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"Digital transformation starts with big visions and strategies, but the organizations that can execute upon them in a coordinated way, with agility, will win."

— Whynde Kuehn, Guest Editor

Business-Driven Digital Transformation

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Leveraging Business Architecture to Digitize Business

by William Ulrich

Digital transformation has captured the mindshare of many executives, yet establishing a business-focused vision and delivering on that vision remain challenges. Many businesses pursue technology-first solutions that often lack business transparency, a stakeholder value proposition, a link to strategic business objectives, and an overall foundation to enable business strategy deployment. Realizing business value from digital transformation requires a business-first approach.

This is not to imply that organizations have focused entirely on technology in their pursuits to digitize. However, efforts to emphasize business-driven digital transformation frequently fall back on loosely articulated concepts and operational perspectives such as detailed business processes. These efforts fall short because there is no holistic business perspective articulating what the business does and how it delivers stakeholder value. In the absence of an integrated business perspective, efforts to digitize the business tend to be inwardly focused, narrowly defined, and lacking in well-articulated business objectives.

Digital transformation requires holistic business perspectives that capitalize on shared DNA, where that DNA is represented by business capabilities, which are ubiquitously distributed across the business ecosystem.[1] Business architecture exposes the business DNA through capability mapping and — when coupled with value, information, and organization mapping — frames a comprehensive understanding of the business. In addition, capabilities provide a direct link to the IT architecture assets automating those capabilities. Collectively, this holistic business perspective delivers the foundation for digital transformation across the business ecosystem.

A business ecosystem is defined as "one or more legal entities, in whole or in part, that exist as an integrated community of individuals and assets, or aggregations thereof, interacting as a cohesive whole towards a common mission or purpose."[2] This broader ecosystem concept is particularly germane to digital transformation because organizations that focus solely on digitizing inwardly facing processes dilute the bottom-line value of these investments, leaving external stakeholders, including customers, out of the picture.

This article defines a framework for delivering a business-driven approach to digital transformation and provides an example of how articulating end-to-end stakeholder value delivery can help frame, scope, and prioritize digital transformation investments. In addition, it links digital transformation to strategic business objectives, ensuring that transformation is driven by the business. Finally, the article outlines the role of technology transformation as an extension of end-to-end strategy delivery.

Business Architecture Framework: Enabling Business-Driven Digital Transformation

Business architecture provides a holistic business perspective of a business ecosystem based on a clearly defined, time-tested framework. The business architecture framework shown in Figure 1 was adapted from *A Guide to the Business Architecture Body of Knowledge® (BIZBOK® Guide)* and represents core and extended business architecture domains.[3] Core business architecture domains include capabilities, value streams, information, and organization. The extended view of business architecture, also shown in Figure 1, includes strategies and policies that drive actions and investments, external and internal stakeholders that receive and participate in value delivery, the products and services a business delivers, the initiatives in which a business invests, and the metrics that enable business performance management.

As seen in Figure 1, these business architecture perspectives are formalized in a centrally defined knowledge base, a rich repository of cross-functional business knowledge, represented by the business architecture. A given program, planning team, executive, manager, or business analyst can selectively and systematically view this information based on the business scenario or scenarios in play. Digital transformation is one such scenario, but as with most scenarios, it does not stand alone.

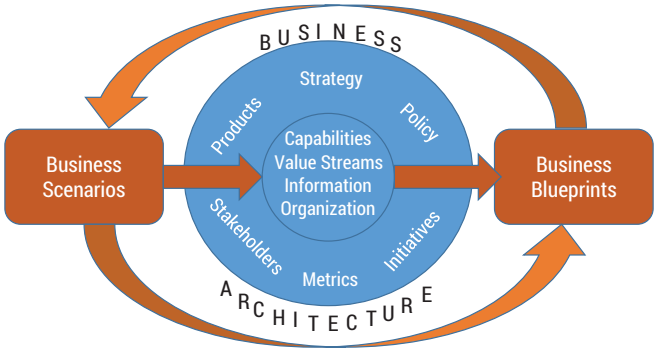


Figure 1 — The business architecture framework.

