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Business Architecture for Banking
as Described by Four Scenarios

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Abstract—Despite the existence of numerous Business Architecture frameworks developed by standard bodies and related practices emerging in Financial Services organizations, broad adoption of Business Architecture modeling has not yet occurred. This paper presents scenarios that make business architecture valuable for the Banking Industry.

Specifically, we focus on one of the main hurdles for Business Architecture adoption, i.e., the present lack of understanding of the value for companies in developing a Business Architecture model. We present a series of useful scenarios illustrating how Banking organizations could definitely benefit from Business Architecture models to address some of their most challenging priorities. In fact we argue that some of the most prevalent industry challenges will be difficult to meet without a Business Architecture model.

We believe that it is necessary to provide detailed business insight when presenting business value scenarios for Business Architecture to mature. Standard bodies such as OMG or TOG have made an important initial contribution focused on their Information Technology-centric communities but more business depth is needed for Financial Services organizations such as banks to fully adopt Business Architecture models and related practices beyond the IT function.

Keywords-Capability, Business Rules, Process, Measure, Metric, Scenarios, Business Architecture

I. INTRODUCTION

While there is no unanimity on the detailed definition of Business Architecture, there is a general consensus on its fundamental purpose and constituent elements. A Business Architecture is intended to define a formal corporate business model [1], provide the semantic framework for speaking about common business concerns [1], and structure responsibility over economic activities [2]. A Business Architecture contains business strategy, governance, organization, and key business processes information, as well as the interaction between these concepts [3]. However we contend that at a more tangible level there is insufficient clarity on how Business Architecture delivers business value. We assert that this value will only occur when usable, consistent definition of the elements, properties and relationships situated within the context of meaningful scenarios are provided. This paper aims to deliver such definitions of key foundational elements, in situ of the beneficiary scenarios.

In the context of this paper a Business Architecture serves as a structuring of knowledge about a business, categorizing that knowledge by its relevant qualities to fully describe a businesses constitutive elements. It would be naïve to suggest that it is easy and appropriate that every business should attempt to model everything into an all consuming Business Architecture. In practice the chaos and messiness of real life often interferes with performing such modeling. Nevertheless this paper contends that within the context of the described scenarios, value can be realized by performing appropriate modeling.

This paper adopts wherever possible element names that are in keeping with common business usage. In keeping with the aim of this paper we have not painstakingly detailed elements and constructs rather we described them at the level of depth necessary for a business reader to follow the significance of the main Business Architecture concepts. Where deemed necessary for clarity we have highlighted where our definition differs from the common understanding.

In summary, we believe that the usage scenarios are an essential instrument to assist Financial Services managers in understanding the value of Business Architecture for their industry. While most of the contents could easily apply to other financial service segments, we have chosen Banking as the preferred segment of the Financial Services industry. Within the body of each scenario's description we depict the element relationships required by the particular scenario. While most of the language used in these models will sound familiar to the expert architect, this paper highlights elements whose proposed definitions have been articulated to be actioanable, thus providing a consistent reuse mechanism.

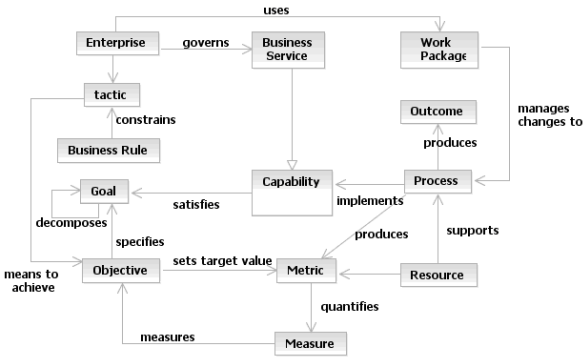

Figure 1. Business Architecture Elements used for Cost Reduction Scenario in Retail Banking

Furthermore, we are concerned with the intuitive interpretation of these models by business decision makers and more generally, people in an organization having a business background and not necessarily possessing Information Technology expertise. For this reason this model has been described to be intuitive for Business Managers as opposed to those created by Information Technology organizations, Enterprise Architecture experts or related standards.

The organization of the paper is as follows, Section 2 contains descriptions of the four usage scenarios and how business architectural elements are applied. While some of these scenarios have been used in other standards organizations[4], we strongly believe that their description is either insufficient or lacking enough detail for a business person to fully understand the potential of Business Architecture. Conclusions and descriptions of future work are contained in Section 3.

II. Business Scenarios

Companies should rely on Business Architecture to assist them in many different aspects of planning and execution of strategy. In this paper we have selected four scenarios: Operational Cost Reduction, Regulatory Compliance Change, Globally Integrated Enterprise, and Application Portfolio Management. These scenarios show the critical role that business architecture elements play in resolving real-life business challenges.

The Operational Cost Reduction scenario examines a situation where management is seeking to streamline the business, for example, through functional realignment, process streamlining or organizational consolidation. The Regulatory Compliance scenario is concerned with understanding how a company determines the direct and indirect impact of new regulations. For example, a change in regulations governing consumer charges might have an impact on business rules, processes and capabilities. The Globally Integrated Enterprise scenario describes what enables an enterprise to transform from being a multinational enterprise to becoming a globally integrated enterprise. The Application Portfolio Management scenario addresses how an enterprise reduces inefficiencies resulting from overlapping or redundant IT functional coverage and facilitates alignment of IT applications with enterprise aspirations.

