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Leveraging SOA, BPM and EA for Strategic Business and IT Alignment

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Abstract

The alignment of business and IT, in order to support business agility and transformation, is one of the most important topics on today's enterprise agenda. The compelling promise of each discipline of Service-Oriented Architecture (SOA), Business Process Management (BPM) and Enterprise Architecture (EA) is the facilitation and acceleration of that alignment. However studies and experience suggest that even greater value can be gained through the architectural convergence of these three.

IBM believes that a long-term effective enterprise transformation is assisted by the application of SOA principles to BPM and EA in a synergistic fashion. Put simply, in a service-oriented environment the foundational SOA solution platform provides the IT solution design, BPM provides the business optimization and a framework for business solution development, and EA provides, and governs the implementation of, the master plan ensuring synergies across the enterprise.

Not all best practices apply equally well across a maturity continuum. For example using advanced best practices too early in an organization not yet able to exploit them may lead to frustration and inability to execute. On the other hand, a successfully initiated enterprise transformation can stall if the initial approach is not evolved as the program matures. A good understanding of adoption patterns, synergies and natural evolution paths across SOA, BPM and EA is a key foundation for guiding a business and IT alignment effort. The IBM platform supports and provides freedom to choose the right initial adoption pattern, gaining rapid value, yet is rich enough to carry long-term synergies as the scope and maturity of a transformation initiative expands over time.

Enhanced communication across business and IT is critical in order to succeed. Different communities need different tools and methods, each having different purposes, such as planning changes versus delivering solutions. While work products used for different purposes may possibly have similar graphical renderings, the different objectives for these work products leads to differences in target roles, tool capabilities and integration with other tools. Collaboration across the enterprise lifecycle is brought to life through shared principles and building blocks, which points to the need for a synergistic and integrated architectural platform. To meet these requirements the IBM platform integrates infrastructure, tools, methods and best practices.

This whitepaper describes the key architecture and lifecycle principles for the convergence of SOA, BPM and EA in support of a business and IT alignment platform. It also suggests natural adoption patterns depending on the most pressing needs and maturity of an organization. The primary audiences for the paper are architects and leaders involved in enterprise transformation activities and BPM solution delivery driven by SOA.

Management Summary

As enterprises struggle with the rapid pace of change in markets, business goals and technologies, managing change and achieving business agility become key issues. In this world of change each discipline of Service-Oriented Architecture (SOA), Business Process Management (BPM) and Enterprise Architecture (EA) provides important value to the organization. Each discipline can be applied in isolation:

- Agile business solutions: SOA principles enable flexibility and improved time to market in IT supported processes and business solutions
- Business optimization: BPM optimizes and enables business operations through process definition, customization and deployment
- Strategic planning and guidance: EA merges strategic business and IT objectives with opportunities for change through portfolio gap analysis, transition planning and architectural governance

Yet as important and valuable as these are in isolation, IBM believes that a long-term effective enterprise transformation is assisted by the use of all three disciplines in a synergistic fashion through which the organization can gain even greater value.

This whitepaper describes the foundation for that greater value proposition. The primary audiences for the paper are architects and leaders involved in enterprise transformation activities and BPM solution delivery driven by SOA.

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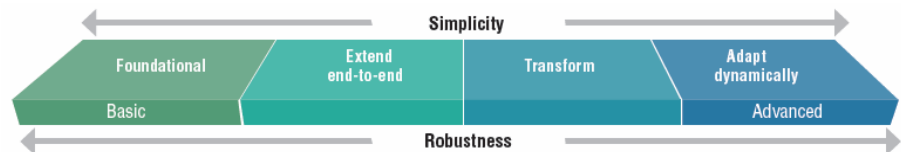
1. Introduction to IBM's view on Business and IT alignment

Today's businesses are striving to be successful in the face of rapidly changing markets, business goals and technologies. Measurable business value and time to market are more critical than ever. Managing change and being able to respond effectively with agile business solutions is a key issue, in fact IBM [1] shows that CEO's have business agility and improved business and IT alignment at the top of their agendas. Businesses are asking:

- Are my day-to-day operations supporting business strategy?
- How do I get the right information at the right time to optimize my decision making?
- How do I demonstrate value in advance to ensure we are investing in the right projects?
- How do I ensure we know what we are asking for, and get it?
- How do I speed up our responses to market changes?
- How can I focus on our core competencies, collaborating with providers for less critical needs?

Questions such as these all address traceability to strategy, visibility across business and IT boundaries as well as flexibility in responding to change. Resource constraints and rising IT costs add to the complexity.

Studies such as the "McKinsey survey and analysis of 100 companies in France, Germany, UK and the US" [2] show that aligning business and IT efforts results in double the productivity gains of those efforts in isolation. IBM's Smart SOA™[3] helps accelerate business and IT alignment through a continuum of best practice based approaches:



- Foundational: Establish a SOA platform focused on supporting immediate departmental project needs
- Extend end-to-end: Extend solutions to span the entire enterprise and its external stakeholders
- Transform: Actively plan business and IT transformations based on strategic goals

- Adapt dynamically: Monitor and adapt continuously to threats, opportunities and changed requirements

In a recent report [4], Gartner states that an effective SOA requires greater degrees of collaboration across business and IT personas as well as a more explicit notion of a future solution architecture. In general as an enterprise moves towards more advanced transformational business objectives, scope and impact grows beyond the project level. Shared understanding and clear communication across Line of business and IT is strongly related to effective SOA governance [5]. In fact, managing an enterprise transformation requires continuous understanding of the impact of change from strategic planning through to solution delivery. At a minimum this involves creating the right building blocks, governing their use to ensure they solve the right business problems in the right way and preplanning as much as desirable or practically possible.