For example, one can hardly consider digital transformation in the absence of customer experience. Fortunately, business architecture is scenario-independent, which means that a centralized business knowledge base applicable to digital transformation would similarly benefit customer experience, mergers, investment analysis, and a cross-section of other scenarios. This single source of business knowledge enables digital transformation efforts to align goals, deliverables, and investments with other initiatives, ensuring that digitization concepts infiltrate a business as a whole.

Figure 2 shows the business architecture framework against the backdrop of the business operating model. It is important to differentiate between the business architecture, which is value-oriented and capability-centric, and the operating model. The operating model is defined as "an abstract representation of how an organization operates across a range of domains in order to accomplish its function."[4] The operating model is more specific as to *how* things are done, oftentimes represented by business processes and technology-oriented perspectives. The operating model can also include alternative perspectives such as event and decision models that represent how work is done.

The operating model concepts shown against the Figure 2 backdrop are not intended to represent an all-inclusive set of disciplines, but rather to identify high-profile examples found in most organizations. When formally linked to the business operating model, business architecture enables business planning and transformation regardless of operational representations and deployed technologies.

For example, business architecture provides insights into where various capabilities are automated, how well they are automated, where they are redundantly automated, and where no automation may exist at all. This is possible because capabilities define what a business does, not how it is done. Capabilities are consistent, nonredundant,

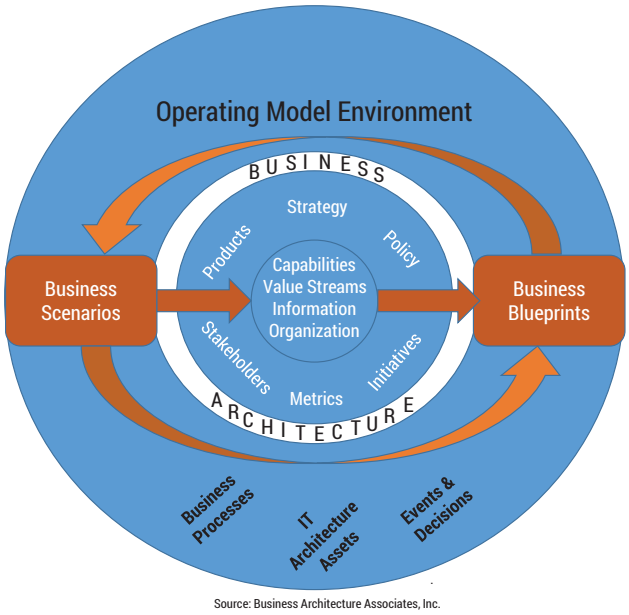


Figure 2 — Business architecture's connection to the business operating model.

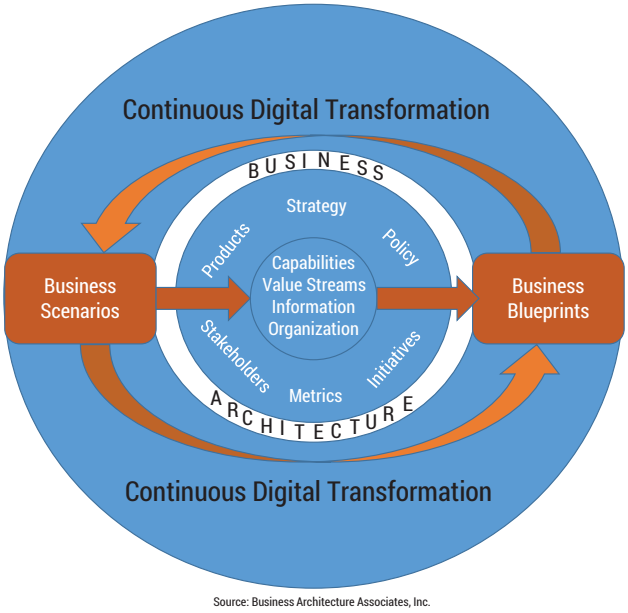


Figure 3 — The business architecture framework and continuous digital transformation.

reusable, and largely immune to changes in operational deployment approaches and technologies. If a business leverages business architecture to target a series of process improvements, the capability map can reflect these improvements through heat mapping and related metric adjustments. The capabilities themselves, however, remain constant, providing a baseline for business transformation, including pinpointing required changes to a business operating model.