A. Operational Cost Reduction

As described by the OMG Business Architecture Special Interest Group scenario white paper [4], the operational cost reduction scenario is characterized by management's need to find areas within the enterprise where resource spending can be reduced. This may include functional realignment, process streamlining and optimization, outsourcing or a variety of other approaches.

There are four activities that can be used to operationalize this scenario: development of a performance model, identification of high cost capabilities, analysis of cost reduction alternatives, and scheduling work packages to develop refined outcomes. In detailing these steps we illustrate the critical parts of the Business Architecture model that are involved, as depicted in the figure below:

The first activity in operationalizing this scenario requires an enterprise to express in measureable terms their ambitions and their assessment of current performance. As in several of the prevalent Business Architecture models, enterprise ambitions are

captured through the goal and objective elements. Compared to other prevalent Business Architecture models such as OMG's Business Motivational Model (BMM), we propose a more streamlined set of elements. By limiting ourselves to goals and objectives we eliminate some of the less substantial elements, such as vision, which tend to resemble aspirations rather than actionable architectural elements. Our approach is consistent with the TOGAF (The Open Group Architecture Framework) model in that we define a goal as "a state or condition of the enterprise to be brought about or sustained through appropriate means". For example, a bank's cost cutting goals might include "Reduce operational costs". The emphasis within a goal definition is that a goal is a statement of the desire to provide or enhance certain capabilities. In the above example, this is a desire to be capable of providing bank operations at lower costs than current. Goals, which tend to be somewhat vague, are made more specific through objectives. Objectives are specific time-targeted, measurable and attainable targets that an enterprise seeks to meet in order to achieve its goals. An often applied criterion for objectives is that they should be S.M.A.R.T (Specific, Measurable, Attainable, Realistic and Timely). For example, one appropriate objective that influences the "Reduce operational costs" goal might be "Reduce check processing cost by 50% in the 2nd quarter of 2012".

There are two values in populating goals and objectives: planning and bundling. Planners of enterprise strategy might be able to establish the broad directional outlines for the enterprise, knowing that initial planning does not necessarily indicate the occurring timeframe nor how its fulfillment might be measured. Goals, by their vagueness, allow management to postpone the timing and measurement discussions until consensus is reached on the enterprise's priorities, at which time the further detail might be added. Goals also create hubs where the common threads from otherwise disparate objectives converge, thus allowing comparisons of relative value of the different objectives. This convergence of objectives supports the pursuit of multiple approaches in fulfilling goals.

Returning to the example, planning how the "Reduce check processing cost by 50% in the 2nd quarter of 2012" objective might be attained requires the enterprise to understand both the spending gap that needs to be bridged, and the set of tactics that might be viable. Business Architecture provides elements that are useful for both needs. For the first requirement (bridging the spending gap), the enterprise is capable of modeling and measuring its current performance through two performance related elements: measure and metric. Measure is a statement describing an item of measurement used to gauge some quantifiable component of an enterprise. For example, a measure associated with the earlier check processing costs might be "Average cost to process check". A metric is a quantitative measure of the degree to which a system, component, or process possesses a given measure, for example currently the "Average cost to process check" is $2.50. In our example the objective to "Reduce check processing cost by 50% in the 2nd quarter of 2012" is measured by numerous measures, among them the "Average cost to process check", and "Percentage of payroll disbursements dispensed as manual checks". The objective indirectly sets a target value for the metrics that quantify these measures: a fixed value of "$1.25" (i.e. 50% of the current cost) for the first case, and in the latter case a percentage determined by management as being achievable. Note, these self same measures might be impacted by other objectives, and their corresponding metrics may have other target values as a result of these other objectives. Incidentally, given the prevalence of Key Performance Indicators (KPI)'s it is worthwhile noting that a KPI is a measure whose values are deemed to be of special significance often because they are seen to be representative of a key aspect of the business.

Our proposed model differs from both the TOGAF core meta-model in which a measure and metric value are embedded in an objective and from the Performance Reference Model (PRM)[5] that requires one to have a separate metric for each value (current and to-be). We establish measures and metrics as elements distinct from an objective. This enables one to change how the accomplishment of an objective is gauged without changing the objective. For example, it is possible to record ones progress in meeting the "Reduce check processing cost by 50% in the 2nd quarter of 2011" objective by tracking "Average cost to process check" or more indirectly by tracking "Percentage of payroll disbursements that are manual checks". We also simplify the model by allowing a metric to record several value types, such as target, current and so on, such that the implied target value set by the objective and the current value can both be associated with the same measure. We are therefore now in the position of being able to assess the gap between the target metric values set by the objective and the current metric values that reflect the existing performance.

For the second requirement, understanding what is viable at a high level, business architecture provides, tactics. As opposed to some of the more grounded elements that will be discussed later in the paper, such as capabilities, tactics capture approaches that a bank is deliberating as a means of achieving its objectives[6]. Tactics allow a bank to contemplate approaches to achieve its objectives, given environmental constraints and risks.

