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Management, Innovation, Transformation

"'Digital disruption' is a phrase that is commonplace in discussions about IT strategies. What are its characteristics, and how should organizations respond to it?"

— Roger Evernden, Guest Editor

Leveraging Enterprise Architecture for Digital Disruption

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Opening Statement

by Roger Evernden, Guest Editor

"Digital disruption" is a phrase that is commonplace in discussions about IT strategies. Like many buzzwords, it has generated a great deal of discussion and debate. It is real or imagined? Does it signal a major transformation to our business models, or is it pure hype? What are its characteristics, and how should organizations respond to it?

When I wrote the call for papers for this edition of *Cutter Business Technology Journal* (*CBTJ*), I was curious to examine how enterprise architecture (EA) can be leveraged to address the disruption organizations are facing today. In particular, I wanted to encourage authors to look at extreme shifts in business and operating models and provide advice on how EA should respond.

My intuition says that the potential for disruption from digital technologies is far greater than the changes we have seen so far. For many years, management consultants, business gurus, and IT experts have tried to explain the economic and social changes of the Information Age. With the growing application of digital business models, though, these explanations may have been too conservative.

Today we are considering how established business models should respond to digital disruption. But the digital disruptors of today — Amazon, Netflix, Uber, and other frequently cited examples of digital transformation — are still operating with business models that focus on growth, market share, profitability, price mechanisms, the sovereignty of the consumer, and the freedom of the enterprise. What happens when digital disruption attacks the conceptual foundations of our current economic, political, and social architectures?

In the call for papers I asked: What is the correlation between the business or operating model and the enterprise architecture? What are the pros and cons of the various enterprise patterns that are a response to these changes?

The authors in this issue offer practical answers, ideas, and advice to help you and your EA practice respond to the immediate digital challenge. However, enterprise architecture should also consider the larger future. As you read through these articles, I urge you to ponder more profound possibilities:

- What can EA do to leverage common social knowledge embedded in the Internet?
- What EA patterns support economic models in which many products or services are available through the Internet free of charge, or at a very low price?
- Do we need to consider a radically different approach to EA to accommodate an info-capitalist, cognitive capitalist, or postcapitalist world?

What happens when digital disruption attacks the conceptual foundations of our current economic, political, and social architectures?

In This Issue

In our first article, Jan-Paul Fillié, Karel Auwerda, and Jan-Willem Sieben discuss how EA can be used to counter disruption. The authors point out that the ease of obtaining, copying, and implementing digital assets means that there is potential for rapid changes in nearly all disruptive business models. This ability to change rapidly is reflected in the enterprise architecture itself, which tends to be relatively simple, modular, and responsive.

Many digital disruptors are newcomers — a theme that is taken up in a later article that explores the use of EA by startups. Fillié and his coauthors note that, in comparison with existing architectures, these new business models are both different and simpler, and the use of new technology and digitization is a key success factor. Because of this, EA must be used to either help transform traditional businesses to deal with disruptors or create new spinoff capabilities to directly confront them.

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An enterprise architecture that closely aligns with a traditional business model cannot adapt easily to digital disruption. As enterprise architects attempt to respond to digital disruption, they must choose whether to adopt the same tactics as the disruptors or follow a different course. To help you decide on your EA response, the authors present a simple three-stage approach. First, they examine the disruptors' business models and options for countering them; then they show how you can gauge your EA's counter-strategy ability; and finally they present three generic EA patterns that can help you transform your EA from a handicap to an advantage.

Next up, Seema Jain and Vipin Jain tell us how organizations can leverage EA for digital business and IT transformation. A common theme in this issue's articles is the feeling that we are facing a big change. Jain and Jain label this change a "revolution" and list some of its key digital enablers:

> We are at the dawn of another big revolution: the "digital revolution," characterized by the sharing economy, digital platforms, ubiquitous Internet,customer experience, mobility, cloud, Internet of Things (IoT), data analytics, machine learning, artificial intelligence (AI), robotics and automation, and more.

Of course, it is never technology alone that makes a difference: two other necessary ingredients are an innovative business model and a supportive enterprise architecture. The authors argue that EA is a valuable discipline for any enterprise responding to new types of competition or new opportunities. They also point out that such demands are constantly evolving, so your EA must enable you to adapt and respond quickly and efficiently.

Jain and Jain remind us that digital business and IT transformation is a far-reaching and complex undertaking:

> The starting point can vary, but in general it involves adoption of disruptive technologies and emerging business models, which in turn demands changes to organizational structure and business capabilities and processes.

In other words, an effective response has broad consequences across the enterprise architecture — that is, across the organization, both business and IT.

The authors note that while industries and enterprises vary in their understanding of and response to the digital revolution, there are common recommendations and important advice that pertain to any EA practice. They list benefits and objectives that apply to all EA efforts, as well as guiding principles that are vital when addressing digital disruption. For starters, EA should provide a thorough understanding of current and desired capabilities and the EA components required to deliver them. From my experience as an enterprise architect, I wholeheartedly agree with the authors that, when dealing with digital transformation, "having an effective EA group is now more valuable ... than ever before."

The third article is my own contribution, in which I ask whether we can truly architect our digital futures. In writing the article, I wanted to examine the much longer-term implications and consequences of the information and digital revolutions. I was driven by a realization that the way in which people as a species organize and manage their lives on planet Earth is changing, and that this transformation has the potential to introduce a true paradigm shift in the things we consider "enterprises."

I start by showing that we are no longer working exclusively within the boundaries of a traditional enterprise. My second observation is that a vital aspect of digital disruption is the possibility of making almost anything smarter by adding functionality and data. These two developments are transformational on their own, but the digital revolution is also making a colossal change to the way in which we produce value and how we manage that value. It is also contributing to a major shift in power — from nations to organizations and regions. In parallel, information, social media, and digital technologies are giving more and more power to the masses. I support these claims by drawing on the views and research of some of the leading minds of our time. Finally, I discuss the implications and

UPCOMING TOPICS

Charalampos Patrikakis and José Barbosa
The Industrial Internet: Driving Digital Transformation

Don McIntyre
Agile Leadership: Foundation for Organizational Agility

Steve Andriole
Insurtech: Reinventing the Insurance Industry

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options for EA. The key conclusion is that action is always better than inaction.

We close the issue with an article on EA in startups by Kaine Ugwu. Many digital disruptors are startups, and his article suggests ways that they can develop an organizational culture that supports their unique organizational architecture capabilities and strategy.

Ugwu points out that when startups are founded, they often focus on their business strategies without necessarily thinking about sustainability. Although it may not be explicitly described, startups do have an architectural structure. The same might be said for many enterprises that have no formal architectural descriptions and no architectural governance in place.

He writes that as companies and their external environment develop, they become more complex, and the architectures that worked in the past may become barriers. As Amazon has done through its kaizen program, organizations need to find ways to remain efficient, flexible, and innovative in order to achieve a sustainable competitive advantage.

Ugwu explains that by exploring an organization's shared values, architectural artifacts, and assumptions, we can understand the enterprise culture and foster a supportive and sustainable EA. To do this, we need to consider not just the formal, tangible elements like structure and information, but also the intangible building blocks that represent the culture, such as norms, commitments, shared passion, and values. He concludes that we must architect with these things in mind, tailoring frameworks so as to develop our own unique EA.

Conclusion

Producing this issue of *CBTJ* has yielded many interesting insights on disruption and EA. As our first article points out, disruptors often come up with their business models through trial and error — and in practice, serendipity is a significant factor in the development of any enterprise architecture!