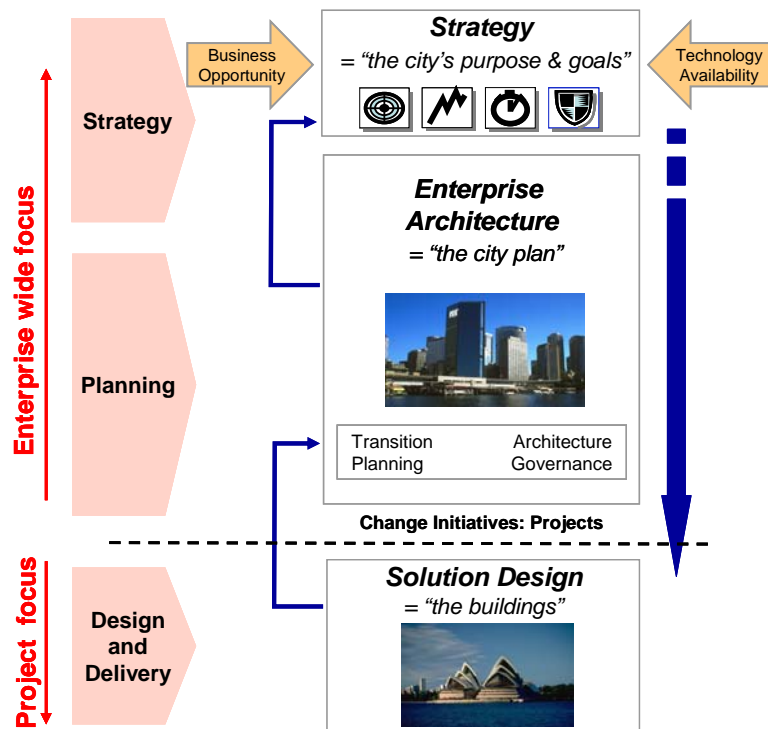


Figure 1: Hierarchical View of the Enterprise

Figure 1 illustrates how a hierarchical view of the enterprise includes all of enterprise strategy, enterprise-wide planning and project-based solution delivery. Enterprise strategy is defined as a balance between business opportunities and technology constraints. Enterprise planning then applies Enterprise Architecture to create the city plan for the enterprise, identify relevant change initiatives and through transition planning and architectural governance guide the projects executing these changes. Projects on the other

hand focus on solution design and delivery for the intended change for which each is responsible.

IBM as part of the SOA foundation [6] has introduced the SOA Lifecycle addressing solution design and delivery:

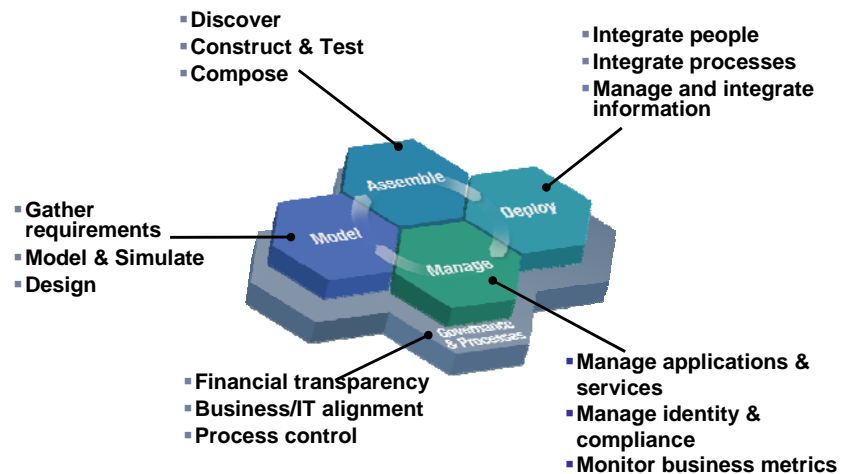


Figure 2: The SOA Solution Delivery Lifecycle

As discussed above, and as illustrated by the more advanced approaches on the SOA continuum, a mature enterprise transformation effort would encompass not only solution delivery, but also enterprise planning. The steps of an enterprise planning cycle are typically standardized via EA frameworks such as The Open Group Architecture Framework (TOGAF), yet an EA framework does not in itself enable the necessary interaction between enterprise planning and solution delivery. IBM believes that a long-term effective enterprise transformation is assisted by the application of SOA principles to both Business Process Management (BPM) and Enterprise Architecture (EA) in a synergistic fashion, the architectural pattern of which is described in this white paper. While retaining leadership within each of SOA, BPM and EA¹, it is IBM's strategy to establish a platform that enables their combined use in highly synergistic ways, integrating infrastructure, tools, methods and best practices.

As illustrated by the following table, each of SOA, BPM and EA individually facilitates and accelerates business and IT alignment:

¹ The IBM EA portfolio includes the IBM EA consulting method and, with the acquisition of Telelogic, the market leading EA tool System Architect.

	Base definition	Main value proposition	Key results
SOA	An architectural style for business and IT that enables flexibility and improved time to market for integrated solutions	Agile and aligned business and IT design and delivery <i>"The right solutions supporting the right time to market"</i>	Improved business agility Lowered cost Reduction of risk Delivery of reusable and flexible services Low-maintenance, standards-based integration Aligning business processes with the services supporting them SOA Governance as a catalyst for business and IT alignment
BPM	A solution delivery discipline ² , based on SOA practices, that drives business agility, efficiency and optimization around organizational concerns and measurable business objectives	Business optimization and IT responsiveness via process definition, analysis, customization and deployment <i>"The right organizational resources doing the right things"</i>	Collaboration to predict and optimize process outcomes and operational efficiency Rapid deployment of new solutions from reusable building blocks Rapid customization of flexible processes Real-time sensing and response to business events providing end-to-end visibility and actionable insight
EA	An architectural discipline that merges strategic business and IT objectives with opportunities for change and governs the resulting change initiatives	Driving portfolio planning in a strategic context and directing change toward common enterprise goals <i>"The right changes enacted the right way"</i>	Faster, better-informed, strategic and tactical decisions with validated results Prioritized investments to support business goals Improved risk management of organizational transformation Enterprise-level communication and visibility for people, processes and assets Standardization and governance of shared business and IT building blocks

² Business process solutions may be delivered to the business operational environment with or without IT enablement, yet will always have operational efficiency as a key factor. The delivery of optimized business processes through non-IT means, such as documented operational procedures, is completely analogous to the delivery of for example IT-enabled workflows. Both types of solutions are encompassed by the discipline of BPM. Note that business process analysis and modeling techniques apply to both IT-enabled and non-IT solutions, see Section 4 for more details on the different uses of these techniques.

However even greater value can be gained through their architectural convergence. Put simplistically, in this service-oriented environment the foundational SOA solution platform provides the IT solution design, BPM provides the business optimization and a framework for business solution development, and EA provides, and governs the implementation of, the master plan ensuring synergies across the enterprise, visualizing and driving the connection between business objectives and change activities carried out by projects. All of this occurs in the context of realizing enterprise strategy and vision.

