but they do not have a way to achieve this goal without accurate measurements as to where they currently sit.
There may also be areas where the process works extremely well and there are extraneous technologies or perhaps even personnel that can be directed elsewhere in order to increase efficiencies. On top of this, should the agency identify a pain point and need to request funding or additional personnel to address it, it may be difficult to back this request up without solid, quantifiable evidence that is available from using a set of metrics.

**Target Architecture**

The organization should put a Balanced Scorecard in place to track metrics for all divisions. Each division should have a set of metrics that reflect their everyday work and can be used to measure their success. These metrics, also sometimes known as Key Performance Indicators (KPIs), can provide significant value to an organization.

“By implementing the definition, monitoring analysis, and tracking of KPIs, BPM (Business Performance Management) provides business users and decision makers with the insights required for implementing actions aimed to optimize business performance. This mechanism turns BPM into a powerful enabler of the close link that must exist between IT and business communities, which we consider one of the core EIA principles” (Godinez et al., 2010, 287).

The metrics gathered using the Balanced Scorecard can be used to make informed, strategic decisions, particularly concerning enterprise architecture-related projects that may present themselves in the future.

**Gap Analysis**

The organization currently does not measure any metrics; their customer satisfaction is monitored solely through customer comments or feedback that is pushed to them. The organization has identified several strategic themes that they would like to focus on; these include being a customer-centric organization, providing efficient processes, and being regarded as one of the best local government agencies in the state of Colorado. The problem is that they have no way to measure their progress towards these goals.

The organization needs to brainstorm what is important to measure in their day-to-day processes. Even if these metrics may be somewhat difficult to pin a qualitative number on, it’s essential that these are tracked and monitored in some way. All metrics must be tied to one of the strategic objectives; employees must understand how these measurements are driven by their everyday work and why they are important in achieving the long-term vision.

The process of implementing these metrics is tied to Issue #3 as well, because a Balanced Scorecard automatically adds a level of internal controls to the organizational structure. Tracking different metrics will give the management team an insight into how well the organization is performing and what or whom is driving that success.
Issue #5: Use of Extensive Systems

Business Case
Enterprise architecture is partly based upon the idea that the organization should deal with one set of systems that encompass all processes and support the goals of the organization. Information should be shared and distributed throughout, as appropriate. It should be readily available, complete, accurate and timely. The applications and systems that supply this information should be simple but useful, each IT asset adding value and unique capabilities to the enterprise. The systems in place should be loosely coupled and should allow the flow of information throughout the organization as needed. Holding onto multiple IT assets that are not all useful leads to higher IT costs, both in maintenance and in employee training, as well as to work inefficiencies, more separation of data and a higher risk of error. Having a more streamlined set of technologies to support daily processes and long-term strategic vision enables organizations to be much more agile, to easily add on applications as needed, to decrease IT costs, and to increase efficiencies as well as overall customer satisfaction (Ross, Weill, and Robertson, 2006).

Base Architecture
At the current time, each division is operating using their own set of systems to perform their processes. These systems do not connect with any other division’s systems, hence the problem in Issue #2 of siloed data. Employees of one department are unfamiliar with the systems and applications in any other area of the enterprise, and are therefore confined to working within their assigned division; this is partially due to the problem discussed in Issue #1 of a divisional, separated culture.

There remains a still bigger problem to address, which is that multiple systems are being used within each division as well. Many of the divisions are functioning using several applications that essentially perform the same operations. Department employees are trained on all systems as requests may come in using any of them, and they are expected to perform the work accordingly. Customers that are making requests are often confused about which portal to send their request through and employees spend a large amount of time dealing with these questions. Some of the systems require much more manual work than others, while still others require additional back-up systems to function properly. Each division seems to have a preference on which systems are the easiest, most accurate and most efficient to use, but the organization has made no effort to consolidate their systems and direct customers to use one rather than giving them a choice of up to four different avenues.