At the same time, innovative digital startups often have cultures that are radically different from traditional companies. As Fillié et al. note, they are extremely customer-focused, have a nose for talent, are well versed in Agile practices, exploit the latest technologies and platforms, and "avoid big investments by sharing, renting, partnering, and building relationships." Any organization addressing the challenge of digital disruption must consider these soft, intangible factors as much as the more obvious component design areas in EA if they wish to overcome barriers such as a talent deficit or a lack of leadership and organizational agility.

Our contributors agree that while there is no single "right" response to digital disruption, there are some important commonalities at the architectural level. Fillié and his coauthors write that digital EA can be characterized by "lean, highly optimized and automated processes ... [that] disintermediate as much of the value chain as possible and directly access the end customer." Jain and Jain argue that because "digital businesses are more integrated and automated than traditional businesses, they must be more explicitly designed." The enterprise architecture and its architects play a vital role in managing this increased integration and automation while delivering business value.

Finally, it is clear that the digital revolution is not over yet. We are only in the first stages. No more can we limit our architecting within the confined borders of an "enterprise" — we have to consider the wider social, economic, political, environmental, and technical contexts. We can no longer expect to be "in control" of the evolution of the architecture (if we ever were!) — we must allow for emergence, serendipity, and disruption, and must therefore design architectures that are flexible, sustainable, and responsive. And in the longer term, we must anticipate that our current business models are predicated on ideologies that are unsustainable and consider future enterprise architectures that are more ecological, egalitarian, balanced, organic, and viable.

Roger Evernden is a Senior Consultant with Cutter Consortium's Business & Enterprise Architecture practice. He has been an enterprise architect since 1984, specializing in the highly practical use of EA to manage organizational transformation. Mr. Evernden acts as advisor, mentor, and coach on EA initiatives, leads training workshops, and writes regularly about strategy and architecture. He provides a unique combination of training and tools to help architects and their teams throughout an EA program and at each capability level. Mr. Evernden's hands-on training workshops provide a thorough grounding in all key techniques, with practical examples, exercises, and demonstrations.

As architect of the Information FrameWork (IFW), Mr. Evernden pioneered many contemporary techniques, including the use of industry reference models, business capability analysis, and component-based building blocks. His work has been the basis for more than 400 business and IT architecture initiatives worldwide. Past clients include Alcatel-Lucent, Allied Irish Banks, AstraZeneca, Bancomer, Bank Austria, Barclays, Credit Suisse, DnB NOR, HSBC, IBM, ING, Lombard, Lloyds Banking Group, Microsoft, National Australia Bank, and Westpac. Mr. Evernden has written articles appearing in major publications and books, including the seminal article on IFW in IBM Systems Journal*. He is the author of two books about EA:* Enterprise Architecture — The Eight Fundamental Factors *and* 101 Lessons from Enterprise Architecture*. He can be reached at revernden@cutter.com.*

Countering Disruption: How EA Can Support Disruptive Business Models

by Jan-Paul Fillié, Karel Auwerda, and Jan-Willem Sieben

In today's business environment, changes occur daily. While incumbent businesses are grappling with their legacy systems/infrastructure, new players like Uber (transport) and Airbnb (hospitality) enter the market with industry-changing services. The new businesses operate with business models that are not only different and changeable, but in most cases are also significantly simpler than the existing ones, cutting out parts of the value chain. In a majority of cases, the use of new technology and digitization is a significant factor in why these newcomers are so successful. Established firms struggle to adapt their business and IT to cope with these changes, but they are either failing completely or feeling a major impact on market share, revenues, and profits.

In this article, we investigate ways to use enterprise architecture (EA) to deal with disruptive business models, either by supporting the transformation of your own business to deal with disruptors or starting new spin-off businesses that attack the disruptors head on. How can a company use its existing EA to address the challenges in disruptive business models? After all, an EA that is well aligned with your current business model is probably ill suited to responding to disruptors. So here we take a closer look at the disruptors' business models and discuss how they can be countered. We also consider how you can assess your present EA's ability to cope with the demands of this counter-strategy. Finally, we present three generically applicable scenarios that may change your EA from a liability into a competitive advantage.

Business Change Acceleration and Disruptions: Challenges and Opportunities

Disruptive business models appear quickly and look to be successful. These business models are leveraging the ongoing digitization of our society, the pervasiveness of mobile devices, and the "savviness" of the new consumer with regard to these new channels and technology. Disruptors disrupt in a way that totally changes the marketplace rules and current competitive arena. Also, because of the high portion of digitization involved, such businesses are often easy to start — barriers to entry are low. When Uber started making it possible for passengers to order a ride by using an app on a mobile phone, no one suspected that this would soon change the world of transportation. Regular taxi companies were slow to respond because they could not imagine that passengers would choose to be transported through the city by random vehicle owners who wanted to make some extra money.

Something similar happened when Booking.com changed the game by allowing property owners to set their own rates and room allocations and collect their own payment instead of having to cede all transaction handling to the booking site, as with other travel sites. Another important element was that the hotels could immediately see where they were listed in the search results. This model allowed Booking.com to ask only 12% commission, which was less than half that of the other travel operators.

There are a number of disruptive business models around, such as those described in *The Lean Startup*[1] by Eric Ries and in *Digital Transformation*[2] by Jo Caudron and Dado van Peteghem. These models disrupt with their methods of obtaining customer share and loyalty, value chain transformations, delivery models, and alternate cash flows. The past few years have seen several disruptors grab huge market share and, in some cases, become market leaders in their industry — Amazon being the textbook example of a former disruptor of the book- and media-selling industry, using then-revolutionary technology (i.e., Internet and e-commerce).

As described by Edward Giesen and his IBM Global Business Services colleagues,[3] there are three general strategies for business model innovation:

1. **Industry model innovation** — by improving the industry value chain or even redefining an established industry.

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2. **Revenue model innovation** — by reconfiguring offerings and/or by introducing new pricing models. This usually starts with improving customer experience and leveraging new technologies.
3. **Enterprise model innovation** — by changing the structure of the enterprise and the role it plays in new or existing value chains and redefining organizational boundaries.

These business model innovations are the basis for developing counter-strategies to disruptors.

Incumbent organizations can choose from seven generic counter-strategies, as described by Michael Wade of the International Institute for Management Development (IMD).[4] Choosing a counter-strategy is both difficult and necessary. Depending on the success of the disruptor's model, it may pose an existential threat to your organization. The seven counter-strategies are likely to be used in conjunction and can be grouped into three categories:

1. **Blocking strategies** fight disruptors with all means available (regulatory, copyright, legal, political, etc.). An example is the present legal and regulatory barriers imposed on Uber in several countries. Another famous example is the recorded music industry, which fought vigorously to prevent Internet download business models from being successful in the early 2000s.
2. **Go-along strategies** entail fast alignment of your business model with that of the disruptor and competing head-to-head. This is possible as a spin-off model, coexisting or even competing with your current portfolio/model, or as a new core strategy for the whole organization. A good example is the response of traditional airlines to the emerging low-cost carriers, especially in Europe. The incumbent airlines sometimes launch, acquire, or remodel subsidiary airlines to compete with these newcomers.
3. **Exit strategies** work either by "milking" the current value chain as much as possible before exiting the market or by seeking adjacent or niche marketplaces. An example of this strategy is the turnaround of newspapers that, slowly but surely, leave the print business in favor of various Internet business models.

Is Your EA Suiting You Well?