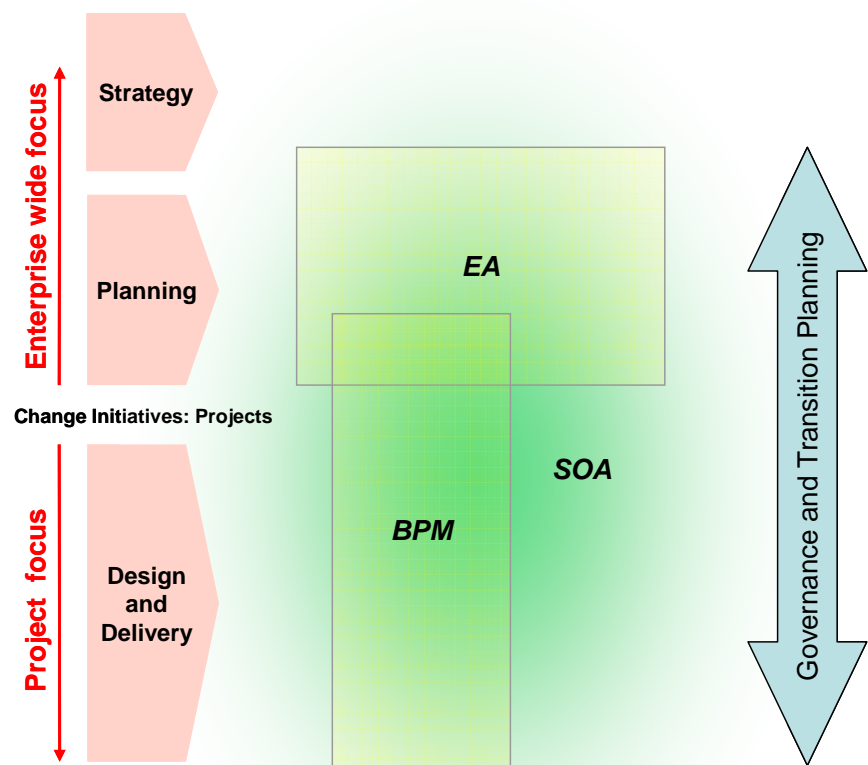


Figure 3: Simplistic view of SOA, BPM and EA interaction

The architectural pattern clearly links the enterprise planning cycle with the solution delivery cycle. Leveraging service-oriented portfolio gap analysis the enterprise planning cycle transforms strategy into a roadmap of specific change initiatives, and governs the execution of that resulting roadmap. The SOA lifecycle then drives solution delivery in the context of one or more specific projects in the roadmap. All of which is illustrated in Figure 4, with

architectural and SOA governance providing an important part of the linkage between the two cycles:

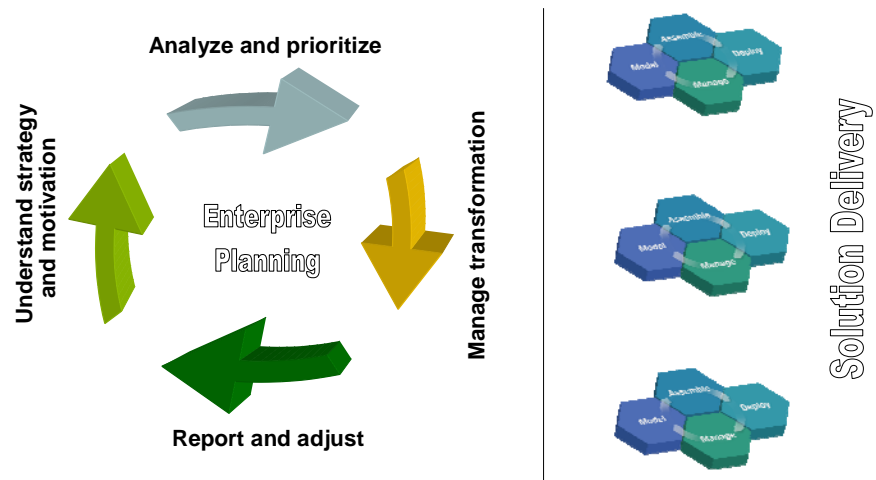


Figure 4: Enterprise Planning and Solution Delivery

Yet because the two cycles have different scopes and purpose, they are not linked in any linear or hierarchical fashion. The differences between the extended timeline and enterprise perspective of a roadmap and the execution of a specific project with limited scope and deadline simply makes it undesirable to combine the two cycles into one. As an example, consider a five-year roadmap for a business merger. Even though the intended end result is known, it would be impractical to analyze all projects in the roadmap in solution level detail before delivering and acting on a definition of the roadmap itself. Similarly for an SOA transformation roadmap it is impractical to analyze the entire legacy portfolio before being able to deliver a single new SOA solution. This illustrates how planning and delivery activities are typically interleaved, alternating and iterating as objectives and assets evolve over time.

Note that within a business and IT alignment context both the enterprise planning cycle and the solution delivery cycle needs coverage across business and IT, including all relevant conformance and key performance indicator (KPI) monitoring. The level of detail and the rigor of governance may vary depending on environment and corporate culture, yet some amount of planning and some amount of delivery always occurs in order to ensure that the goals of the business are being met.

2. Lifecycle Principles for Business and IT alignment

As noted above, SOA, BPM and EA all play a role in facilitating and accelerating business and IT alignment. So how do we untangle these interrelated disciplines and identify the key principles underpinning their interaction and synergies? How do we gain knowledge to assist us in structuring the interaction between enterprise planning and solution delivery? Which shared concepts facilitate understanding, clear communication and extensive collaboration across Line of business and IT? What are the enablers for managing change?

The following four lifecycle principles can help ensure a cohesive and coherent alignment between business and IT³.

#1: Separate Enterprise Planning concerns from Solution Delivery concerns

A clear separation of concerns is important simply because the two types of activities are targeted at different purposes and roles. The enterprise planning cycle results in enterprise blueprints that define a desired future state and are used to prioritize, select, guide and govern the execution of projects. Examples of enterprise blueprints are organizational blueprints, enterprise data models and standard network topologies. The solution delivery cycle results in solution constructs deployed in the business and IT operational environments. Examples of solution constructs are business processes, software design models and actual network designs.