Up to this point we have identified the Business Architecture elements that express a businesses ambitions, those that measure their performance, and the means to implement them. These are the elements that compose the first step to operationalize the scenario. The second step entails identifying the high cost capabilities. Capabilities are the proficiencies that an enterprise is interested in maintaining or developing for the long term, exclusive of how they are achieved, that predictably produce a unique set of observable results. However, given that the ultimate purpose is to be able to bring enterprise performance into greater objective-metric target alignment, it is insufficient to merely identify the capabilities that require optimization or streamlining. We also need to be able to assess the processes and their supporting resources (e.g. actors, Assets, Material and Capital) that ought to be analyzed.

To gain understanding of this oftentimes complex analysis, we must be able to observe the effect that individual components from these supporting domains have on the capabilities in question. For instance, if the "Provide Item Clearing" process is the

largest cost contributor to the "Check Processing" capability, then it follows that this process probably warrants optimization. In simple cases, capabilities and their underlying process' metrics can often be directly assessed and associated, since this relationship is often a composite relationship. To illustrate this composition, the "Average cost to process a check" is likely the cumulative costs incurred by the underlying process flows required to process a check, such as "Provide Item Collection", "Provide Item Clearing", etc.

The third operational step where Business Architecture lends support to the operability of the scenario is the identification of cost reduction alternatives. Just as in the prior step, capabilities play a central role in this step. Given that capabilities represent value producing functions, "Check processing" as one such function in a bank must exist. Additionally given that capabilities are unique, capabilities producing the same result are by definition the same capability. Additionally a capability acts as a resource hub, such that a capability is associated with all resources required to enable it. Thus, once one has located the "Check Processing" capability, one is guaranteed that all its associated assets can be optimized with respect to the capability hub. The associated processes that enable the capability can be analyzed using all standard process analysis techniques to identify process optimizations and cost savings. This is in contrast to the process flows involved in the check processing lifecycle in that, unless they were the final process flow in the end-to-end process, would not have "check processed" as a result, in conformance with the standard BPMN definition of a process[7], and consequently would be harder to associate as being of interest. Thus capabilities offer better optimization than processes even if true optimization is only possible when resources are either dedicated to a capability or capabilities partitioned based on their common resources.

Another valuable element of a business architecture that is relevant in the analysis of cost reduction opportunities is the business service element. A business service delivers a capability usually through contractual agreements between the provider and recipient that are governed by the enterprise. In this example, defining the business service interface allows an enterprise to review the costs of procuring a particular capability from external sources that meet both their target cost objectives and other operating criteria.

In the above paragraph we have focused on one of the objectives "Reduce check processing cost by 50% in the 2nd quarter of 2011" that was identified to fulfill the "Reduce operational costs" goal. Capabilities are able to further assist in meeting the "Reduce operational costs" goal by making visible the cost of any of the results deemed to be of value. By contrasting the cost vis-à-vis the benefit of capability results, capabilities where cost savings might be achieved are identified. Such visibility could not be achieved if the enterprise had only invested in modeling processes and their results. Unless the process represented the end-to-end production of a final result, their cost and benefits would be harder to analyze since they might represent cost and benefits of interim results which when combined with their predecessor and successor processes do offer a convincing cost/benefit story.

It should be noted that the metric and measure modeling that was previously discussed, is also of of value in this cost/benefit evaluation phase of the scenario. Capability result benefits can be assessed by examining the values that these results contribute to metric targets set by objectives. For example if the objective is to overall "Reduce operating costs by 25% in the 2nd quarter of 2011", examining the set of capabilities that contribute to total operating costs helps isolate the set of capabilities that need to be examined to influence the objective.

Lastly, Business Architecture assists in the fourth step, scheduling work packages to develop the refined outcomes. Projects, programs and initiatives are types of work packages that represents the work activities that transition an enterprise's capabilities from current state to target state. The work package element allows management to track the progress, cost and fulfillment of changes for capabilities that are going to be reengineered or enhanced. Objectives as defined are comprised of both a measurable metric target and a time period in which they are to be attained. The measures associated with the targeted objectives, the capabilities being enhanced, and the underlying resources being manipulated need to align so that the established project execution time along with the desired metric values to be attained at the conclusion of each of the individual project guide program portfolio management.

B. Regulatory Compliance Change

In general, compliance means conforming to a rule, such as a specification, policy, standard or law. Regulatory compliance describes the goal that corporations or public agencies aspire to in their efforts to ensure that personnel are aware of and take steps to comply with relevant laws and regulations [8]. In the United States, the Federal Sentencing Guidelines manual[9] describes what is considered an effective Regulatory Compliance program within an enterprise. In particular, apart from the enterprise promoting a culture that encourages ethical conduct and commitment to compliance with the law, one of the requirements of the Regulatory Compliance program is to periodically assess the risks of non compliance and to take appropriate steps to design, implement, and assimilate each regulatory requirement. Especially with the slew of regulation being introduced in the Banking industry, regulatory compliance is uppermost in the minds of many banks. This scenario examines the support that Business Architecture provides to meet Regulatory Compliance. This support extends beyond initially establishing a framework for absorbing regulations to also facilitate continuation of operations in face of evolving change, and managing the aftereffects of such change.