Related to Issue #2 of siloed data, the information from requests that come in through the different systems is stored in the various systems, and is thus sometimes not even shared with the whole department, let alone the entire organization. The applications and various users of each system can be seen in the Appendix (Application and User Location Diagram). This creates frustration on the part of the customer when they have to follow up on a request and the employee cannot immediately find their information, but instead they must shuffle through the multiple systems.
Target Architecture
Each division should evaluate all of their systems that are currently being used. Many of the divisions are utilizing multiple applications that perform the same functions; this is completely unnecessary. By evaluating the systems that are currently in place and their functionalities, as well as their pros and cons, each division shall make some decisions as to which applications are the most beneficial and get rid of the others.

Each division shall educate their clients on the chosen systems, particularly those who do not currently use them. They will put some mechanisms in place to ensure that all customers are using the preferred systems rather than the legacy systems. The divisional applications shall all link to the Master Data Management system in order to share Master Data amongst the departments.

Gap Analysis
In this case, it is not what is missing from the organization but rather what can be eliminated. Part of implementing an enterprise architecture initiative involves simplifying the set of underlying technologies in order to establish a strong foundation upon which other projects and applications can be built. This organization is currently using far too many systems that comprise a rather complicated IT structure; the goal is to minimize this number.

The organization must conduct an analysis of all systems currently in possession and determine which are the ones that are essential to their operations. They must analyze how these systems interact with other in order to take advantage of any synergies that may exist.

Recommended Solutions for Major Architectural Issues

Issue #1: Cultural Divisions and Lack of Communication between Departments

Recommended Solution
In an organization such as this one that has been around for many years and has operated in a siloed manner since its beginning, it is extremely hard to evolve to a cohesive organization. This will be a slow transition for the agency, and most probably one that will receive a lot of resistance. Many of the employees have been working at the organization for decades and are used to the way things are; in addition, they have become complacent and many are unwilling to do more than the bare minimum that is required. Attempting to motivate all divisions will require a great deal of time and effort, but it is a necessary step in order for an EA initiative to thrive in this organization. All managers and employees must be aligned behind one common set of organizational goals and one long-term vision of success. In an article called “Federal Enterprise Architects: Selling EA Requires Stealth,” Wade-Hahn Chan suggests selling the culture changes and the enterprise architecture initiative from a business perspective in a relatable way (Chan, 2006).
The key to this solution is baby steps. The leadership and management teams must bring organizational culture into all aspects of the agency slowly. Conversations must be started about the organizational culture and how the culture is connected to the strategic objectives. Managers should begin exploring quick wins that demonstrate the benefits of a holistic organization in order to prove their points. The leadership team should identify synergies that may exist within the personnel realm, for example, are there certain employees who are cross-trained or know the processes of more than one division? This may be one option to look into that could also address any issues of resource loading if one division experiences a large increase in work load while others do not. Once the idea of an enterprise-wide, strategic organizational culture is introduced and presented to employees, it should be re-introduced and over-communicated throughout the enterprise architecture implementation. Without a strong culture supporting the long-term goals and values of the organization, an enterprise architecture project will surely fail.

Alternatives
Building a new culture within a group of seasoned employees can prove to be extremely difficult, and there is no guarantee of success. One alternative to this is to bring on a new group of employees and build the holistic organizational culture within this new group from the beginning. While it may be easier to cultivate this type of environment with people who have not spend years working in such a divided culture, there are other setbacks to consider.

First of all, hiring new employees is extremely costly. The costs include recruitment, hiring and training costs, among others. Being that this is a government organization with a limited budget, this may not be the best way to spend money. In addition, these employees will not be familiar with the history of the organization and the way that it operates.

Most of the employees in the organization have a sense of dedication to the agency and it is easier to motivate people who feel as though they are part of something bigger. By cultivating this culture from within, the organization will push employees to embrace this change since they will feel a sense of ownership for the organizational culture. The costs and learning curve of going this route far outweigh the efforts of creating a new culture within an already thriving workforce.

Issue #2: Siloed Data and Systems

Recommended Solution
The recommended solution for this issue is to put a Master Data Management system in place to address the fact that there is a duplication of effort where each division is collecting the same basic data about the same set of customers. A Master Data Management (MDM) system will centralize data so that it is easily accessible to anyone who needs it, as well as give employees a more complete and up-to-date picture of a particular customer. Personalizing interactions with customers brings the organization one step closer to their vision of being regarded as one of the most customer-centric organizations in their field. In addition, centralizing data will also address pieces of Issue #1 because it further removes the

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perception that each division operates in a silo, and highlights the fact that the organization is one enterprise providing slightly different services.