Whatever choice your organization makes to counter the disruption threat, the next step is to execute on the chosen strategy. In other words, the company must invest in its capability to counter — in most cases by investing in existing or new digital and IT assets, besides other measures in marketing, finance, or operations. Digital assets have the advantage of being easy to copy, obtain, and implement and thus to allow rapid changes in almost all disruptive business models. For nearly all counter-strategies, a company must look at its digital assets in relation to each other and to the present digital landscape — that is, the enterprise architecture. Except for the blocking strategies (which have other requirements), we first look at the current support for the existing business model derived from the enterprise architecture. We can then assess a company's readiness for the counter-strategies from the EA perspective. To do so, we must take a closer look at the EA you have in place.

Whatever choice your organization makes to counter the disruption threat, the next step is to execute on the chosen strategy.

By definition, an enterprise architecture consists of a business model architecture (with processes and functions), an information architecture, and an IT system architecture, combined with the principles that guide the development of these architectures (e.g., TOGAF). So how do we assess the alignment of that architecture with the business model being used in the company? How well is the EA supporting the current business model? Are there deficiencies?

In *Enterprise Architecture As Strategy*, Jeanne Ross and her coauthors[5] argue that an EA is at its optimum when:

- Alignment of the business model and IT is smooth, from both a technical and a governance standpoint. Return on investment for IT is high, and technical debt (legacy systems) is low.
- Future developments of your IT are predictable, planned for, and flexible enough to be adjusted if business events occur. IT is considered an asset for change, not a liability.

The existing EA can be measured against a maturity model.[6] When you are aware of the current state of your enterprise architecture (mature vs. immature), it is possible to assess its ability to support the chosen counter-strategies. But even if you have an optimal, high-maturity EA, it might pose difficulties in responding to a real disruptive change. For example, a very mature and well-aligned EA for a supermarket company is not really suitable as an EA for e-commerce, since the first is geared toward operational excellence in

When Serendipity Strikes

John Deere

John Deere is a well-known American producer of tractors and other agricultural and forestry machinery. To optimize preventative maintenance, the company decided to invest in implementing sensor equipment in all their machines. They soon realized that besides collecting data on the equipment's maintenance status, they could collect data on environmental conditions. Based on the collected input, John Deere can help farmers optimize production in all steps from seeding to harvesting.

Through a portal provided by the company, clients are given planting and harvesting advice based on aggregated data from users all around the world combined with external input such as weather and financial data. In this way, John Deere has become the world's largest agricultural consultancy firm.

Slack

Stewart Butterfield was one of the cofounders of Flickr, a photo-sharing community supported by an app. Then he went into game development and released a massive multiplayer online game, but he had to shut it down a year later due to limited sales. However, the remaining team members turned back to Flickr to see what they could turn into a product. They ended up transforming their self-built communications tool into a collaborative, customizable team communications platform: Slack. Now they have millions of active users.

distribution logistics from suppliers to brick-and-mortar supermarkets, whilst the latter must be geared toward customer intimacy, ease of use, and last-mile optimum logistics.

Disruptors and IT: How Do They Do It?

So what are disruptors doing, what are their business models, and how do they employ IT? Do they purposefully use (enterprise) architecture to succeed? And should you, foreseeing disruption, follow the same tactics, or are you in a better position to follow different courses?

Although this is not the place to discuss business models in much detail, it pays to consider how disruptors arrive at their business models: quite often by chance and through trial and error! Serendipity plays a role — by doing (or trying to do) one thing, they arrive at another (see sidebar "When Serendipity Strikes."). If the new model is successful, disruptors do not attempt to immediately make it as profitable as they can. Instead, they reinvest to make it grow and aim at increasing their market share.

What else are disruptors doing that we can learn from and shape the EA toward? First and foremost, they are extremely customer-focused. Customer experience and intimacy are the most important success criteria, so they are continuously looking for ways to get to know their customers better, increase their responsiveness, and base company direction on input from their customers. All this is to gain market share from the incumbent market players.

Second, they are constantly on the lookout for talented people to employ and involve. Digital innovators are fluent in Agile, and they employ analytics and cognitive technologies as well as the latest trends in mobile and social platforms. They "lure" talent from incumbents in the marketplace.

Finally, they avoid big investments by sharing, renting, partnering, and building relationships.

An important aspect, also for the EA, is disruptors' focus on lean, highly optimized and automated business processes. The point is to disintermediate as much of the value chain as possible and directly access the end customer.

EA Patterns for the Incumbent

With all this in mind, it is good to take a closer look at possible EA strategies or "patterns" you can adopt as an incumbent company. Regard them as high-level blueprints for the IT landscape of your new business strategy. Starting from your present EA (mature or not), and having analyzed the ways and means of the disruptors' success, you have a choice of three generic EA patterns.

EA Pattern 1: The "Lego" EA

This pattern aims at reusing your current modular IT landscape, easily remodeled to support new business models. As shown in Figure 1, it is based on an existing EA that is built around flexible "modules" or patterns,

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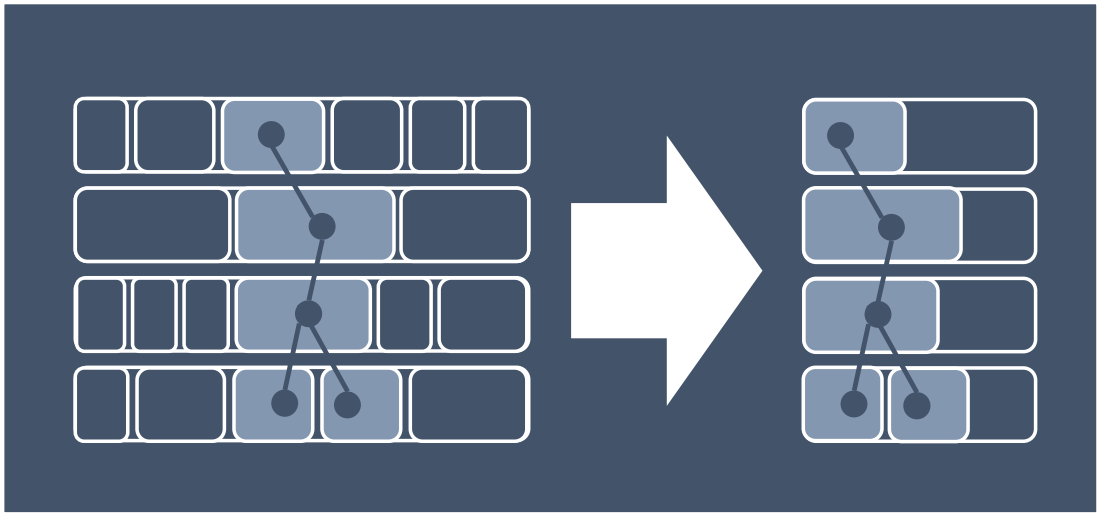

Note: The above modular enterprise architecture consists of the TOGAF layers Business Architecture, Data Architecture, Solution and Application Architecture, and Technology Architecture.

Figure 1 — The Lego pattern.

consisting of processes, data, and/or technology (i.e., applications, datasets, infrastructure). It offers an organization the ability to redeploy these modules (e.g., product lifecycle management module, risk assessment module, customer onboarding modules) in the new disruptive counter-strategies. It foremost supports go-along or exit strategies such that it is easy to introduce new - products/services with the extant modules.

This pattern typically suits product- or project-oriented business models (e.g., product leaders in manufacturing, electronics, and financial services companies). Typically, these module-based EAs are a result of high investment in IT and high EA maturity as a result. Consequently, these companies can respond to disruptors relatively quickly and cheaply, since the modular, Lego-style EA allows for easy reassembling of modules in a different fashion — suiting the disruptor's EA pattern. Table 1 shows the characteristics and applicability of the Lego pattern.