One of the first tasks for an enterprise to carry out upon becoming aware of new legislation is to interpret and record them in a form that supports subsequent traceability and transparency. This first step is crucial to the enterprise's ability to capture and explain the effects produced by the new legislation. Secondly, the enterprise needs to formulate the analysis parameters by which it will examine for possible affected resources. Thirdly, support the evaluation of compliance choices. The rest of this scenario's description depicts these steps using a sample banking regulation.

As part of its obligation to comply with legislation, a bank needs to interpret the rulings being issued by governing bodies and craft appropriate business rules. Business Architecture contains several elements that support this exercise: Influencers, Assessments, and Business rules.

As illustrated by recent Federal Banking Regulation E (Electronic Fund Transfers), whose final ruling "limits the ability of a financial institution to assess an overdraft fee for paying automated teller machine (ATM) and one-time debit card transactions that overdraw a consumer's account, unless the consumer affirmatively consents, or opts in, to the institution's payment of overdrafts for these transactions." Note that while the legislation requires that consumers explicitly opt-in, the text of the regulation does not specify what opting in means. Hence, depending on interpretation, compliance may be achieved in one or more ways: consumers opt-in for each transaction, or they may opt-in once when they open their accounts or the may opt-in once per any day in which they access their accounts. Whichever alternative is ultimately implemented, banks need to understand, assess and interpret the legislation into rules. This role in a bank is often the responsibility of the legal department.

Influencer is an element offered by Business Architecture that can be used to capture the legislation that is being evaluated. An influencer is defined as a fact or event that has the capability to produce an effect on an enterprise's ability to enact its means (such as Tactics, Capabilities, Processes) or its achievement of ends (such as Goals, Objectives) without apparent exertion of tangible force or direct exercise of command, and often without deliberate effort or intent[6]. By this definition, legislation is a type of influencer. We have avoided event as an element because of the confusion in the Business Architecture literature surrounding its use. On one end of the spectrum one has the very broad description offered by the SOA ontology, "An event is something that

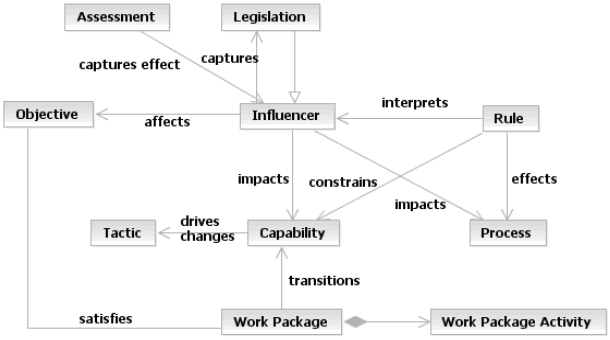

Figure 2. Business Architecture Elements used for Regulatory Compliance Change scenario

happens, to which an element may choose to respond"[11] that offers little specific guidance. On the other end of the spectrum one has the very specific definition "something that 'happens' during the course of a Process that affects the flow of the model and usually have a cause (trigger) or an impact (result)" offered by BPMN[7]. The definition of an influencer that we have adopted above mimics BMM's definition of an event, 'events in the business cycle and how those events cause changes or activities in the enterprise'[6].

Whilst potentially not critical in the execution of this scenario, capturing and recording legislation as passed by lawmakers does ensure a straight line of visibility between the original legislation, the cause of new business rules, and the eventual actions undertaken by the enterprise to be in compliance.

In situations where there is a difference of opinion on the effect of an influencer, Business Architecture offers an assessment element to capture the individual or different evaluations. However, given the nature of legislation, it is most likely that banks will require a consensus on the legal evaluation of legislation, consequently this element will not offer additional benefit.

Although a non-regulation type influencer might exhibit its effects directly on different elements in the Business Architecture, regulation influencers almost exclusively are recorded as business rules. A business rule is defined as a statement that constrains some aspect of the enterprise. It is intended to assert enterprise structure, or to control or influence the behavior of the enterprise. Ronald Ross has defined five tests that a statement needs to meet to be considered a business rule. One such statement is that "The rule must be practicable", which entails the question 'Would a worker who is duly authorized and capable know what to do or not to do when they read it?"[11]. Several business rules are likely to be needed to capture the nuances of a regulation.

The value of Business Architecture so far in this scenario has been restricted to providing traceability from the original legislation to the way that the legislation has been codified for the enterprise. The traceability is achieved via the Influencer, Assessment and Business Rule elements. Additionally, Business Architecture provides a structure whereby the enterprise is able to connect the effects that each business rule has on the functioning of the enterprise to the appropriate affected area.