When a customer requests a service from a particular division, the employee fulfilling the request will be in charge of updating customer information so that it is immediately available in the MDM system for other employees to see should they deal with that same customer in the future. Having all data entered once and then simply updated without having to start from scratch each time greatly minimizes the risk of data entry errors and also minimizes the level of effort and frustration on the part of the customer. Most people dread interactions with government agencies because they have the reputation of providing horrible customer service and many run-arounds; this organization can mitigate the perception by using previously gathered customer information to make the process much more simple and efficient.

In addition to implementing an MDM system, the organization should consider using a Multi-Tier High Availability for Critical Data operational pattern to manage their system. One of the key features of this pattern that make it well suited to this particular agency’s needs is that it enables the overall system to service a higher application load, meaning that all divisions will be capable of accessing the Master Data at the same time. Another key feature of this pattern is high availability disaster recovery, making the Master Data available even during a potential disaster; this is essential to minimizing the daily business operations of the organization since they run almost solely on Master Data (Godinez et al., 2010, 181-183).

**Alternatives**

The organization could consider continuing to house customer data based on which division the request came through. A mechanism could perhaps be architected so that if a customer spoke with two departments, the information could be shared between these particular divisions. However, this actually adds a layer of complexity to the technology and leaves room for error and risk that certain customers may be left unattended and may fall through the cracks. This goes against the principles of enterprise architecture that deal with shared access of real-time, accurate, complete information as needed. Having to request this data from other departments will actually cause the organization to become less efficient and will potentially lower their customer satisfaction levels.

Should the organization decide to go this route, there will be no centralized place for information to be stored, hindering management’s ability to analyze customer data or to access uniform information in one spot. In addition, managing Master Data using the operational pattern as suggested is no longer feasible.

**Issue #3: Lack of Controls and Governance**

**Recommended Solution**

In order to counter this problem, the organization should establish a governance structure that has internal controls built in. These controls should include such mechanisms as minimal audits at periodic

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points in the process, as well as random checks by managers. In addition, managers must have a way to monitor each person’s workflow and measure how much work they are completing daily, as well as the error rates. When no one is held accountable and managers cannot tell who is making errors or not pulling their weight, employees are not motivated to work hard and they do the bare minimum in order to keep their jobs.

The governance structure should also be in line with the planned enterprise architecture venture. In addition to holding employees accountable, it should link IT resources and information to organizational strategies, it should enable the organization to take full advantage of all resources available to them (including personnel), and it should incorporate industry best practices related to auditing, information security, and responsibility (Harrison, 2011, 117).

Enterprise architecture is about standardizing and simplifying core day-to-day processes in order to spend more time looking to the future and developing creative solutions to become market leaders. This is not feasible when managers and the leadership team spend most of their days policing data entry and workloads. With internal controls in place, they can place more trust in their employees and they are free to work on strategic initiatives.

As mentioned above, there are some internal controls that should be built around accountability. Software systems that are chosen should incorporate workflows and work delegation, employees’ names associated with each completed action, error rate reporting, and other features that automate the managers’ current policing work. In addition, these reports and measurements should be incorporated into performance reviews to assess whether certain employees should be kept on the team. Employees should be held responsible for fixing their own mistakes and managers should review these mistakes with them on a regular basis; this will encourage learning from errors rather than dismissing them.

With these controls in place, the leadership team will be able to concentrate on moving the enterprise closer to their strategic goals of delivering efficient processes and being a superior customer-facing government agency while furthering their enterprise architecture initiative. Having internal controls in place is best practice for any enterprise to ensure that everyone is pulling their weight and customers and certain tasks are not being overlooked or done poorly. It also provides a framework with rules and regulations to follow in implementing new systems or new projects within the organization.