Figure 3 represents a specialization of the business architecture framework against the backdrop of what may be termed "continuous digital transformation." The use of this term reflects a philosophy in which digital transformation is not simply a single initiative, but an adopted philosophy that permeates every planning effort, program, and investment. Business architecture provides the holistic foundation to ensure that digital transformation is considered for every applicable aspect of stakeholder value delivery and business capability across the business ecosystem.

The Figure 3 framework places digital transformation in a business perspective that incorporates strategy definition, through initiative delivery, framed by capabilities, value streams, information, and organization perspectives. The following discussion provides an example of how these concepts would be applied in practice, using two value streams for an airline to highlight the breadth of the ecosystem impacts and related digitization of the business.

Aligning Digital Transformation to Holistic Stakeholder Value

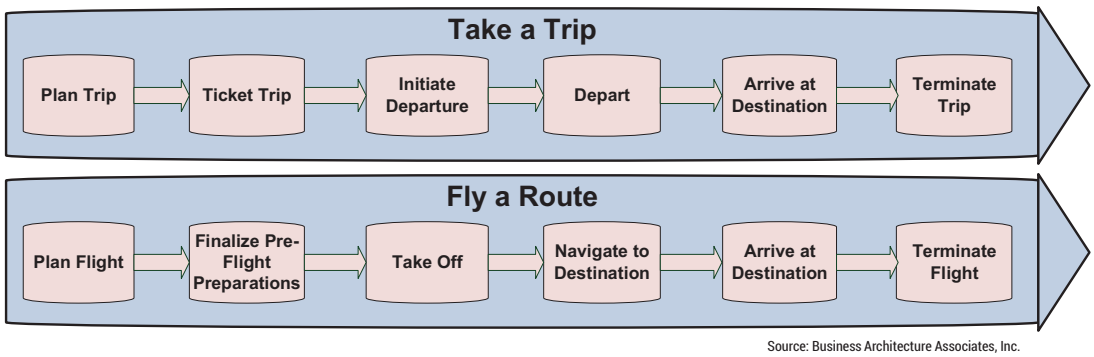
In keeping with digital transformation's principle of viewing a business holistically across a variety of contexts, viewing how a business delivers stakeholder value is a key element of this holistic perspective. Stakeholders are first and foremost customers, but they also include business partners, other third parties, *and* internal resources. The value stream provides a nontechnical, value-driven, end-to-end perspective that includes all of the enabling capabilities and participating stakeholders required to deliver the value proposition for that value stream.

Figure 4 depicts two value streams that would be commonly found in an airline. The first is a customer-triggered value stream called "Take a Trip," where a customer books a trip, makes any changes to that trip as required, takes one or more flights to an interim or final destination, and eventually terminates the trip. This value stream is based on one goal: moving the customer from the planning stage through final arrival and disposition of all trip-related activities.

Figure 4 depicts a second value stream, called "Fly a Route," which is an internally triggered value stream that transports a plane across a route. This value stream is intended to move a plane from point A to point B, with the value proposition being that the plane arrive safely at its intended destination. The Fly a Route value stream is unique and distinct from the Take a Trip value stream because it has a different value proposition, targeted at a different triggering stakeholder. Take a Trip's value proposition is to get a customer to their final destination, while Fly a Route's value proposition is to get a plane to its destination.

Figure 4 highlights several aspects of business architecture in general and value streams in particular. The first is separation of concerns. Take a Trip represents the entire customer experience from planning through trip termination. The trip may involve numerous flights, airports, and experiences leading to the final destination. Fly a Route, on the other hand, moves a plane from point to point and includes performing preflight checks, servicing, taking off, navigating to a destination, landing, and terminating the flight. These value streams are separate and independent because a given plane will leave and arrive at its destination regardless of any given customer's itinerary. The customer, on the other hand, can arrive at their destination on any given number of planes along a potentially shifting number of routes.