An example of the Lego pattern is seen in the newspaper business in the Netherlands, where in 2005 a legacy newspaper company reused many of their EA modular assets (e.g., subscription information, reader profiles, editorial archives, electronic channels) to launch a 24-hour news website that formed the core of their go-along counter-strategy. This allowed them to compete well with the then-disruptive freelance journalist community that was using the Internet to publish news and background stories for free.

EA Pattern 2: The "Copycat" EA

This pattern identifies EA capabilities/patterns found in a disruptor and reuses your own assets to start building an EA fit for purpose. It differs from the previous Lego pattern in that it looks very closely at the disruptor's EA and tries to copy that instead of relying on existing modules in the current EA; this pattern is outside-in

Lego Pattern	
Current business strategy	Mainly product leaders; innovation-oriented and project-based companies
Current EA maturity	High
Counter-strategy	Go-along or exit
Level of disruption	Intermediate
Implementation effort (time and cost)	Low

Table 1 — Characteristics and applicability of the Lego pattern.

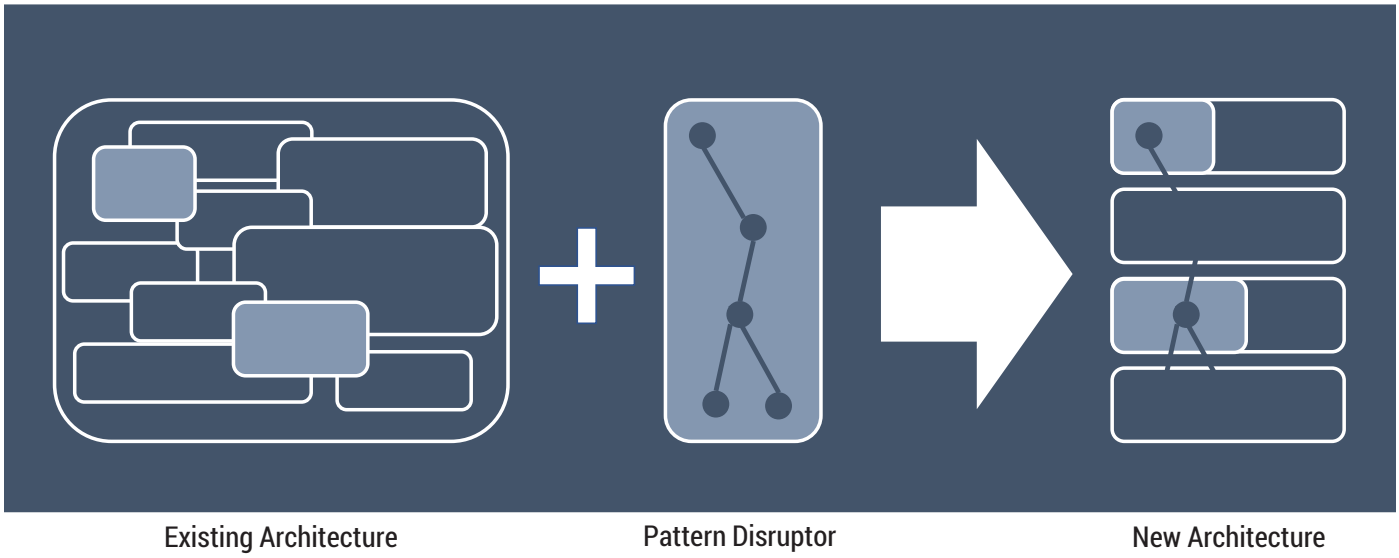

Figure 2 — The copycat pattern.

focused, whilst the Lego pattern is inside-out focused (see Figure 2).

In the copycat pattern, you look very closely at the (inherent) EA of the disruptor and use your "equivalents" of that EA within your own EA to expedite a go-along strategy; alternatively, you can buy a disruptor and integrate their capabilities into your EA. This pattern is more suitable for EAs that are not set up in modular fashion, as a result of a different current strategic business model (customer-centric or operational excellence). In many cases, this pattern prevents reinventing the wheel and makes effective use of existing assets in your EA. Table 2 shows the characteristics and applicability of the copycat pattern.

An example of this pattern is the copying of the low-cost airline business model and corresponding EA by a leading European airline, starting in the early 2000s. The disruptors could sell tickets for short and medium-distance flights in Europe for sometimes less than 25% of the ticket price of the incumbent airlines. As a consequence, they gained market share in the European airline industry very quickly. Their business strategy aimed at low-cost (very efficient) flight operations to cheaper airfields and aggressive marketing campaigns. The supporting EA consisted of IT assets aiming at high optimization of aircraft and crew, very easy-to-use electronic channels to sell tickets, and lower service levels. The incumbent airline copied

Copycat Pattern	
Current business strategy	Mainly companies with core strategies such as operational excellence or customer intimacy
Current EA maturity	Can be either low or high, although low EA maturity makes it harder to implement, as reuse of assets is more complex
Counter-strategy	Go-along
Level of disruption	Low/intermediate
Implementation effort (time and cost)	Medium or high, depending on EA maturity

Table 2 — Characteristics and applicability of the copycat pattern.

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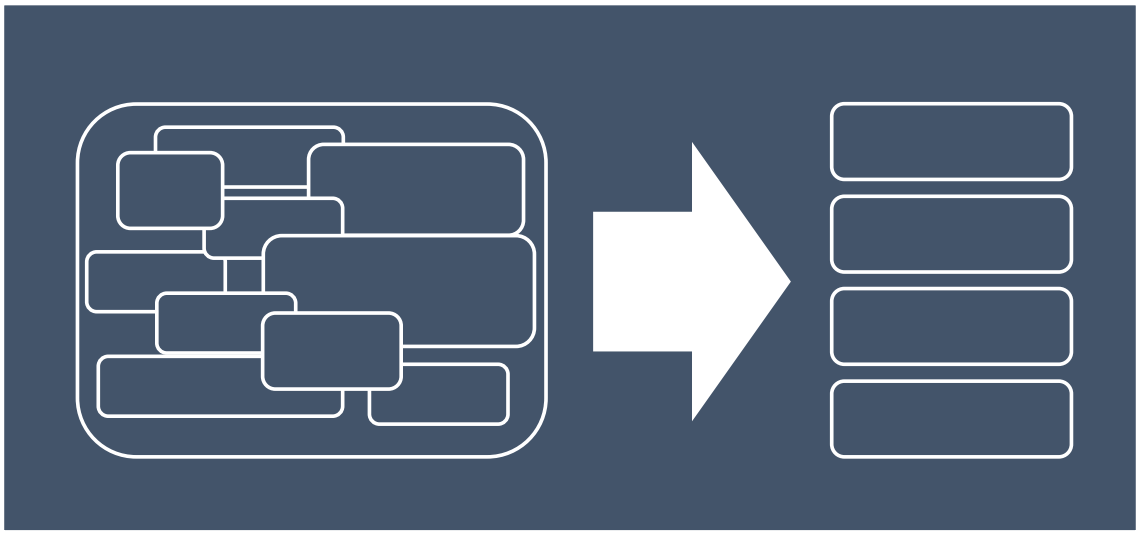

Figure 3 — The greenfield pattern.

that business model for their troubled subsidiary airline and used legacy EA assets (i.e., applications, websites, infrastructure, and customer data) from the mother company to support the subsidiary airline. Since then, the subsidiary has been profitable and contributing to the mother company whilst competing with the disruptors effectively.

Another example is a Benelux insurer confronted by disruptors that were providing a platform for peer-to-peer insurance. In reaction, they launched a new company to provide insurance based on a collective cost- and benefit-sharing model.