**Alternatives**

The alternative to infusing internal controls throughout the organization is to allow managers to manually implement controls by regulating all work that goes through the office. If however, managers are controlling all activities, there are no checks and balances in place to ensure that everything is being done correctly. In addition, managers are tied up with monitoring activities all day long rather than focusing on management activities such as analysis, success measures, strategic objectives, and driving the organization towards being a leader. There will be no time to focus on driving the agency towards a
more mature stage of enterprise architecture because all members will be so focused on the simple day-
to-day activities.

**Issue #4: Lack of Metrics**

**Recommended Solution**
This agency should implement a Balanced Scorecard to measure metrics across the organization; these metrics should deal with everything from process to people to technology. The Balanced Scorecard methodology hinges everything on top of the overall organizational strategy and long-term vision, furthering the enterprise architecture purpose of centralizing all efforts on one single version of a common vision and mission and aligning organizational structure and IT around them.

Each division will have its own set of metrics to measure its own set of processes, but there will also be metrics that measure overall organizational success; these will include such measures as customer satisfaction, employee satisfaction, and others. Each one of these metrics should be tied back to one of the identified strategic objectives. There should be supporting documentation for each metric that includes the metric author, the metric owner, the metric’s purpose, the objective that it is tied to, and how it is measured.

It is not enough to simply measure the metrics, but instead the organization must use this tracking methodology to be proactive in implementing changes or solving problems. It will allow the management team to analyze patterns and results to track their progress as an overall organization.

Measuring metrics is key to an organization’s success; without this, the only “metrics” that exist are unstructured data such as customer comment cards and internal discussions. This does not provide an accurate measure of success or paint a clear picture of how the organization is doing or where they could improve.

**Alternatives**
Each division could track their own customer satisfaction to ensure that they are staying on target. This information would come solely from customer perceptions, comment cards, etc. and provide no real quantitative indication of success or failure. This perpetuates a “why fix it if it’s not broken” mentality, which will lead the organization to a stagnant state of continuing to operate as it always has.

If each division were to establish their own set of specific, quantifiable metrics to track their measures, this would be a step up from the scenario described above. However, this is not in line with enterprise architecture principles of operating in a unified manner. Certain metrics should be tracked for each division separately since inherently their processes are all different; however, there are certain things that should be measured across the entire enterprise. All metrics, whether they are departmental or organization-wide, should be tied to an organizational objective established by the agency leadership team. As Mr. Johnson states in his white paper, “The Balanced Scorecard (BSC) provides the critical framework to measure, control, manage and incentivize all of what the organization exists to do” (Johnson, 2010, 8).
Issue #5: Use of Extensive Systems

Recommended Solution

Each division is currently using multiple systems that perform very similar functions, none of which link to each other or to any kind of Master Data Management system. This is done to appease customers who have preferences about submitting requests using one system versus the other. While the customers are satisfied with this wide variety of choices, it puts a huge strain on the organization and prevents all divisions from operating efficiently or from sharing information, even within some of the departments.

Each division needs to do an analysis of all systems that are currently in place; they need to evaluate the pros, cons of each, including functionalities, ease of use, efficiency, handoffs, number of steps, and others. As a team, each department needs to decide on one single application that can handle all of their requests. This application must be able to be coupled to the chosen Master Data Management system as well.

The beauty of being a government agency is that they are the only organization to provide the services that are needed, therefore they can direct people to use the systems of their choice, since there are no other options to obtain these particular services. If the customer base is in need of a service, they must follow the rules as they are laid out by the organization and if they don’t, their request will not be fulfilled. However, being that the organization is focused on providing an easy, efficient and pleasant experience for their customers, they may want to consider offering some customer orientation sessions, particularly to the customer base that is considered the “power users,” in order to teach them about the application and to educate customers on the benefits of this system versus the old ones. This may help ease customers into using this system.

Another way to persuade customers to use the systems chosen by the organization is to put financial ramifications in place for using other systems, at least for the short-term until these systems are taken down. This will persuade people to quickly move to using the desired system.

Once the organization feels it is an appropriate time to take the old systems down, they must ensure that all data previously stored in these applications is moved to the Master Data Management system to as to not permanently lose these records.