Having interpreted the legislation and translated them into business rules, the enterprise must determine where changes must occur. Do new business rules require the bank to change operating procedures in some of their standard processes or does the bank need to introduce new capabilities? Business Architecture, and in particular the rigorous definition of business rules, allow a bank to formulate intelligent queries that help pinpoint potentially affected capabilities or processes. OMG's Semantics of Business Vocabulary and Rules (SBVR) specifies that a business rule must contain a noun concept, and most times should actually lead with the noun concept. Such as the 2010 Regulation E rule stating an ATM overdraft fee cannot be charged if the consumer has not opted in. Both ATM overdraft fee and consumer are noun concepts in this rule. Thus, in this example if we are interested in capabilities and processes related to this Regulation E rule, we need to examine capabilities and processes associated with "ATM overdraft fee" and "consumer". Or, more broadly "overdraft fee" and "consumer" since previously overdrafts caused by ATM transactions may not have been separately identified since the distinction between an ATM transaction and other transaction types was not important.

Even when regulation changes rupture the initially established straight through visibility, the earlier work is not in vain. A benefit of the architecture is that the initial modeling can still guide the first steps in analysis, even if subsequently one might need to examine additional areas for impact.

Well structured business rules have substantial hooks into business processes. Researchers at Georgia University [12] have identified several types of effects that business rules can have on a business process. Some example include, rules that influence the sequencing of processes activities or rules that state or constrain the activities of an actor.

Process decision points are another linkage point between business rules and processes. The set of effects and linkage points between business rules and processes stated above suggest that given a business rule, the set of potentially related processes either contain activities being re-sequenced by the rule, actors whose activities are being constrained by the rule, data whose values predicates process flow or behavior, or processes where branch points correspond to logic dictated by the business rule in question. Having established the connection between a business rule and business capabilities and processes, it is less time consuming when a business rule change occurs to identify the initial set of potentially affected capabilities and processes.

The final contribution of Business Architecture modeling to this scenario is its valuable role in supporting the evaluation of alternatives to gain compliance. There are several different questions that potentially need to be evaluated. Firstly, assuming that there are several ways to satisfy the requirements of a business rule, what is the most business appropriate choice? Secondly, what is the impact of diverting funding to cover the cost of implementation on the rest of the project portfolio? In answering the first question, sometimes one might be able to directly compare the changes necessary, for example, business rules with relatively limited effect on capabilities and processes. However, more far reaching legislation might require additional Business Architectural elements so that staging and contemplation of choices might occur. Tactics that were previously defined, afford an enterprise the flexibility to capture several contemplated approaches, and allow management to compare their attractiveness relative to one another. This comparison is achieved by analyzing the conjectured metrics assumed by each tactic vis-à-vis the target performance metrics set by the banks objectives. Thus tactics, related capabilities and processes, permit staging of approaches and comparison of relative effect.

In order to assess the second question related to business rule implementation choices (namely, what is the impact of new legislation and their required remediation on the rest of the enterprise's project portfolio?), one is able to leverage the earlier defined work package. Work packages have two kinds of constraints: project interdependency constraints, such as work package B cannot begin until work package A is completed, and enterprise constraints, such as work package C needs to be completed by a certain date. This second type of constraint is common in situations where work packages implement changes prompted by regulatory compliance since compliance frequently carries an "implementation required by" date. The enterprise's work package portfolio allows it to view a consolidated set of planned and ongoing work packages. Methods exist to allow an enterprise to view resource shortfalls induced by the simultaneous execution of ongoing work packages and allow one to view the effects that delaying certain work packages will have on alleviating shortfalls [13].

Thus in the interpretation of business rules it is clear that Business Architecture is an essential tool that aids in; identifying the areas of the enterprise most likely to be affected by regulatory changes, providing a framework to analyze compliance implementation alternatives, and identifying the enterprise's processes, capabilities, and workpackages that require modifications. However, notice that Business Architecture does not offer any substantial value for rapidly changing legislation. The assessment and construction of business rules remains a manual task and thus any subsequent changes to legislation require reassessment and reevaluation of business rules. This is an area of further research.

C. Globally Integrated Enterprise

Over the last decade, banks have evolved from being collections of country based business units to becoming globally integrated agglomerations of operations. In this new mode, strategic imperatives dictate where and who globally should perform required work. In fact corporations are emerging as combinations of various functions and skills, some tightly bound and some loosely coupled, Corporations integrate these components of business activity and production on a global basis to produce goods and services for their customers[14]. Transforming an enterprise into such a globally integrated entity requires them to pull their different functions and capabilities apart and put them back together again in new combinations while adhering to their strategic mission. Enterprises need to make strategic judgments about which operations to excel at, and which it believes are best suited to be performed by its partners. To support such agility, the Organizational Model needs to evolve from the traditional model, where job titles are tightly linked in the organization's hierarchical structure, to an arrangement that supports a variety of relationships between people. The evolved model produces many forms of working relationships such as teams, communities, and committees. People may have different roles and responsibilities in different parts of the organization, as is the case in matrixed relationships and cross-organizational task forces. Additionally, these relationships may even transcend the enterprise's internal boundaries since modern enterprises must establish integrated and extended relationships with other enterprises.

This scenario describes the aspects of Business Architecture that allow an enterprise to transform from the multinational structure to globally integrated enterprise. What are the elements of a Business Architecture that support such a transition? How does one leverage organizational design to back a transformation? What mapping and relationships need to be established between the organizational structure and other elements of the Business Architecture to enable alignment with strategic business objectives, and ensure operational efficiency and effectiveness?