EA Pattern 3: The "Greenfield" EA

This pattern is in essence a new IT landscape needed for the disruption itself or its go-along or exit counter-strategy, leaving everything the current organization uses behind (see Figure 3). It acts as a startup company and sets up an EA from scratch or adopts the EA from an acquired company. This is suitable for organizations with a lower-maturity EA, organizations that have no real EA assets to be reused in a counter-strategy that must deal with large-scale disruptions, or both.

Not surprisingly, the greenfield pattern can be quite costly and time-consuming. With this pattern, it is very important to evaluate the IT investments needed based on the new EA. There is a huge benefit to adopting a more Agile, pragmatic approach in the beginning of your counter-strategy execution. From that you can assess the effects on market share, profitability, and customer satisfaction; learn from them; and reinvest for the next iteration. Table 3 shows the characteristics and applicability of the greenfield pattern.

A good example of this pattern is the go-along strategy chosen by a large Benelux supermarket chain. In late 2012, they found themselves being attacked, especially in the non-food sector, by e-commerce platforms that were rapidly gaining market share and expanding

Greenfield Pattern	
Current business strategy	All
Current EA maturity	Low
Counter-strategy	Go-along or exit
Level of disruption	High
Implementation effort (time and cost)	High

Table 3 — Characteristics and applicability of the greenfield pattern.

product catalogs from media to household and drugstore products. Their first choice was to counter-attack those e-commerce platforms by launching their own platform — a good example of a copycat strategy. Unfortunately, it came on the marketplace far too late, and despite the supermarket's solid brand name, the new platform failed to take off and gained no more than 10% of the market. By then, the Benelux e-commerce market leader was too powerful to attack head on. The supermarket chain chose to dramatically alter their strategy and acquired the market leader. From an EA perspective, this meant a total greenfield, since the EA from the e-commerce company differed totally from that of the supermarket chain. To ensure the optimum performance of the two different business models, the companies chose not to integrate their respective EAs.

Enterprise architecture is an asset that you can use to counter the threat of disruptors.

Implementation Success Factors

The success of implementing any EA pattern for disruption depends on a clear focus on customer outcomes and a learning organization. This can well be supported by Agile practices, experimentation, and continuous improvement. Also, companies have to look for opportunities to partner with others and establish an ecosystem around offerings. Flexibility and the ability to scale up quickly can be provided through cloud technology. In this way, long-term IT investments can be avoided.

Conclusion

There is no such thing as an easy way to counter disruptors. From a societal perspective, disruptions are sometimes welcome as a means to enhance our lifestyles and improve the world we live in. But from a company perspective, the appearance of disruptors may well lead to your bankruptcy or at least a diminishing presence in the marketplace. History is full of examples of companies that did not survive the dawn of a new business model or disruptive innovation. Who does not remember the fierce battle between Fujifilm, Kodak, and Polaroid in the photographic film marketplace before the digitization of imaging appeared in the 2000s? They all had to reinvent themselves, taking huge losses along the way. The same is happening in the mobility (Uber), media (Netflix, Spotify, Google/Alphabet), and hospitality (Airbnb) businesses.

It pays to really assess your current marketplace situation and learn from disruptors in your own or adjacent marketplaces. Enterprise architecture is an asset that you can use to counter the threat of disruptors. The three patterns we have introduced here may help you choose the right pattern for your EA, depending on the business model of the disruptor, your choice of counter-strategy, and your current EA maturity.

Endnotes

[1]Ries, Eric. *The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses*. Crown Business, 2011.

[2]Caudron, Jo, and Dado van Peteghem. *Digital Transformation: A Model to Master Digital Disruption*. 2nd edition. BookBaby, 2016.

[3]Giesen, Edward, et al. "Paths to Success: Three Ways to Innovate Your Business Model." IBM Corporation, 2007 (http://www-935.ibm.com/services/uk/bcs/pdf/paths_to_success.pdf).

[4]Wade, Michael. "7 Generic Strategies to Respond to Digital Disruption." IMD, May 2015 (www.imd.org/research/challenges/TC033-15-strategies-digital-disruption-michael-wade.cfm).

[5]Ross, Jeanne W., Peter Weill, and David C. Robertson. *Enterprise Architecture As Strategy: Creating a Foundation for Business Execution*. Harvard Business Review Press, 2006.

[6]Wade (see 4).

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Leveraging EA for Digital Business and IT Transformation

by Seema Jain and Vipin Jain

> Software is eating the world.
>
> — Marc Andreessen, cofounder of Andreessen Horowitz

The word "revolution" represents abrupt and radical changes. History shows us that whenever disruptive technologies and new ways of doing things trigger profound changes in economic systems and social structures, revolutions take place. The first one occurred millennia ago with the advent of farming and the domestication of animals. Since then, the introduction of gunpowder, the steam engine, electricity, the airplane, the telephone, the Internet, and others have represented further revolutions of varying intensity. Today we are at the dawn of another big revolution: the "digital revolution," characterized by the sharing economy, digital platforms, ubiquitous Internet, customer experience, mobility, cloud, Internet of Things (IoT), data analytics, machine learning, artificial intelligence (AI), robotics and automation, and more.

No industry is immune to the digital revolution, and most of them are in varying stages of understanding and responding to the phenomenon in the hope of retaining — and hopefully growing — their market share and becoming digital businesses. The vast majority of companies are already investing in digital transformation projects or are planning to do so.

Figure 1 provides a high-level overview of priority areas being addressed by digital business and IT transformation and some of the benefits achieved by companies as they become digital businesses. Overall they're increasing revenue, improving customer loyalty, boosting efficiencies, reducing costs, and transforming business models and processes. To maximize the potential of a digital business and IT transformation, however, businesses must overcome barriers that include talent gaps and a lack of leadership and organizational agility. Digital technologies such as IoT and AI are

Priority Areas	Benefits Achieved
• **Business Models** ○ Sharing economy ○ Digital platform ○ Innovation ○ "Coopetition" (simultaneous cooperation and competition) • **Operations and Maintenance** ○ Changing workforce ○ Optimized and streamlined processes ○ Marketing – data analytics ○ Customer experience • **Information Technology** ○ Digital platform, AI, and machine learning ○ Adaptive security architecture and intelligent applications ○ IoT, digital twins, and conversational systems ○ Virtual and augmented reality, mesh apps, cloud, and mobile ○ Blockchain and distributed ledgers, service architecture	• **Business Models** ○ Competitive products ○ Increasing revenue ○ Try often and fail fast ○ Network and collaborations • **Operations and Maintenance** ○ Employee productivity ○ Speed ○ Higher margins ○ Customer satisfaction • **Information Technology** ○ Agility ○ Simplification ○ Speed to deliver and market ○ Leverage both technology debt and emerging technology

Challenges Faced	
• **Lack of:** ○ Effective leadership to lead and manage change ○ Organizational agility ○ Culture for innovation	○ Comprehensive line of sight (mission through expected outcome) ○ Competent resources with required skills ○ Sufficient budget

Figure 1 — Digital business and IT transformation: priorities, benefits, and challenges.

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being embedded into core value-generating processes in business and society, transforming people's daily and professional lives.