Alternatives

The organization could decide to continue appeasing their customers by allowing the use of several systems. There would be no learning curve for the customers or for the employees since requests will be fulfilled as usual. This would keep customer satisfaction at its current levels and would decrease the risk of unhappiness or frustration.

This solution does not encompass the ideas in enterprise architecture dealing with automating and simplifying underlying systems and would not fit within the architectural framework being developed. In
addition, the complexity of using a Master Data Management system increases because there are more than double the systems that information must be pulled from.

The agency could also go the route of simply educating customers on the preferred systems and asking them to use these; this may ease the dissatisfaction levels, however it does not help the organization in any way. Most customers will continue to use the systems they have always used with no regard to the ease of processing for the organization. As long as their requests get processed in a timely manner, the majority of customers do not have any regard to the amount of work the agency must complete. Applying financial penalties or other consequences will force customers to use these systems; there may be a period at the beginning where they will express frustration or dissatisfaction with the lack of choices, but this will subside in time when they realize that using these preferred applications will actually speed up the process and make the request fulfillment more efficient.

Roadmap
Below is a roadmap detailing high-level next steps for the organization to take. It is recommended that the organization deal with these issues in the context of an enterprise architecture program, using the TOGAF framework. The TOGAF phases are presented in this table and the solutions detailed above are tailored around the phases of the Architectural Development Method (ADM) concept used in TOGAF (Harrison, 2011). The benefits of implementing the proposed solution following the roadmap below are presented visually in the Appendix (Benefits Diagram).

<table>
<thead>
<tr>
<th>Phase</th>
<th>High-Level Steps</th>
</tr>
</thead>
</table>
| Phase 1 (TOGAF ADM Preliminary Phase and Phase A) | - Preliminary kick off meeting with all high-level stakeholders to create EA charter, scope, objectives and to obtain high-level management commitment.  
- Prepare for future TOGAF phases by reviewing organizational context, organizational structure, architectural frameworks and tools.  
- Define and establish organizational model (coordination operating model is recommended) (Issue #2 and Issue #5).  
- Determine governance structure (Issue #3).  
- Begin following recommendations to implement organization-wide culture (Issue #1).  
- Develop high-level aspirational vision of capabilities and business value to be delivered as result.  
- Obtain approval for statement of work that defines EA work program. |
| Estimated length: 4 months | |
| Phase 2 (TOGAF ADM Phase B) | - Begin developing a first draft of Balanced Scorecard metrics (Issue #4).  
- Continue emphasizing united organizational culture (Issue #1).  
- Develop baseline architecture, target architecture, and gaps between the two for the organization as a whole.  
- Describe and agree upon detailed, obtainable strategic |
<p>| Estimated length: 1 month | |</p>
<table>
<thead>
<tr>
<th>Phase 3 (TOGAF ADM Phases C and D)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated length: 2.5 months</td>
</tr>
</tbody>
</table>
|                                  | Determine all locations where information currently housed within the organization (Issue #2) as well as any relationships between applications (Issue #5).  
|                                  | Develop base and target Information Systems Architecture, describing how it will enable Business Architecture and Architecture Vision.  
|                                  | Analyze gaps between base and target architectures to develop a roadmap.  
|                                  | Determine all software and hardware in use, as well as relationships between them (Issue #5).  
|                                  | Make departmental decisions as far as which systems to eliminate (Issue #5).  
|                                  | Develop base and target Technology Architectures and analyze the gaps.  
|                                  | Integrate governance structure and internal controls into target Technology Architecture (Issue #3).  
|                                  | Continue emphasizing organizational culture (Issue #1). |

<table>
<thead>
<tr>
<th>Phase 4 (TOGAF ADM Phases E and F)</th>
</tr>
</thead>
</table>
| Estimated length: 5 months        | General overall Architecture Roadmap.  
|                                  | Group all gap analyses into work packages and build a best-fit implementation roadmap.  
|                                  | Decide on approach for each project (make vs. buy, outsource, etc.).  
|                                  | Assess priorities and dependencies between projects.  
|                                  | Tackle one project at a time.  
|                                  | Detail roadmap to address moving from base to target architecture — finalize Architecture Roadmap.  
|                                  | Perform cost/benefit analysis and risk assessment for each work package/project identified.  
|                                  | Continue emphasizing organizational culture and benefits of EA (Issue #1). |