As seen above in Figure 4, the two cycles are non-linearly linked and should not be combined to one. Each cycle is critical in its own right and needs to be distinctly defined. Furthermore each cycle must be visible across the enterprise. Without full visibility of the enterprise planning cycle, the scope or impact of the planning activities will be limited. Without full visibility of the solution delivery cycle, architecture governance is hard and mechanisms to feed experiences and new solution building blocks into the next iteration of planning are lacking. Full visibility does not imply that all solution delivery projects must necessarily adopt the same development method (though that would make collaboration and integration easier). Specifically, applying service-oriented principles to enterprise planning does not exclude non-SOA based solution delivery projects. Enterprise planning on the other hand should follow one fixed methodology across the enterprise.

³ These four principles together define a converged architectural foundation. Additional normative guidance is typically needed for any given deployment.

An important side note, reinforcing the need for separating these different concerns, is that the two related cycles have very different funding models. Solution delivery is directly project funded, each project providing measurable value from its delivered result. Enterprise planning is indirectly funded. In the short term, enterprise planning is perceived as a cost center. However, long-term, enterprise planning increases the efficiency and effectiveness of the organization. This increase comes about by ensuring that projects are aligned with enterprise business priorities and governed to deliver and re-use enterprise assets. The value of enterprise planning is in most cases not realized without a viable and visible link to the solution delivery cycle, hence EA is best when it is approached as investment.

#2: Separate shared building blocks and principles from designs and constructs using them

While it is tempting to directly connect enterprise blueprint designs to solution constructs, typically this approach fails. Simply stated, enterprise planning and solution delivery are very different concerns with incomparable intentions and work products. For instance, there is no direct translation between an organizational blueprint outlining a desired future organizational structure and the business processes that are part of a new accounting solution. Understanding the relationship between the two types of model requires first understanding the building blocks used to construct each of them, building blocks such as standard roles, activities and services. What we need in order to provide a dynamic, bidirectional link between enterprise planning and solution delivery is an explicit awareness of architectural principles, enterprise patterns and reusable solution building blocks.

Figure 5 illustrates the dynamic relationship between different types of models and a collection of shared building blocks facilitating their construction:

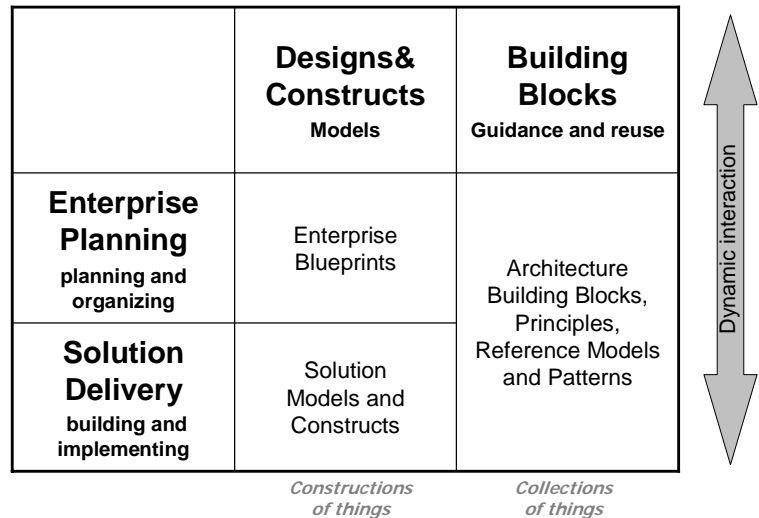


Figure 5: Effective Collaboration in a Lifecycle Context

In one direction, we should synthesize the principles and patterns of the enterprise, using these shared building blocks to govern solution delivery projects. This will give us better span of control in achieving a collective and coordinated impact across the project portfolio. In the other direction, mature solution delivery projects should synthesize and leverage their experiences and solution designs to produce shared building blocks to add to the enterprise inventory of reusable components. Solution organizations should take ownership of their contributions to the enterprise portfolio, and ensure that their projects remain aligned to the enterprise architecture.

The collection of shared building blocks to the right in Figure 5 needs to be managed across the enterprise, and becomes the foundation for designs and constructs to the left in the figure. Some constructs are enterprise blueprints, aligning the designs of the enterprise with strategy and objectives. Other constructs are part of a solution in a project context. Some building blocks have enterprise scope, such as reference models and principles. Other building blocks are primarily reusable solution-centric assets.

Separating concerns into building blocks and designs will facilitate effective collaboration and communication between the planning teams and the delivery teams in an organization, keeping the architecture consistent, dynamic and alive. In the example above, the standardization (as building blocks) of accounting activities and the organizational roles performing them, will help bridge the gap between the enterprise design represented by the new organizational blueprint and the solution constructs represented by the business processes of the new accounting solution.

#3: Implement active transition planning and architectural governance

Some enterprises are initially closer to their end goals than others. Yet in an ever-changing environment a continuous stream of projects will always be required⁴. Ongoing transition planning is needed to ensure that each solution delivery project moves the enterprise closer to current strategic goals, which in turn requires architectural governance across the portfolio of projects and products. In fact, typically enterprise planning only delivers tangible value when the resulting knowledge is applied to transition planning and architectural governance. In this context the downstream guiding and governing is as important as the enterprise planning activities themselves.

Combining principles #1 through #3 results in

- the Enterprise Planning cycle establishing and driving the necessary changes
- the Solution Delivery cycle enacting the changes and synthesizing experiences as well as producing a new current state for the next iteration of Enterprise Planning
- and finally, Architectural Governance providing coordination and management of the ongoing transition through shared principles and building blocks

all of which needs to occur in a collaborative fashion across business and IT.

#4: Separate Business Architecture concerns from Information Systems Architecture concerns from Technology Architecture concerns

Business and IT alignment is not restricted to providing Line of business with the right level of IT support, but rather includes optimizing both business operations and technology platform across the enterprise. Consequently some building blocks and constructs will be focused on the business only, without direct recognition of the use of IT (IT implementation neutral, Business Architecture). Some will be business-dependent IT, automating or digitizing parts of the Business Architecture (IT support for Line of business, Information Systems Architecture). Some will be pure

⁴ Consistent with mature SOA organizations seeing their SOA initiative not as a traditional project, but rather as a long-term enterprise transformation.

technology, the IT operational environment of the enterprise (business independent infrastructure, Technology Architecture).