Digital Business and IT Transformation Is a Journey

> The last 10 years of IT have been about changing the way people work. The next 10 years of IT will be about transforming your business.
>
> — Aaron Levie, CEO of Box

Digital business and IT transformation is a very complicated undertaking. The starting point can vary, but in general it involves adoption of disruptive technologies and emerging business models, which in turn demands changes to organizational structure and business capabilities and processes. Transformation requires delicate, timely, and successful execution and management of changes being made to all aspects of a company, including business models, operations, and underlying IT, while optimizing use of resources and delivering innovative business capabilities. Having participated in and led multiple digital business and IT transformation initiatives, we believe that having a successful, well-connected, and respected enterprise architecture (EA) group with experienced enterprise architects is critically important in an organization's effort to become a successful digital business. EA provides an approach for understanding and managing the complexity of digital transformation.[1] As shown in Figure 2, EA plays a central role in enabling the transformation of a current business (or a startup, or a new line of business) into a digital business, while considering and supporting overall strategic digital business and IT strategy. Now let's review the key components of digital business and IT transformation.

Digital Business and IT Strategies

> Silicon Valley is coming, and if banks don't up their game, then tech companies will take over the industry's business. There are hundreds of startups with a lot of brains and money working on various alternatives to traditional banking.
>
> — Jamie Dimon, CEO, JPMorgan Chase

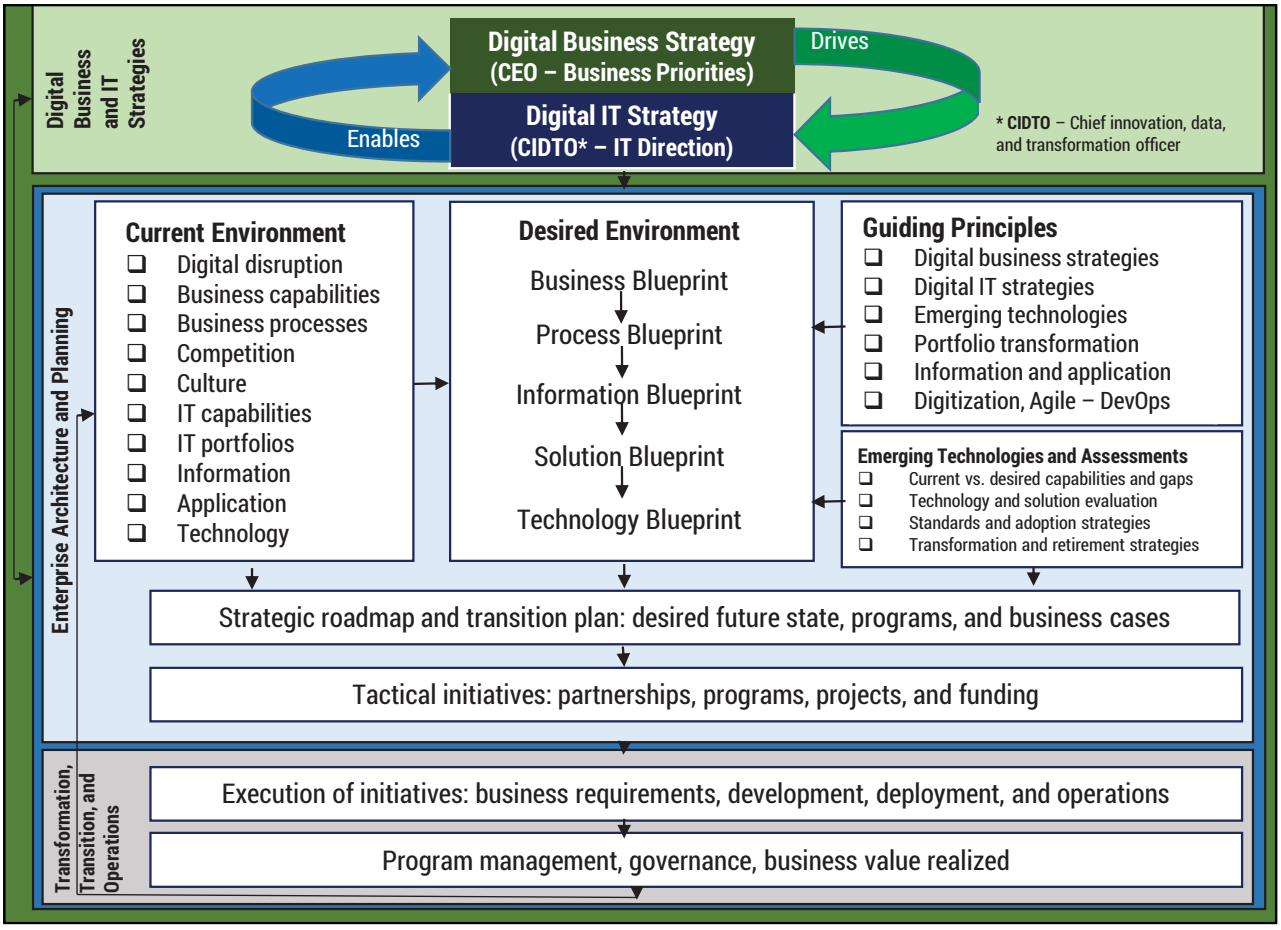

Figure 2 — Digital transformation is a continuous journey, and EA plays a vital role in managing the complexity involved.

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Executives like Dimon are taking the risks associated with digital disruption seriously and not only confronting them directly, but taking advantage of the opportunities these disruptions present. Digital leaders continuously stay ahead of the curve in terms of new technologies and business models, invest heavily in developing optimized innovative solutions, and disrupt their own industries (or at times create brand-new ones) in order to remain industry pioneers and leaders. As seen in Figure 2, digital disruption, competition, and emerging trends are driving overall digital business strategies, which then drive digital IT strategies. Effective digital IT strategies and successful execution of long- and short-term plans enable organizations to realize the goals of digital business strategies and provide guidance to enterprise architecture. Consider some digital pioneers that have disrupted their own industry or created one that did not previously exist:

- Netflix disrupted the overall video/game rental industry first by providing unlimited DVDs by mail and then by offering video streaming. The company has continued to disrupt the entertainment industry by becoming a producer of TV programs, with 90+ million subscribers. Within a decade of its existence, Netflix forced previous industry leader Blockbuster into bankruptcy.
- Amazon, a pure digital company, disrupted the retail market, resulting in the closing of many electronics store chains and malls while increasing its customers' loyalty. By leveraging its cost-effective and time-sensitive supply chain and fulfillment capabilities, Amazon continues to disrupt many other industries, such as groceries (with the acquisition of Whole Foods) and cloud services (having become the leading IaaS/PaaS/SaaS provider, with over 140+ services). Within 11 years, Amazon Web Services has become the number one cloud provider, moving way ahead of such firms as Google, Microsoft, and IBM.
- John Deere is transforming itself from a company that sells and services big equipment to a company that helps farmers find more efficient ways to grow crops by utilizing new technologies like IoT, drones, and data-centric capabilities.

Digital disruption is becoming an essential part of the normal business cycle. To survive and thrive in this era, businesses need to fully grasp the leading new technologies; the shifting business, operational, and IT paradigms; and the implications of both for business — while proactively planning for disruptions caused by it all. Without proper planning for these disruptions, there is a high risk of becoming irrelevant in a short period, as businesses may not be able to compete successfully in dynamic markets. In today's fast-moving environment, strategic, practical, and innovative partnerships between business and technology executives play a critical role in helping businesses respond to these forces of change.