A value stream's value proposition, in relation to the triggering stakeholder, dictates this separation of concerns. In this example, value stream independence is based on the first value stream's value proposition differing dramatically from the second value stream's value proposition.



Source: Business Architecture Associates, Inc.

Figure 4 — Sample airline value streams.

As a side note, separation of concerns and value centricity enable business architecture to draw a clear distinction between value streams and business processes, which represent predictive, operational perspectives.

Another important concept is that value streams offer ecosystem insights that are not restricted to internal views. Figure 5 depicts the triggering stakeholder for the Take a Trip value stream, in this case the customer, along with participating stakeholders at each stage. Participating stakeholders are value enablers and include the triggering stakeholder along with a mix of internal and external stakeholders. Internal stakeholders are full-time or contracted employees. External stakeholders, on the other hand, are considered beyond the control of the airline that owns the value stream. In Figure 5, an example of an external stakeholder is airport security, which has a direct impact on the customer's experience.

This holistic stakeholder view is a core aspect of value stream articulation because external stakeholders initiate business events that impact the ability to deliver customer value. For example, a security delay may prevent a customer from making their appointed flight. In this scenario, digital transformation may seek to improve an airline's ability to notify involved stakeholders of security-related events and deliver digitized solutions to address these events. The value stream's holistic understanding and interpretation of external and internal business impacts are essential to business-driven digital transformation.

Leveraging Business Capabilities in Digital Transformation

Business capabilities, as previously stated, are a foundational business architecture domain. Capabilities play the role of anchoring business perspectives for a wide variety of transformation scenarios, including digital transformation. Coupled with value stream, organization, information, product, strategy, and initiative mapping, capabilities provide a central focal point for exposing multidimensional aspects of a business ecosystem.

One area where capabilities play a major role in business transformation is in defining clarity around business objects and related events. Capabilities are based on business objects, and events trigger state changes to those objects, invoke certain business rules, and ensure that stakeholders are engaged at appropriate points along the value stream. Collectively, these events and object transitions move a value stream toward ultimately achieving the overall value proposition.

One area where capabilities play a major role in business transformation is in defining clarity around business objects and related events.

For example, Figure 6 depicts how a common business object — the plane — is engaged across both value streams. The role of the plane in Fly a Route is obvious because getting that plane to its ultimate destination is the value proposition for that value stream. The role of the plane in the Take a Trip value stream is also essential as the mode of transport to get the passenger to their final destination. Getting a customer to their final destination, however, does not rely on any given plane. It simply requires that the customer get matched up to a plane or planes that ultimately get them to their destination.

Leveraging business architecture's separation of concerns and capability-centric approach decouples and simplifies complex business perspectives and challenges, enabling formalization and streamlining of digital transformation efforts. In the Take a Trip value stream, this means that there would be a series of capabilities that would match a customer with a plane,

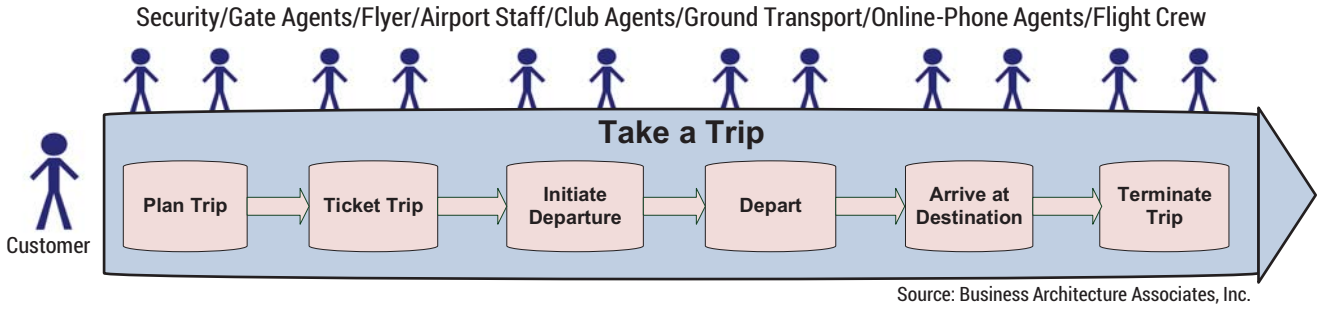


Figure 5 — The Take a Trip value stream and its triggering and participating stakeholders.