Figure 6 visualizes the architectural structure inherent in principles #1 through #4:

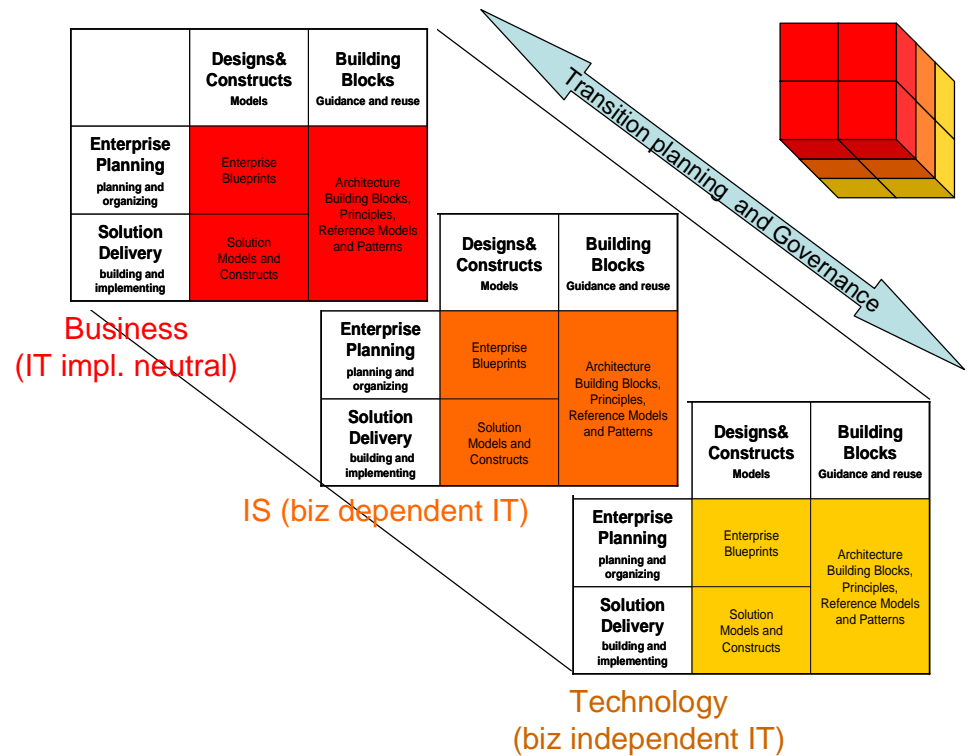


Figure 6: Architectural Framework for Business and IT Alignment

Both the enterprise planning cycle and the solution delivery cycle unfold across all three planes of architecture. Business architecture includes things like organizational blueprints (as planning designs), business process models (as solution designs) and standard roles (as building blocks). IS architecture includes things like enterprise data models (as planning designs), software design models (as solution designs) and software components (as building blocks). Note that IS architecture encompasses data and information architecture aspects. Technology architecture includes things like standard network topologies (as planning models), actual network designs (as solution designs) and standardized router components (as building blocks).

Most business and IT alignment initiatives explicitly or implicitly have within their scope assets of all three types. By splitting into three distinct labeled architectures an organization may ensure proper separation of

concerns and the necessary focus on all three. Realization of a design or a construct may then occur either within a plane, driving higher level of detail, or across planes, driving IT support for a business blueprint or solution.

The full structure of Figure 6 provides a framework for understanding the relationships, adoption patterns and synergies of SOA, BPM and EA in support of business and IT alignment (for typical adoption patterns see Section 3). This framework is in fact an instantiation of what has been labeled Actionable Enterprise Architecture⁵, an instantiation with the advantage of explicitly calling out the context of and relationships between roles in the enterprise:

- Business Executives focusing on transition planning for the Business Architecture, linking business objectives to prioritization of projects
- Enterprise Architects focusing on Enterprise Planning across the three planes of architecture, establishing and driving the necessary changes across the enterprise
- Business Architects focusing on Business Architecture vision and blueprints, establishing the business context across projects in the enterprise roadmap
- IT Architects focusing on aligning the IS and Technology Architectures across the enterprise, optimizing and standardizing this part of the enterprise architecture
- Solution Architects focusing on Solution Delivery across the three planes of architecture, architecting deployable solutions in an efficient and effective manner for each project in the enterprise roadmap
- Business Analysts focusing on Solution Delivery, creating and realizing the Business Solution design for each project in the enterprise roadmap

These six roles are examples. Similar contexts apply to other roles, all based on the shared architectural framework.

3. Adoption Patterns & Synergies across SOA, BPM & EA

Is there a uniquely optimal adoption pattern across the SOA, BPM and EA space? The honest answer is that no single optimal adoption pattern exists. Adoption patterns and synergies should be discussed in a lifecycle and purpose-based context. To exemplify:

- Sometimes you simply know which things to do next, hence you should focus primarily on Solution Delivery. On the other hand, sometimes it is

⁵ See [7] for a definition of Actionable Enterprise Architecture.

important to coordinate, plan and prioritize in advance, leading to more of an Enterprise Planning focus

- Sometimes the most important objective is defining the future state of the business, hence your focus will be primarily on Business Architecture. On the other hand, sometimes the most pressing problem is lack of a shared technology platform, leading to more of a Technology Architecture focus

Historically EA has often been perceived as mostly focusing on technology standardization, yet has over time evolved to become much more than that. In fact, within a business and IT alignment context, any architecture must explicitly include the business aspects of the enterprise⁶ as well as the underlying IT support. Furthermore, whatever the appropriate adoption pattern across the SOA, BPM and EA space, an adaptable and integrated architecture platform is needed to support effective collaboration tailored to the context and purpose.

This section provides an overview of four typical adoption patterns, not to be confused with the broader concepts of SOA, BPM and EA themselves. While not a complete list of adoption patterns supported by IBM tools and methods, these four are illustrative subsets of the business and IT alignment space. They have independent value propositions, yet it is important for an organization to understand how these value propositions may supplement each other, and how to achieve increased effectiveness through synergies as applicable across different parts of the enterprise. To that purpose each adoption pattern has a defined mapping to the architectural framework in Figure 6, and for each it is indicated how synergies may be derived by timely expansion into other parts of that framework.