A globally integrated enterprise (GIE) possesses several key traits. For instance, it embraces collaboration both internally and externally, it is able to access, optimize, and share talent, ideas and innovation on a global basis, and it manages risk globally. We posit that these characteristics require flexible organizational structures that lead to modular businesses composed of collections of orthogonal capabilities. In this scenario we describe how business architecture elements enable these capabilities, in particular through actors, roles and organizational groupings.

In many traditional organizational structures an actor, representing an employee, is assigned to a business unit where he or she fulfills a specific role. Notice that in these structures, the concept of a role is synonymous with the group to which it is assigned, thus inhibiting the implementation of global agility. In fact, modeling an organization as Business Units often does not acknowledge the concept of a role since they only represent a static hierarchical grouping of actors. However, this affiliation is insufficient for a GIE that wishes to encourage internal and external collaboration. Support of such collaboration requires recognition of the multiple roles that an actor in an organization can potentially fulfill, and requires more flexible actor coupling to acknowledge the multiple short lived groupings that occur. Consistent with these needs, an actor in a GIE is defined as someone or something internal or external to an enterprise that has one or more roles in initiating or interacting with enterprise capabilities. Roles are groupings that closely associated with descriptions of the complete set of knowledge, skills, and behaviors required by an actor in performing distinct responsibilities that are associated with the role. Role properties describe both the required characteristics of the role as well as the quantifiable attributes such as cost. Collaboration, i.e. the grouping of roles, is thus supported by allowing the businesses to associate each role with actors internally or externally best suited to deliver each role. An actor is capable of possessing several roles and in participating in several organizational groupings. An Organizational Grouping represents role groupings formed by an organization. Thus an Organizational Grouping explicitly captures the dynamic, often temporary, convergence of roles required within an organization. Thus, rather than having actors and roles inextricably bound, in a

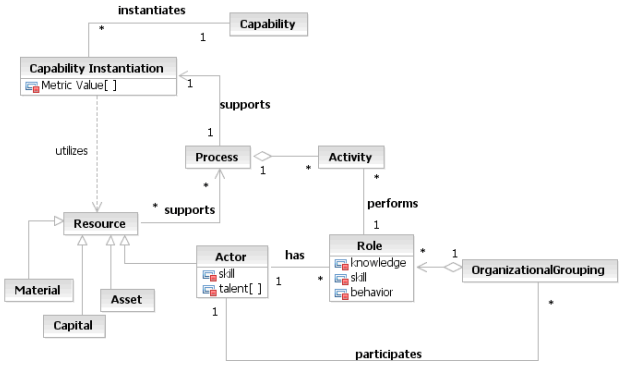

Figure 3: Business Architectural Elements used in Globally Integrated Enterprise scenario

GIE the set of roles associated with an actor can be rapidly changed

For example applying the actor, role, and organizational grouping elements to describe a GIE bank, rather than describing a Branch Manager actor as a functional manager of actors within a physical branch office, we would describe the Branch Manager by the several roles that he or she possesses. A Bank Branch Manager might be able to assume several of these roles, including staff training and branch financial health reporting and thus participate in several organizational groupings In each organizational grouping he would fulfill his appropriate role. In the Bank Branch Manager staff training role, he would tailor and deliver training materials. Thus given the requisite skills, knowledge, and behaviors associated with a role, actors within the bank branch or organization as a whole can be assessed for their role eligibility, enabling a more flexible global organization.

The second key trait associated with a GIE is management's ability to access talent, ideas and innovation regardless of where it is globally situated. Talent represents the aptitude or abilities possessed by an actor. A globally integrated enterprise's management of talent is realized when human resources personnel are able to match required skills sets captured in role properties with the available skill sets expressed by actor attributes, regardless of the global location of the actors. Any organization that is able to perform this pairing of skills to global actors is, in this respect, a globally integrated enterprise.

Given that ideas and innovation are somewhat ephemeral, it is more difficult to enable enterprises to leverage ideas and innovation globally. However there are aspects of business architecture modeling that assist in partially enabling this potential. The capability element, defined in the "Operational cost reduction" scenario, enables enterprises to leverage and rethink best practices, including re-engineering or outsourcing capabilities. In our earlier discussion of capabilities, one of the facets that we focused on was the manner that a capability acts as a resource hub, meaning that it is associated with all the resources (e.g. actors, assets, material and capital) required to enable it. In fact, it is often the case that multiple independent packages of resources are capable of enabling the same capability. In such situations, we refer to these resource clusters as capability instantiations. A capability instantiation is similar to TOGAF's capability increment with the difference that rather than representing discrete, visible, and quantifiable outcome increments aligned with capability enhancements, capability instantiations represent sets of resources capable of supporting a capability at a given level of performance. For example, the set of capability instantiations might represent different local implementations, or current and future planned implementations. Thus, the fact that there may exist a pool of capability instantiations for any given capability, selecting the most innovative and best performing one as indicated by its associated metrics and strategic alignment is, in fact, a means of globally leveraging ideas and innovation. It would be remiss, however, not to point out that this only represents a partial fulfillment of the second trait; innovations in others arenas of the business that did not directly impact a capabilities support are not accounted for in the above.