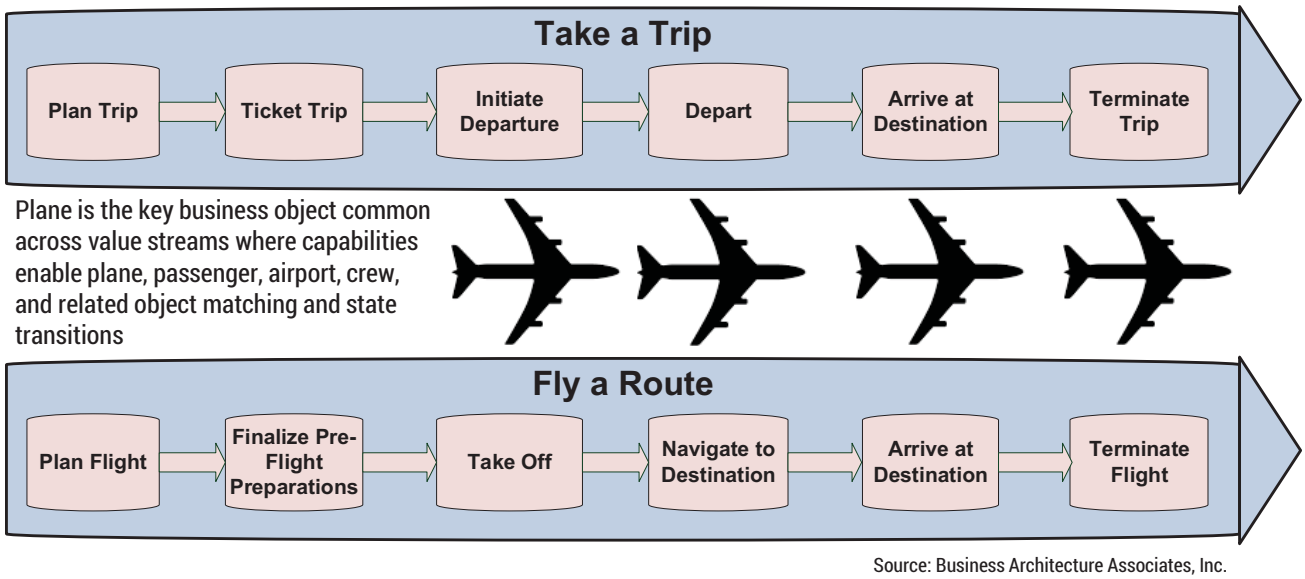


Figure 6 — Sample value streams with shared business objects.

airport, route, luggage, and related services. "Matching" capabilities are used to ensure that all relevant business associations are established as required in the context of a value stream.

A combination of capabilities, drawn from a centralized capability map, establishes the basis for value enablement. Consider the Take a Trip value stream shown in Figure 7. This example highlights six sets of capabilities, each of which enables a corresponding value stream stage. For example, the first stage in the Take a Trip value stream involves planning the trip. Capabilities enabling this stage might be called Submission Facilitation, Route Definition, Search Management, Map Management, Route/Airport Matching, Flight Identification, and Trip Definition. Capabilities enabling the second stage might include Itinerary Definition, Itinerary Pricing, Itinerary Contract Finalization, Itinerary/Payment Matching, and Trip/Itinerary Matching.

Deriving the aforementioned capabilities is a direct result of understanding the business objects that define the essence of a business. One prior example of a business object was the plane. Additional business objects that serve as a basis for deriving the aforementioned capabilities include customer, trip, itinerary, route, map, airport, plane, stakeholder, departure gate, search (the noun, not the verb), and payment. Following this object derivation approach means that a business can articulate robust capabilities that enable event definition, decision management, state management, work routing, information management, and other capabilities to deliver end-to-end stakeholder value.