Not all practices apply equally across a maturity continuum. For example using advanced practices too early in an organization not yet able to exploit them may lead to frustration and inability or refusal to execute. On the other hand a successfully initiated enterprise transformation can stall if the initial approach is not evolved as the program matures. All of which makes an integral platform with natural evolution paths a key success factor, exemplified at the end of this section by the notion of an actionable architecture pattern.

⁶ Service-orientation inherently includes business aspects. TOGAF has also moved in this direction over its last several versions, culminating in version 8 which explicitly includes separate notions of Business Architecture, IS Architecture and Technology Architecture.

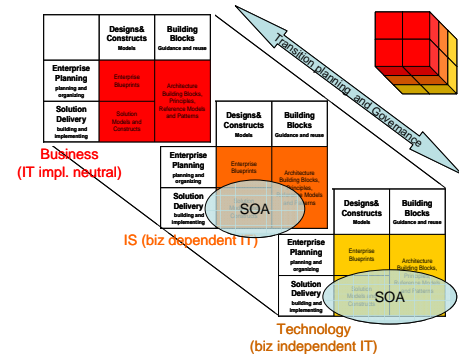
3.1. Adoption Pattern: SOA IT Solution Platform

Theme: SOA-based IT design and delivery

Key roles: Service Owner, Service Architect, IT Developer

Key work products (as IS solution constructs): Service Models, Software Design Models, Service Implementations

Key technology building blocks: Service Registries and Repositories, ESB's



With focus on only the IT aspects of service-orientation, the core value proposition of this adoption pattern is IT development efficiency, agility, reuse and maintainability.

Initially an SOA IT solution platform may be established with little to no advance enterprise planning, simply using a service registry to synthesize and reuse assets built in solution delivery projects or mined from existing software.

Long-term though, synergy and direction will follow from the ability to create service maps, such as produced by IBM's Service-Oriented Modeling and Architecture (SOMA) methodology, laying out the desired structure of services across an enterprise. In this context, SOA governance will play a key role as well, driving architectural governance all the way through delivery and deployment. Developing for and with reuse can be challenging, bringing conflict and tradeoffs between the immediate needs of a project, and the longer-term aspirations of the enterprise. A good governance system can help achieve higher service reuse, and overcome the tendency for individual solution delivery projects to make independent and localized decisions about service architecture and design.

A natural evolution path for a Business and IT alignment effort would be adding BPM as the next step, driving optimization of the business solution architectures. Note that one of the promises of the concept of service-orientation is enhanced business and IT alignment, which indicates caution if a business connection is missing. With BPM's inherent relationship between business processes and services, BPM is a natural fit for that business connection.

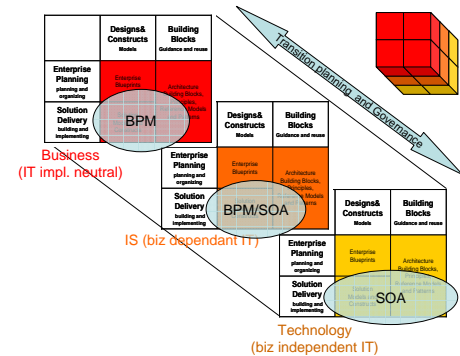
3.2. Adoption Pattern: SOA-based BPM

Theme: Business and IT alignment in Solution Delivery

Key roles: Business Owner, Business Analyst, Solution Architect, IT Developer

Key work products (as business and IS solution constructs and building blocks): Process and Service Models, Process and Service Implementations, KPI's to enable business monitoring

Key technology building blocks: Service Registries and Repositories, ESB's, Process Execution Engines, Process Monitoring Engines



The core value proposition of this adoption pattern is business optimization and agility plus development efficiency and maintainability. Business solutions may be delivered to the business operational environment with or without IT enablement, yet will always have operational efficiency as a key factor.

The process analysis part of a BPM initiative will invariably provide a minimum level of enterprise planning through incorporating end-to-end processes (typically across Line of business boundaries) as first class members of solution architectures. BPM as a concept can deliver creative business agility. Yet approached (inappropriately) without clear business objectives, an entry-level BPM initiative may often end up only optimizing existing business processes and solutions, as opposed to transforming the enterprise as a whole, or even large segments of the business in which greater synergies remain untapped.

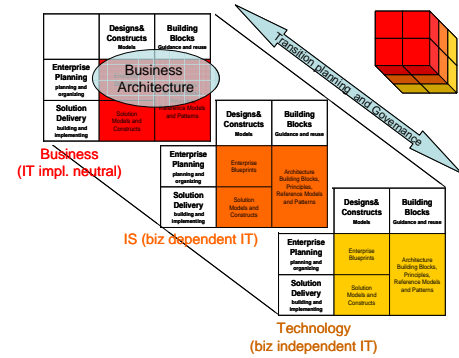
A natural evolution path for a strategic business and IT alignment effort would include a business architecture, driving business transformation towards strategic business objectives.

3.3. Adoption Pattern: Business Architecture

Theme: Business transformation

Key roles: Business Owner, Business Analyst, Business Architect

Key work products (as business planning designs and building blocks): Business Blueprints, Business Components



The core value proposition of this adoption pattern is business alignment with strategic direction and objectives for the Enterprise, including establishing a sound transition planning base.

A Business Architecture initiative is mainly focused at enterprise planning, providing the business blueprints that align Line of business with strategic direction and objectives. Even though many methods exist for developing business blueprints, most of them do not support identification of Business Components or other types of self-contained architectural building blocks, hence lack the ability to use such shared building blocks for effective business transformation. IBM's Component Business Model (CBM) methodology as well as IBM's EA methodology does include the notion of Business Components and Business Architecture building blocks, using these to streamline the overall Business Architecture (including sourcing) and to identify which parts of the enterprise are to be selected for transformation.

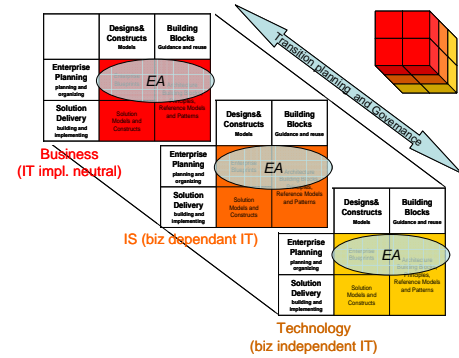
As Business Architecture on its own does not address solution delivery aspects, it is critical to provide this connection explicitly. A natural evolution path would add a BPM platform as the execution engine for the changes being delivered. In another direction, Business Architecture on its own does not address the enterprise planning aspects of business and IT alignment. A natural evolution path in that direction would see Business Architecture as a core component of a larger enterprise architecture.