A more extreme example of leveraging best practices, advocated as part of empowering a GIE is establishing Centers of Excellence (COE). A worldwide Car Rental company for example established a Finance COE, which is responsible for coming up with a centralized set of best practices. The COE analyzed its claims processing methodology and recognized that there was enough commonality between car and equipment rental to enable Hertz to improve the claims function company-wide [15]. The organizational grouping element enables the creation of such globally disparate teams that can band the variety of global subject matter experts (SME's) needed to perform such analysis.

As a large US Financial Firm in 2004 illustrated, after its then chairman was forced to apologize to Japanese regulators after the bank's Japanese office violated local securities laws, merely being able to execute global best practices does not necessarily illustrate that you are in fact a globally integrated enterprise. The abstraction of business rules that can reflect local laws and legislation, are another way in which business architecture contributes to globalization by helping mitigate risk. Disaggregating the business rules and the constraints that they impose of the implementation of a capability, so that a local set of business rules is employed to constrain the implementation of a global capability, can shield an enterprise from unwanted attention.

D. Application Portfolio Management

A top down Application Portfolio Management (APM) approach refers to the practice of inventorying and attributing an Enterprise's IT applications so that the collection can be managed as a portfolio. Being able to holistically view all attributed IT applications is valuable for organizations as it facilitates reduction of inefficiencies resulting from overlapping or redundant IT functional coverage, identification of gaps in IT coverage, alignment of IT applications with enterprise aspirations, and provision of additional context for technology investment decisions. While an IT application element is not a full fledged member of a Business Architecture model, they do appear as part of the asset resources that support Business Processes. In this scenario we describe how Application Portfolio management relies on Business Architecture and corresponding constituent elements in delivering some of its primary benefits.

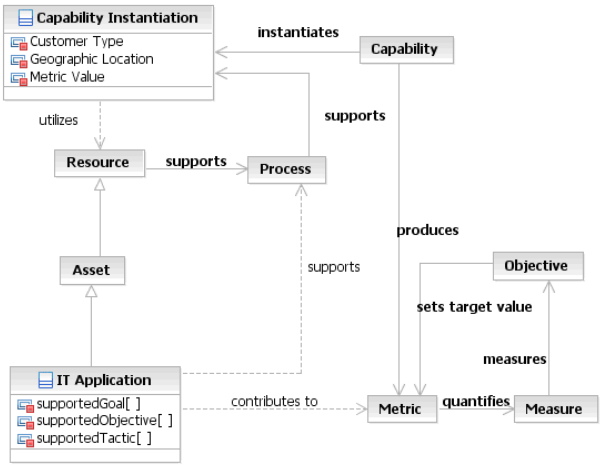

Figure 3: Business Architectural Elements used Application Portfolio Management scenario

We revisit our previous discussion on capabilities to show how Business Architecture assists in identifying IP Application redundancy. Recall that we had indicated how capabilities can often be enabled by multiple independent packages of resources (e.g. Actors, Assets, Material and Capital). We referred to these resource clusters as capability instantiations. When multiple capability instantiations coexist concurrently, especially when the technology portion of the capability instantiation services the same geographic area and customer type, those IT applications are possibly redundant and hence require further analysis. Thus, through capabilities and capability instantiations, Business Architecture is able to assist in the identification of redundant IT applications Note, given that capabilities are not guaranteed to be orthogonal to one another, one can only conclusively identify an IT application as redundant when either those resources are dedicated exclusively to the capability or when capabilities are partitioned based on their common resources (i.e. in order to perform the analysis, capabilities are grouped such that contributing resources are maintained within a single group). . Furthermore, depending on the granularity of capability disaggregation, it may surface that IT applications identified as overlapping at a coarse level of analysis actually are none overlapping and support different, finer-grain capabilities. For example if the "Check Processing" capability has been disaggregated into finer grained capabilities; "Item Collection" and "Item Clearing", IT applications that formerly might have been pegged as being overlapping supporters of the "Check Processing" capability can be correctly identified as respectively supporting "Item Collection" and "Item Clearing". Thus we have illustrated how the capability and capability instantiation elements support analysis of IT application

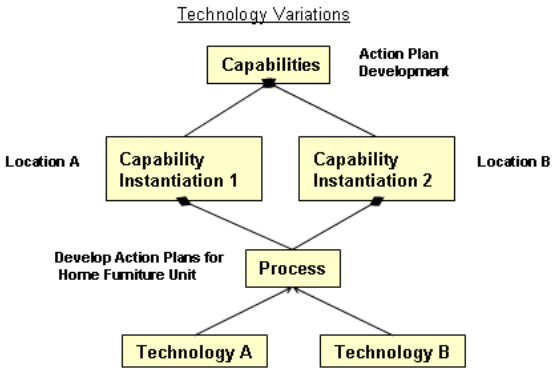

Figure 1. Identifying possibly redundant IT applications

redundancy.