For example, a plane matched to an airport and a departure gate would be reflected in object state analysis and object-to-object matching. This means that the customer arrives at their gate in the time required to satisfy their itinerary or the customer is matched to an alternative gate, time, plane, or even another airport. Note that up

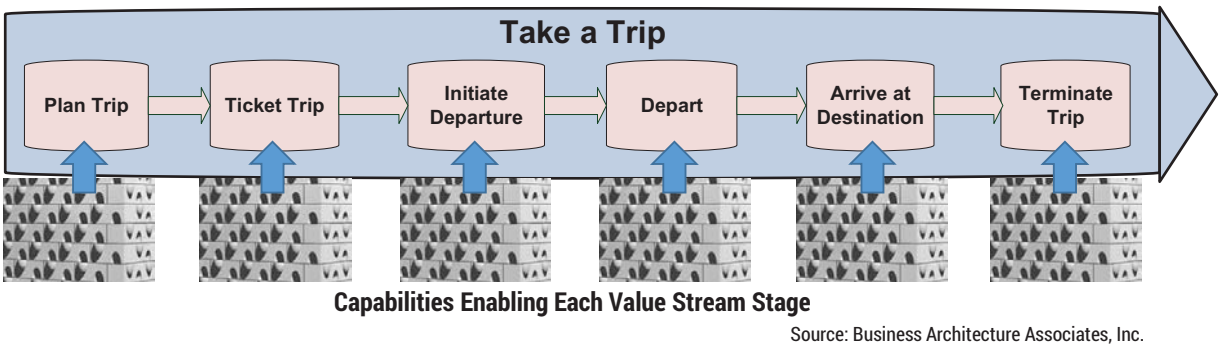


Figure 7 — Capability-enabled airline value stream.

until this point, the business architecture discussion has not engaged in any degree of IT-related concepts, yet business architecture establishes a robust foundation for driving IT architecture and digital transformation.

Linking Business Architecture, IT Architecture, and Digital Transformation

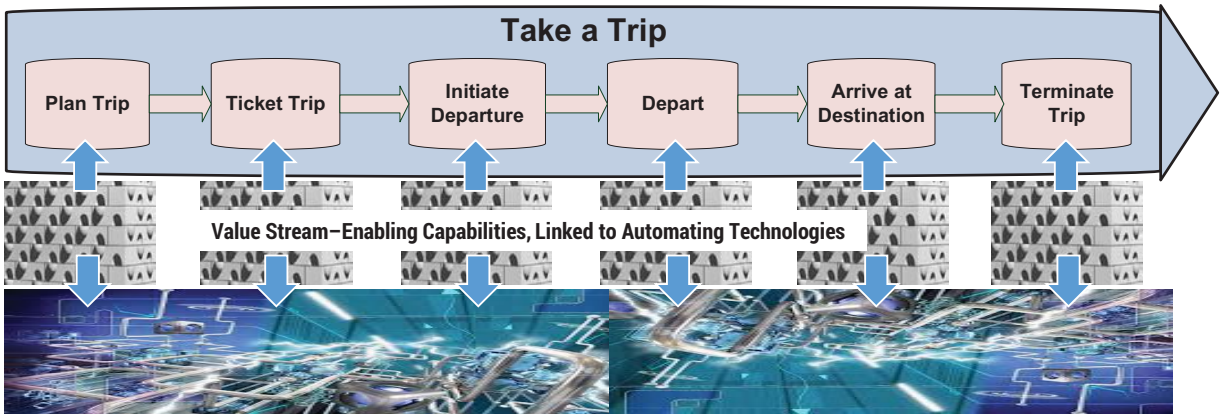
Capabilities are the main link between business architecture and IT architecture in general, and digital transformation in particular. Not all capabilities can be automated, but as a rule, the greater the level of capability automation, the greater the degree of efficiency, effectiveness, and digitization. Capabilities may be automated in any number of ways. Historically, capabilities have been automated through complex legacy software systems. These legacy systems are often redundant, highly coupled, poorly articulated, and difficult to leverage outside of a given implementation context. This situation, which is common in most larger enterprises, undercuts digital transformation goals because legacy systems were never intended to deliver the degree of anytime/anywhere automation envisioned by many businesses today. Where this has occurred, back-end legacy systems become more of an anchor than an enabling technology.