As depicted in Figure 3, a paradigm shift is taking place across business models, supporting operations, and underlying information technologies. Leveraging any one of these by itself is quite disruptive and challenging, but when combined together, they represent a very complex

Information Age	Digital Age
Business Models	
Buying economy Single-purpose products Competition as zero-sum game	**Sharing economy** Connected multipurpose products Strategic cooperation
Operations	
Defined industry boundaries Producer and user roles	Digital platforms and business economies Co-creation and user as a producer
Information Technology	
Public cloud and online marketing Big data Smart building Digital payment Mobile apps Real-time chat Productivity tools	Digital technology platform Data analytics and **AI** IoT and drones **Blockchain** and distributed ledgers Wearables Virtual and augmented reality Intelligent applications

Figure 3 — Shifting business, operations, and IT paradigms.

undertaking with associated risks and awards. When it comes to emerging business models or technologies, we need to understand where they come from; how they will fit, benefit, and/or pose risk to the business; and where they are going. Each one of these elements could potentially have social, ethical, legal, financial, or governance implications, and these need to be addressed as well. Before we leverage new business models or technologies in the development of business solutions, we need to comprehend them holistically. Enterprise architecture and architects play a vital part in managing this complexity while delivering promised business value. Let us briefly look at three of these emerging trends and technologies.

Once a company has committed itself to an executable digital business and IT strategy, management must define and implement an operating model that allows for execution of that strategy.

Sharing Economy

The sharing economy allows individuals or businesses to use a service or rent an asset (with or without value-added services owned and provided by someone else), most probably using a digital platform. Such an economy allowed companies like Uber and Lyft to become leading providers of taxicab services without procuring any vehicles. Similarly, Airbnb has become one of the leading hospitality companies, with the largest number of available rooms and properties, without acquiring any properties itself. Instead these companies have provided an efficient digital platform for consumers and providers to conduct seamless transactions.

The sharing economy model is most likely to be used when the price of a particular asset or service is high and the asset is not fully utilized all the time. One thing to fully understand and plan for is possible legal liability and/or security issues.

Artificial Intelligence

AI makes us think of self-driving cars, drones delivering our holiday packages, and computers defeating humans at board games. Perhaps we might even envision Skynet from the *Terminator* movies running amok. Some pundits are talking about a massive shift in our society as AI, combined with robotics and automation, threatens to replace large numbers of people in the workforce within the coming decades. Should the use of AI, robotics, and automation come with some sort of tax or a policy to provide a minimum support structure for people replaced by them? While AI offers great potential and is being pursued by many leading businesses, it poses some potential risks as well. Would-be adopters will need to consider these benefits and risks carefully and strike a balance between them.

Blockchain

Over a short period of time, blockchain has gone from being a small presence (Bitcoin) to one of the most talked about technological innovations. As Harvard Business School (HBS) Professor Marco Iansiti and Cutter Fellow and HBS Professor Karim R. Lakhani observe:

> The technology at the heart of bitcoin and other virtual currencies, blockchain is an open, distributed ledger that can record transactions between two parties efficiently and in a verifiable and permanent way. The ledger itself can also be programmed to trigger transactions automatically.... With blockchain, we can imagine a world in which contracts are embedded in digital code and stored in transparent, shared databases, where they are protected from deletion, tampering, and revision.[2]

This could have extensive implications for the way contracts are written, financial transactions occur, and the healthcare industry operates.

Once a company has committed itself to an executable digital business and IT strategy, management must define and implement an operating model that allows for execution of that strategy. The operating model will incorporate considerations such as policies, processes, organization structures, and performance measures, with a focus on innovation, time sensitivity, and team dynamics to retain a competitive edge. Senior leadership needs to clearly articulate the strategy and the operating model to the people involved and encourage everyone to take responsibility for business success.

Enterprise Architecture and Planning

> It is not the strongest of the species that survives, nor the most intelligent that survives. It is the one that is the most adaptable to change.
>
> — Charles Darwin

Successful enterprise architects and architecture strive to align key stakeholders around a set of differentiated, optimized, and innovative business capabilities through

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seamless integration of people, data, process, and technology to enable businesses to achieve their vision and goals. It is an ongoing process, driven by digital business and IT strategies focused on achieving expected business value. EA provides a long-term view of an organization's vision, strategic direction, capabilities, supporting operations, and IT portfolio so that individual projects can work toward building these capabilities instead of just fulfilling immediate needs in silos. Based on the age, nature, and maturity of your business, you may have a mixed bag of digital and legacy capabilities, or you may be just starting out (or venturing into a brand new business area) without any legacy to transform.

Irrespective of your current capabilities and portfolio size, EA is valuable for moving quickly into new and adjacent markets, pivoting rapidly to seize new opportunities for revenue generation, and bringing new business models up to speed before your competitors can react. Efficient EA should provide a comprehensive understanding of current and desired capabilities, services, solutions, systems, information, applications, and all other components of your IT portfolio, aligned with the constantly evolving needs of the business. When the business needs change, your EA should enable you to adapt and respond in short order.

Guiding Principles

Enterprise architecture guiding principles are high-level fundamental tenets that direct business and technology leaders and enterprise architects in the decision-making process. Even though such principles will be specific to each organization based on its needs, the following should be applicable to most:

- EA is a business-driven process. A technology-first approach that doesn't align to digital business and IT transformation efforts will fail to deliver the anticipated return.
- EA must link strategy, business, people, process, technology, and operations. It is most effective when it simultaneously supports top-down executive planning and decision making across the enterprise and bottom-up management planning and decision making within each line of business.
- The approach to enterprise architecture must be flexible and customizable to address business requirements and respond effectively to digital disruption, including emerging technologies and business models. It should focus on agility, innovation, business value, and efficiencies.
- EA should serve as a compass, directing an enterprise toward its intended operating model and ensuring each initiative achieves both local and enterprise-wide objectives.
- Enterprise architects should make an early decision on what framework and tool, if any, they will use and which primary EA artifacts will be developed by whom, when, and for what purposes.
- Enterprise architects should concentrate on both short- and long-term benefits, to continually demonstrate the business value of EA while retaining and growing senior leadership support.
- It is critical for enterprise architects to collaborate and work closely with other organizations as they guide the development, sharing, and integration of a single view of the business and technology landscape — in other words, the enterprise architecture.

EA is valuable for moving quickly into new and adjacent markets, pivoting rapidly to seize new opportunities for revenue generation, and bringing new business models up to speed before your competitors can react.

EA Benefits

A successful EA implementation should yield a number of benefits around decision making, resource optimization, and the ability to respond quickly to disruptive trends and technologies. Even though the exact benefits achieved will be unique to each organization, the following should be applicable to most:

- Increased speed and ability to translate the organization's strategy into the necessary initiatives and investments
- Efficient portfolio-driven strategic decision making — the ability to analyze increasingly large and complex environments, assess the impact of disruption, and develop a strategic plan to address it
- The ability to manage and maintain relevant artifacts in one repository
- An integrated digital business model, including business model, operational model, and supporting IT
- Efficient resource management — cost, facilities, infrastructure, applications, and people

- Improved usage of shared services — cloud-based solutions and elimination of silos
- Agility — improved responsiveness to business requirements and digital disruption
- Improved risk management — reduced business risk, increased disaster recovery/business continuity planning capacity

It is vital to communicate the value of EA through tangible results, whether these are quick wins or the realization of long-term strategic goals.

EA Objectives

An organization's approach to developing various EA artifacts will be influenced by the selected EA frameworks and tools, if any. Regardless of the chosen framework or tool, the basic intent of enterprise architecture remains the same and focuses on the following:

- Comprehending the overall strategic direction and guiding principles so as to make strategic decisions
- Understanding the current environment, including the competition, capabilities, and IT portfolio
- Evaluating disruptive technologies, business models, and solutions
- Establishing standards and developing adoption, transformation, and retirement strategies
- Defining the desired environment and blueprints to address today's business requirements while anticipating future ones
- Identifying gaps and the key initiatives required to fill them; understanding dependencies between initiatives and the organization's capacity to move forward (and the limitations to that capacity)
- Developing technology roadmaps and transition plans to achieve the stated business vision
- Collaborating, communicating, and demonstrating the ongoing value of enterprise architecture in order to sustain key stakeholders' buy-in

EA represents change, and most people resist change until they clearly see the value of it for themselves. It is vital to communicate the value of EA through tangible results, whether these are quick wins or the realization of long-term strategic goals.