Detecting the gaps in IT coverage can be accomplished by leveraging the link between an IT application and the process steps that they support, along with the additional connections that exist between process and capability instantiations. When capability

instantiations indicate which parts of their functionality are unsupported it is easy to leverage their connection with their parent capability to establish a holistic view that indicates which enterprise capabilities are currently unsupported. In other words, by looking at all the instantiations of a capability, where the instantiations show their respective unsupported parts, it is simple to aggregate the gap at the capability level. Additionally, depending on the breadth of IT application attributes captured, both more sophisticated views can easily be established and queries formulated. Sample queries may yield answers to, for example, which capabilities currently do not have coverage from an application that is on the company's desired IT platform. Likewise a more in depth understanding can be established when IT applications are linked to the process steps capability support gap be visible, but even the specific process step lacking support will be evident.

As indicated earlier another goal of APM is to gain greater alignment between current IT applications and Enterprise Goals. There are several ways that this can be achieved in increasing levels of sophistication, at the most simplistic level by just attributing IT applications with the name of one or more goals. For additional elaboration, identifying the objectives that the IT Applications support enables one to rank and order them by their perceived relevance to the enterprise's strategic direction. A second slightly more illuminating picture can be obtained if the IT applications are further attributed with the tactics that they support. Recall that tactics capture approaches that an Enterprise is deliberating as a means of achieving its objectives. Being aware of not only the objectives but even the tactics that a particular IT application supports further distinguishes and differentiates the more aligned IT applications. Yet another means of supporting IT application alignment presents itself by leveraging the performance thread that links capabilities with objectives. However, this is slightly harder to ascertain given that a capability is measured with one or more performance measures whose target values are set by the objectives that incorporate the same measures. However, if one is able to ascertain an IT Application's contribution to a measure's metric value, then one can derive a numerical score with which to compare an application's contribution to Enterprise's objectives.

While the descriptions above have focused on a semi static assessment and alignment, it should be apparent that if adequate dynamic linkages exist for capabilities, IT applications, capability instantiations, goals, objectives, and measures, Business Architectural elements can help support an ongoing dynamic and what-if assessment. For illustration, leveraging the same connections as before, if one is able to ascertain the contribution that an application makes to the current metric value, one is able to predict the effect that retiring an application will have on the achievement of corporate objectives. Likewise, one would be able identify the resulting gaps in the coverage of capability support should financial support be removed for a particular IT application.

III. Conclusion

We posited that the lack of consistent usable definitions of business architecture elements, properties and relationships situated within the context of business meaningful scenarios deprives management from fully appreciating the business value of Business Architecture. This paper aims at elucidating the elements at the level of depth necessary for appreciating the value they deliver to satisfy four common business scenarios; Operational Cost Reduction, Regulatory Compliance Change, Globally Integrated Enterprise, and Application Portfolio Management. We are concerned with the intuitive interpretation of these models by business decision makers and more generally, people in an organization having a business background and not necessarily possessing Information Technology expertise. For this reason this model has been described to be intuitive for Business Managers as opposed to those created by Information Technology organizations and Enterprise Architecture experts and related standards.

By clearly defining key elements within the context of business scenarios, we have shown for instance how capabilities permeate business architecture, appearing in all four scenarios. They assist in cost analysis in the Cost Reduction scenario by; identifying and clarifying cost optimization opportunities, and through their business service type, the costs of procuring the capability from external sources. Capabilities in conjunction with tactics cooperate in the evaluation of compliance implementation choices, pinpointing the areas where changes are required. Capabilities instantiations support Globally Integrated Enterprises by highlighting and enabling the selection of the most innovative and best performing capability instantiation globally leveraging ideas and innovation. Lastly, capability instantiations are one of the enablers in identifying IP Application redundancy.

There are several significant ramifications that should be evident from this paper. Firstly, the benefits of modeling ones business architecture accrue even when only some elements are modeled and hence does not need to be undertaken simultaneously as an ensemble. Aside from the capability element that co-occurs in all the scenarios other elements, such as business rules, only occur in some of them. Secondly the granularity and thoroughness in identifying and documenting elements varies by the needs that the Enterprise has. A capability framework needs to be substantially more exhaustive when it is being used to pinpoint changes than when it is merely highlighting business areas aligned to business objective needs.

The Business Architecture described was constructed with appreciation to the work that has preceded it in the many standard bodies and with an eye on the way that some of the tools on the market have created partial or more complete implementations of these standards. The goal has been to honor "Everything should be made as simple as possible, but not simpler".

IV. 4. Future work

This paper exhibited why a business manager should be interested in Business Architecture and illustrated the business case of such a need. Future papers will offer guidance on how to identify capabilities. What are the rules and heuristics that indicate well defined capabilities? Does a banks need for opening accounts via mobile devices indicate a new capabilities or an enhancement of an existing capability? What are the appropriate levels of capability decomposition? At lower levels of decomposition, a capability appears to include a description of how it is accomplished, blurring the line between capabilities and processes. Additionally we will revisit the formal definition of Business Architecture in more depth, providing a more actionable instrumentation for the applications discussed in this paper and others commonly needed by organizations in this industry.

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