3.4. Adoption Pattern: Enterprise Architecture

Theme: Portfolio strategy and planning

Key roles: Business and IT leaders, Enterprise Architects

Key work products (as planning designs and building blocks across the three architectures):
 Architectural blueprints,
 Architecture building blocks



The core value proposition of this adoption pattern is architectural alignment with strategic objectives across business and IT resulting in a more efficient exploitation of assets in achieving business goals, and an overall lower total cost of ownership.

An Enterprise Architecture initiative is mainly focused at enterprise planning and change management, providing the enterprise blueprints for architectural alignment across business and IT as well as the necessary guidance for solution delivery projects. The difference compared to a standalone Business Architecture initiative is that most Enterprise Architecture initiatives while also focusing on transformation tend to focus more on holistic understanding of synergies, architectural standardization and business and IT interaction. Enterprise Architecture tools and methods enable broad enterprise planning across all of Business Architecture, IS Architecture and Technology Architecture. A mature business architecture, in this context as a core component of the enterprise architecture, provides the business transformation objectives that drive enterprise planning.

Tangible value in an EA initiative may for example be derived by answering questions such as what services do I need? What functionality will they provide? Who will be the suppliers of these services? When will they be available? What will they cost? What business capabilities will they provide? The knowledge so gained can be used in providing dashboards and impact analysis to assist in prioritizing, planning and governing the portfolio of projects.

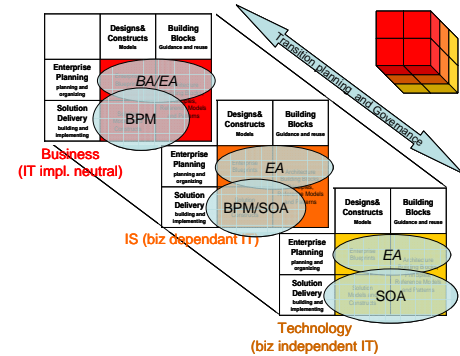
IBM recommends choosing a service-oriented enterprise architecture approach, as this enables a solid link to a BPM/SOA solution delivery platform. As mentioned above, an integral connection between Enterprise Planning and Solution Delivery is critical for the long-term value generation of EA, hence it typically does not make sense to go through an EA deployment without (at some point) setting up that connection.

3.5. Architectural Synergies on the SOA Continuum

Theme: Actionable Architecture

Key roles: Business and IT leaders, Business Architects, Enterprise Architects, Solution Architects

Key work products (across the three architectures): Architectural blueprints, Architecture building blocks, Solution Designs



Foundational SOA projects mostly focus on technology and IS solution issues. Yet as an enterprise moves toward more advanced and mature levels on the SOA continuum, the scope and impact of projects grow beyond the departmental level. The concerns of the SOA initiatives extend from the bottom right part of the architectural framework to the strategic business alignment at the top left.

With projects maturing through extending end-to-end, transforming the enterprise and adapting dynamically to change approaches, enterprise planning becomes critical. Business architecture directs and governs SOA-based BPM solutions. IS architecture with SOA governance coordinates and controls IT support for processes and services. Technology architecture standardizes the SOA foundation platform across the enterprise.

In the other direction, the disciplined and systematic approach to SOA and BPM solution design impacts the enterprise architecture, leveraging service-oriented principles and experiences in the enterprise planning activities and in establishing architecture principles.

An actionable integration between enterprise planning and solution delivery across all planes of architecture is what ultimately drives strategic business and IT alignment. With the convergence of, and architectural synergies between, SOA, BPM and EA, service-orientation becomes not only the enabler of business and IT alignment, but also the key factor making that alignment actionable.

In the context of the SOA continuum, the notion of actionable architecture is in the advanced part of the spectrum, where SOA principles apply across the full architectural framework. As discussed above, not all practices apply equally across a maturity continuum, hence care should be taken to create an appropriate SOA roadmap with sections 3.1 through 3.4 being a set of possible initial adoption patterns and actionable architecture being a transformational end goal.

4. Tooling Requirements in a Lifecycle Context

As indicated above, enhanced communication and collaboration is a key enabler for business and IT alignment, which quickly leads to a discussion of appropriate tools. In a lifecycle context it is not enough to simply pick a tool, it is critical to consider what you want to use that tool for, which roles it should support through which parts of the enterprise planning and solution delivery cycles, and what integration to other roles and tools are needed.

While work products used for different purposes may possibly have similar graphical renderings, it is still absolutely necessary to keep them separate as they play different parts across the lifecycle structures and are not to be confused with each other. As an example, consider that both EA and BPM tools provide process modeling capabilities supporting the creation and rendering of process flow models. Yet a process flow acting as an enterprise planning blueprint (standard or vision) is not at all the same as a process flow denoting the orchestration of a BPM solution (deployable). Examining this example in some more detail, we in fact see three complementary uses of business process analysis and modeling:

- Architecture-based modeling associates operational processes with business motivation and strategies, capturing and driving this strategic link through process blueprints and standards, identifying processes that require change. Within the architectural framework this is positioned as enterprise planning of the Business Architecture, for more detail see also the Business Architecture and Enterprise Architecture adoption patterns above.
- Standalone Business Process (BP) Modeling can be used to understand and capture as-is processes, then via classical to-be process analysis optimize business operations without considering IT support. Within the architectural framework this is positioned as business solution delivery, often with the solution deployed simply as changes in business operational procedures.
- Modeling as part of a Business Process Management System (BPMS) augments this with additional analysis and design for the executable aspects of business processes, including the expression of Key Performance Indicators (KPI's). The purpose of the augmentation is to use these process models as the foundation for orchestrating and monitoring their automation as IT solutions. Within the architectural framework this is positioned as both business and IT solution delivery, for more detail see also the SOA-based BPM adoption pattern above.