A more recent shift to well-defined software services, built within a service-oriented architecture (SOA), provides a greater degree of platform autonomy, predictability, and reuse, establishing building blocks for future solutions. Services have a great deal in common with capabilities, being object-based, single-purpose, reusable, and autonomous. While SOA will continue to be a desirable concept, business architecture does not dictate technical solutions, and digital transformation should leverage leading-edge solutions as appropriate to the business value being sought. The value of business architecture is that it provides the foundation for assessing existing technologies from a business perspective, determining gaps and weaknesses, and establishing a digital transformation roadmap.

Capabilities are the main link between business architecture and IT architecture in general, and digital transformation in particular.

Figure 8 depicts the Take a Trip value stream along with enabling capabilities linked to the technologies that automate those capabilities. While capabilities are designed to be consistent and reusable across multiple value streams, value streams provide context in terms of investing in and benefitting from improvements to those capabilities. If an organization is seeking to digitally transform the end-to-end customer trip, business architecture allows executives to focus strategic plans, investment analysis, roadmap definition, and coordinated business/IT solutions on high-priority value-oriented touchpoints.

Consider the Take a Trip example in Figure 8. Most mobile device–enabled airline applications allow you to get real-time updates on flight status, gate changes, and other information. When a customer misses their boarding window, the airline relies on the airport public address system to get that customer to the gate. If capabilities were automated to match a final boarding message to a customer, then a message would appear on the customer's personal device indicating that they have five minutes to get to the gate and board. Under this approach, everyone engaged in planning through deployment can visualize and articulate digitization



Source: Business Architecture Associates, Inc.

Figure 8 — Business architecture mapping to IT architecture.

benefits, which include personally notifying the customer so they can make their flight while in turn preventing planes from departing with empty seats and reducing passenger rebooking costs.

Capability-driven IT investment planning ensures that legacy systems enable — or, minimally, do not constrain — efforts to deploy digital transformation.

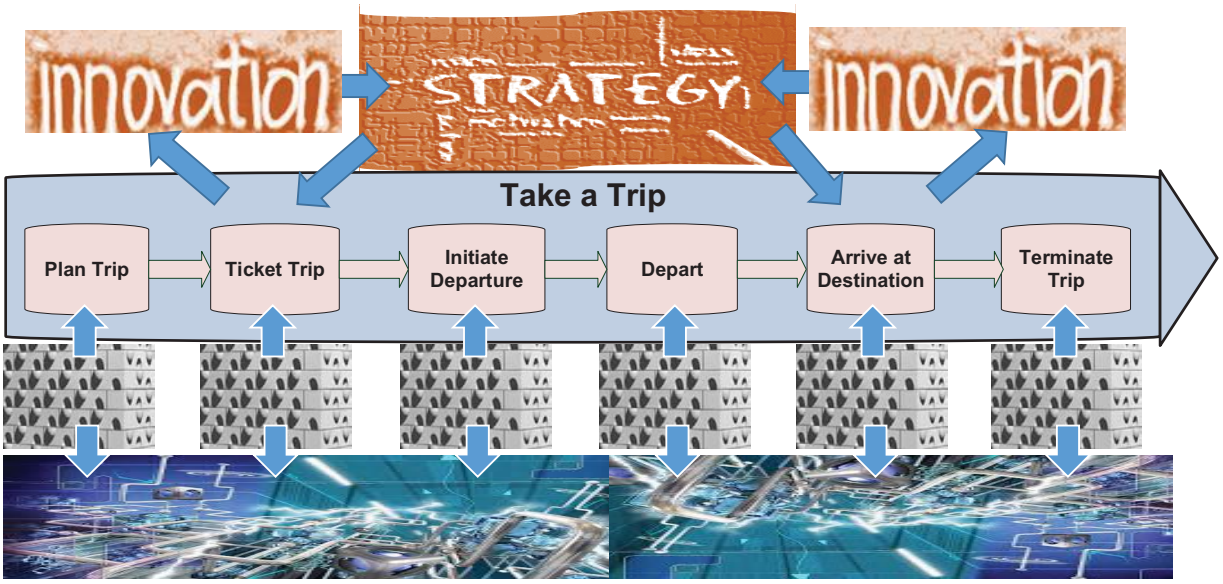
While capabilities provide an essential window into technology limitations, redundancies, and gaps, value streams provide context to capability-based IT investments. Pursuing IT architecture investments without a value-focused, capability-centric context results in ill-advised, resource-wasting investments. It is therefore essential that business-driven digital transformation leverage business architecture, which includes not just capabilities and value streams, but information, organization, and other business perspectives.