<table>
<thead>
<tr>
<th>Phase 5 (TOGAF ADM Phases G and H)</th>
</tr>
</thead>
</table>
| Estimated length: 8 months        | Revisit governance structure and internal controls based on Architecture Roadmap (Issue #3).  
|                                  | Ensure conformance to target architecture through implementation efforts.  
|                                  | Ensure that governance framework is maintained and that employees and management are all aligned behind common vision and goals.  
|                                  | Ensure that changes are managed in a cohesive, structured way so as not to disrupt day-to-day business.  
|                                  | Implement final version of Balanced Scorecard and begin monitoring metrics to assess success (Issue #4). |
Appendix

Value Chain Diagram

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Names of organization, specific divisions, and employee names are kept confidential out of respect for NDA with the client.
## Role/System Matrix

<table>
<thead>
<tr>
<th>Application (Y-Axis) and Function (X-Axis)</th>
<th>Division 1 Employees</th>
<th>Division 2 Employees</th>
<th>Division 3 Employees</th>
<th>Division 4 Employees</th>
<th>Division 5 Employees</th>
<th>Management</th>
<th>Finance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Division 1 Applications</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Division 2 Applications</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Division 3 Applications</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Division 4 Applications</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Division 5 Applications</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Finance Application</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

## Business Use-Case Diagram

![Business Use-Case Diagram]

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### Application and User Location Diagram

<table>
<thead>
<tr>
<th>Application</th>
<th>User Type</th>
<th>Internal, Customer or Partner</th>
<th>User Business Location</th>
<th>Location Address</th>
<th>Org Unit (User Belongs to)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Division 1 Applications</td>
<td>Employee Manager</td>
<td>Internal</td>
<td>Organization Office</td>
<td>Denver, CO</td>
<td>Division 1</td>
</tr>
<tr>
<td>Division 2 Applications</td>
<td>Employee Manager</td>
<td>Internal</td>
<td>Organization Office</td>
<td>Denver, CO</td>
<td>Division 2</td>
</tr>
<tr>
<td>Division 3 Applications</td>
<td>Employee Manager</td>
<td>Internal</td>
<td>Organization Office</td>
<td>Denver, CO</td>
<td>Division 3</td>
</tr>
<tr>
<td>Division 4 Applications</td>
<td>Employee Manager</td>
<td>Internal</td>
<td>Organization Office</td>
<td>Denver, CO</td>
<td>Division 4</td>
</tr>
<tr>
<td>Division 5 Applications</td>
<td>Employee Manager</td>
<td>Internal</td>
<td>Organization Office</td>
<td>Denver, CO</td>
<td>Division 5</td>
</tr>
<tr>
<td>Financial Application</td>
<td>Employee Manager</td>
<td>Internal</td>
<td>Organization Office</td>
<td>Denver, CO</td>
<td>Finance</td>
</tr>
<tr>
<td>Web Request Portal</td>
<td>Employee Manager Administrator</td>
<td>Internal Customer</td>
<td>Organization Office Web</td>
<td>Denver, CO</td>
<td>Information Technology</td>
</tr>
<tr>
<td>Web Document Search</td>
<td>Employee Manager Administrator</td>
<td>Internal Customer</td>
<td>Organization Office Web</td>
<td>Denver, CO</td>
<td>Information Technology</td>
</tr>
</tbody>
</table>

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Benefits Diagram

References


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Sarah Nasser is a business analyst for reVision, Inc., a Denver-based IT company that provides consulting, technology integration and engineering services to a broad customer base, including local, state, federal and commercial clients nationwide. She has been working in this capacity for just over two years and has provided support to key clients in several subject matter areas including Enterprise Architecture, Performance Management and Balanced Scorecard, Governance, Business Process Reengineering and Communications Support. Sarah received a Bachelor of Science in Business Administration from the Leeds School of Business at the University of Colorado at Boulder in 2010. She is currently working towards her Masters of Science in Business Management from the Daniels College of Business at the University of Denver and expects to graduate in September of this year.