One of the key distinctions between these three is the amount of detail and refinement that goes into the process model. Models that are intended to guide the strategic planning generally are not very detailed, rather very broadly examine the high-level interactions between different parts of the business and describe the enterprise blueprints for that interaction. Models

that merely document the current processes only have to detail out those activities that are desired to be optimized or validated for compliance (typically a small subset and with many of the details extracted from existing sources). Models that are intended to drive either new or optimized automation solutions on a BPMS platform must be substantially more detailed and formalized in order to serve as an effective source of direction in the solution implementation.

It is clear that these three types of process models should not be seen as substitutes. Furthermore, based on the distinct positioning within the architectural framework, each type of process model has distinct methods and relationships associated with it. Tools should provide effective environments tailored to the tasks, methods and vocabularies of the roles using them. Consequently for different purposes and target roles there is simply a need for different tools with different usage patterns, capabilities and integration points. IBM's purpose-based tooling support for business process analysis and modeling is visualized as follows:

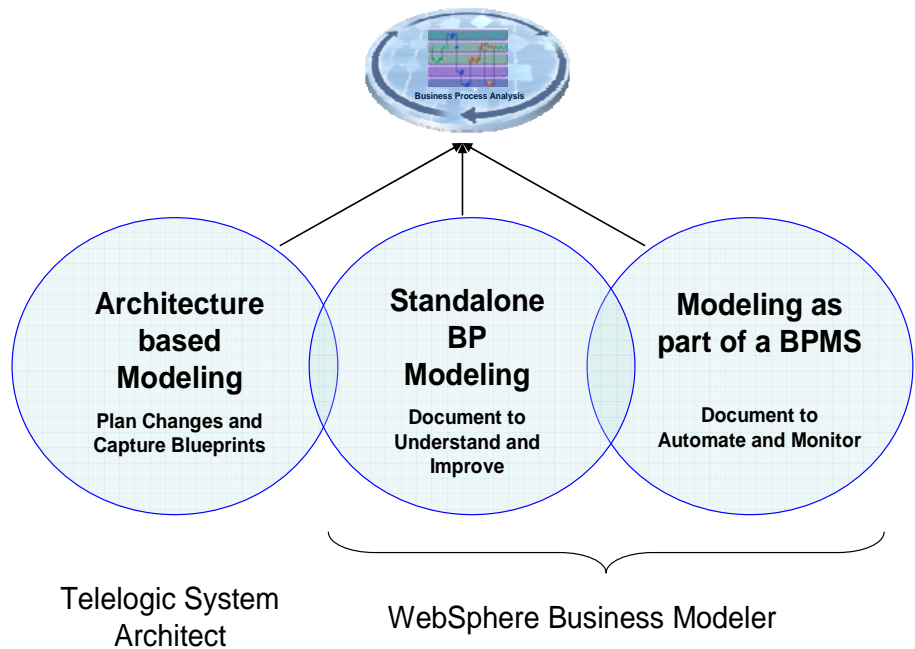


Figure 7: Role and Purpose based Tooling Support

Even though it might be possible to force the use of a single standard tool across an enterprise, such a one size fits all approach rarely produces desirable results.

A similar situation applies to other key parts of the IBM tooling platform where each tool has its purpose and part to play across the architectural framework, and seeming overlap is in fact only superficial. In brief overview:

- Telelogic System Architect is positioned for enterprise planning (with the enterprise architect and the business architect as key roles).
- WebSphere® Business Modeler (WBM) supports architecting and designing the business solution (with the business analyst as a key role, driving the solution specification and context). The remainder of the BPM tooling platform provides the IT enablement for executing business processes as well as monitoring process KPI's. All of which is part of solution delivery.
- Rational® Software Architect (RSA) supports architecting and designing the software solution (with the solution architect as a key role). The remainder of the SOA tooling platform provides the enablement for implementing and deploying the resulting services and IT components. All of which is part of solution delivery.
- Rational Data Architect (RDA) supports architecting and designing the information aspects of the solution (with the information architect as a key role). The remainder of the Information Management tooling platform provides the enablement for implementing and deploying the resulting information assets. All of which is part of solution delivery.
- Rational Asset Manager (RAM) supports consolidated and efficient sharing of approved assets across projects and roles. RAM enhances the transparency and effectiveness of the exchange of shared building blocks between enterprise planning and solution delivery.

Different tools support different roles and value propositions, yet must function together in a synergistic fashion throughout the architectural framework. IBM's tooling strategy aims at integrating different tools into a coherent collaborative environment where work products and knowledge is easily exchanged across roles and personas. This strategy provides freedom to choose the right initial adoption pattern, gaining rapid value with appropriate tooling. Importantly the strategy also enables longer-term enterprise synergies and supports the critical vitality needed for creating, maintaining and realizing a future solution architecture. Furthermore, the integrated collaborative tooling environment provides a sound foundation for metrics and KPI monitoring across the organization.

5. Conclusion

In a world of change each discipline of SOA, BPM and EA provides important value to the organization. Each discipline can be applied in isolation. Yet important as these are in isolation, using all three in a synergistic fashion provides even greater value as described above.

The principles in this paper may be applied to an entire enterprise or to part of it, and may in fact be mixed and matched as desired, assuming that a solid architectural framework exists to provide a shared foundation across those areas under consideration. The paper itself provides such a framework, and is a good conceptual starting point for a business and IT alignment initiative, also describing a set of typical adoption patterns.

To succeed in practice it is necessary to provide:

- A holistic approach shared by all involved roles, tailored to the culture and environment
- Awareness amongst key stakeholders across the organization, including a strong linkage to the Line of business
- An explicit and accepted governance model, recognizing that creating a good governance system often will require significant cultural shifts to ensure buy-in to a shared effective process of decision making
- Collaboration through good communication and a sharing of work products, based on a common language and therefore including a level of understanding and empathy for roles other than your own
- Actionable integration between enterprise planning and solution delivery across all planes of architecture

To be effective you must be specific about your objectives, think through the lifecycle principles and how to execute in your chosen architectural framework, and finally above all establish a collaborative platform supporting the critical dynamic interaction across the enterprise.

While retaining leadership and focus within each of SOA, BPM and EA, IBM's strategy supports natural evolution paths for clients pursuing a more advanced integrated approach. One of the important advantages of the IBM approach is the ability to apply a consistent change management environment across business and IT and across enterprise planning and solution delivery. The integrated IBM platform provides freedom to choose the right initial adoption pattern, gaining rapid value, yet is rich enough to carry long-term synergies as the scope and maturity of a business and IT alignment initiative expands over time.

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