Legacy systems transformation will ultimately be an element of digital transformation efforts for most large enterprises with a substantial investment in legacy systems. Business architecture frames the context for legacy transformation, reuse, retirement, and related activities and plays a key role in highlighting roadblocks to digital transformation linked to legacy software architectures. This is possible because capabilities enable the laser-like focus needed to surgically dissect and transform legacy systems as required to achieve digitization goals. Capability-driven IT investment planning ensures that legacy systems enable — or, minimally, do not constrain — efforts to deploy digital transformation.

Leveraging Business Architecture to Realize Digital Transformation Strategies

One of the challenges facing businesses is that of setting business strategies and providing traceability of those strategies back to clearly articulated business perspectives and underlying technologies. Too many technology investments end up having little or no traceability back to a defined business strategy, and those investments should be questioned, if not terminated. Business architecture provides a means to ensure that when a strategy is set, there is absolute clarity and traceability from strategic objectives to stakeholder value and enabling capabilities.

Figure 9 highlights the relationships across innovation, strategy, value streams, capabilities, and IT architecture. Innovation — focused on new, out-of-the-box ideas, concepts, and products — is influenced by the strength of differentiating capabilities and how they enable the delivery of customer and related stakeholder value. For example, if an airline's strength is delivering up-to-the-second information about flights, then enabling capabilities could be further digitized in new and unique ways.



Source: Business Architecture Associates, Inc.

Figure 9 — Driving strategy through business architecture to deliver digital transformation.

Innovation, in turn, helps influence and shape strategy. Based on the link between capabilities and IT architecture, digital transformation efforts can make more informed decisions about technology investments resulting from the ability to trace each capability to current or planned automations. In addition, having up-front clarity on stakeholder, value stream, capability, information, and technology impacts is a game changer that enables executives to make highly informed decisions with a clear understanding of the costs, level of effort involved, and value to be derived.

Conclusion

Business-driven digital transformation requires a holistic view of the business, from its core DNA, through how it delivers business value, to the information it uses. Business architecture delivers this perspective and enables an organization to drive changes to a business's operating model, ultimately enabling digital transformation. Unlike operational perspectives, which get embroiled in how things are done, business architecture views the business as a whole to provide the broadest coverage needed to plan and deploy digital transformation. Business architecture's separation of concerns, link to stakeholder value, and capability-centric approach open up an entirely new frame of reference for organizations seeking any variety of transformational investments.

Endnotes

[1]"Digital Transformation: Online Guide to Digital Business Transformation." i-SCOOP, 2016 (http://www.i-scoop.eu/digital-transformation/).

[2]"Appendix A: Glossary." In *BIZBOK® Guide v5.0*. Business Architecture Guild, 2016 (http://c.ymcdn.com/sites/www.businessarchitectureguild.org/resource/resmgr/BIZBOK_5_0/BIZBOK_5.0_Glossary.pdf).

[3]"Part 1: Introduction." In *BIZBOK® Guide v5.0*. Business Architecture Guild, 2016 (http://c.ymcdn.com/sites/www.businessarchitectureguild.org/resource/resmgr/BIZBOK_5_0/BIZBOK5Part1.pdf).

[4]de Vries, Marne, et al. "A Method for Identifying Process Reuse Opportunities to Enhance the Operating Model." *Proceedings of the 2011 IEEE International Conference on Industrial Engineering and Engineering Management*. IEEE, 2011 (https://goo.gl/H99lE6).

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