Targeting EA to Digital Business and IT Transformation

Even though all of the elements described above are important aspects of traditional EA, given the pace of digital disruption and the need to move fast in response to competition, businesses may want to think carefully about which parts of EA are most important for them and how much effort they should focus on those. Each transformation initiative is unique, and so should be the transformation approach and the EA group's focus. Consider the following examples in which various organizations used a personalized version of an overall transformation and EA approach to meet their specific requirements:

- In Company A, the leadership decided to expend a bare minimum of effort to understand their current environment (IT portfolio, operations, etc.), focusing instead on their desired environment and evaluating emerging cloud-based solutions to reduce time to deliver on required capabilities. Their strategic direction was to move out of the business of IT and concentrate on their core business capabilities, which resulted in a shift from a CAPEX to an OPEX model.
- In Company B, the leadership decided to focus on bringing in new capabilities through the optimization of their current business processes, simplifying their IT portfolio while transforming it to the selected platform. This required a heavy emphasis on business process reengineering and modeling as they sought to leverage the portfolio's full capabilities with minimum custom code.
- In Company C, the leadership decided to leverage DoDAF as a framework. But although the framework suggested 63 types of views, the company chose to develop only 15. This allowed them to concentrate on the views that were critical for them and make optimal use of resources.

EA can be an effective tool for addressing digital and IT transformation in businesses of any size, as long as they are not rigid about their approach and do not try using a big hammer where thumb pressure will work. It is important for enterprise architects to tailor their EA approach to what is feasible in the organization. Enterprise architecture sounds like a technical discipline, but it is primarily focused on business, and management of it should be the joint responsibility of the business, operations, and technology groups.

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Think of EA as a framework for enabling all the disparate parts of the enterprise to function together as one seamless engine of productivity. EA allows for the ongoing synchronized alignment of business, operations, and IT. Without this alignment, businesses are exposed to risks, and bringing new products and services to market to meet the shifting demands of their customers becomes difficult.

Transformation, Transition, and Operations

> One IT executive in an investment banking company claimed that 80% of his company's programming code was dedicated to linking disparate systems, as opposed to creating new capabilities. The significant problems we face cannot be solved by the same level of thinking that created them.
>
> — Jeanne W. Ross, *Enterprise Architecture As Strategy: Creating a Foundation for Business Execution*[3]

Figure 4 provides a high-level overview of the primary characteristics of many current businesses, the desired capabilities of a digital business, and the kinds of technologies and initiatives that may be required to get from one to the other. Through its various blueprints of the desired environment, strategic roadmaps, and transition plans, EA provides a vision and a high-level plan to start the process of transformation. Although digital transformation may require the introduction of some new technologies, business models, or processes, this is neither a requirement nor does it guarantee the transformation of your current business into a digital business.[4] What is required for efficient transformation is an effective holistic plan for optimizing the overall portfolio within the scope. How should business processes be redesigned to support required capabilities, and who should decide on what gets retired, retained, re-architected, replaced, and/or developed? It requires an active collaboration between enterprise architects, solution architects, and individual project teams who are leading the individual initiatives as they move forward with detailed architecture, transformation, and deployment activities.

The transformation of a portfolio is a continuous and longer process, with a focus on getting to a stage where the current portfolio is serving business needs well and is proactively being modernized to respond to future needs. EA is an enabler of this process, providing ongoing support as other teams take a bigger role after initial planning and architecture.

Designing for Digital Disruption

> At least 40% of all businesses will die in the next 10 years… if they don't figure out how to change their entire company to accommodate new technologies.
>
> — John Chambers, Executive Chairman, Cisco Systems

There is no one right digital business design, but given that digital businesses are more integrated and automated than traditional businesses, they must be more explicitly designed. Digital businesses are heavily dependent on software to facilitate seamless end-to-end experiences; store, process, and analyze data; and bring new products and services to market. As a result, companies need to be designed with the same kind of detailed attention to component interaction that is applied in complex systems design.

The design of a digital organization starts with a digital business, operations, and IT strategy. Because digital technologies offer a constant stream of new opportunities, the best digital strategies provide a clear direction while remaining responsive to shifting circumstances and prospects. As a result, digital strategies tend to be more visionary than traditional business strategies.

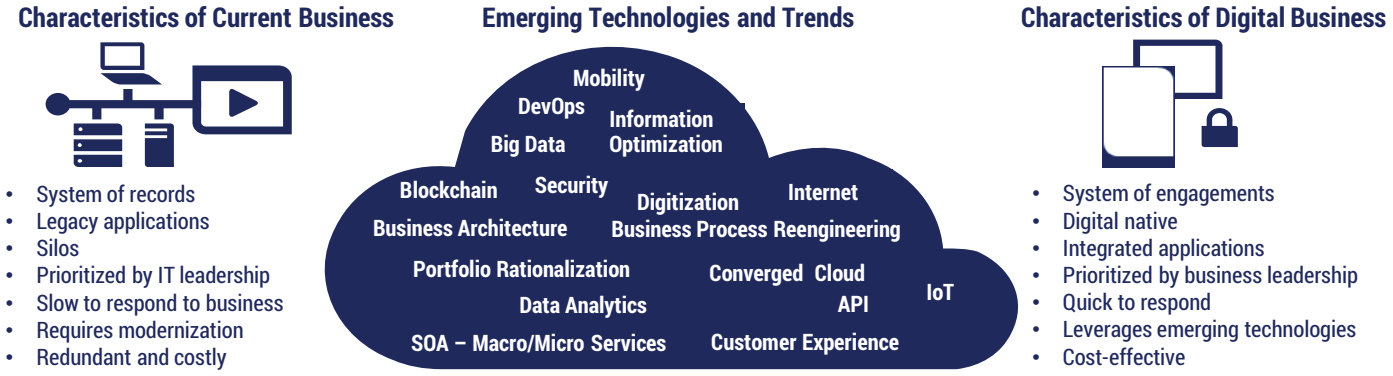

Figure 4 — Characteristics of current and digital businesses and enabling technologies.

The practice of enterprise architecture creates one enterprise view of the operating model — synchronizing stakeholders and creating an organizational blueprint that charts the future of the business and drives strategic decision making around investments and priorities. EA approaches need to adapt for a digital economy and bridge the gap between business strategy and execution.

In closing, we'd like to leave you with an observation by Amazon founder and CEO Jeff Bezos:

> In today's era of volatility, there is no other way but to reinvent. The only sustainable advantage you can have over others is agility, that's it. Because nothing else is sustainable, everything else you create, somebody else will replicate.

As digital disruption accelerates, having an effective EA group is now more valuable to organizations than ever before. Digital transformation is essential, and the enterprise architect plays a critical role in its success.

Endnotes

[1]Bossert, Oliver, and Jurgen Laartz. "How Enterprise Architects Can Help Ensure Success with Digital Transformations." McKinsey & Company, August 2016 (www.mckinsey.com/business-functions/digital-mckinsey/our-insights/how-enterprise-architects-can-help-ensure-success-with-digital-transformations).

[2]Iansiti, Marco, and Karim R. Lakhani. "The Truth About Blockchain." *Harvard Business Review*, January-February 2017 (https://hbr.org/2017/01/the-truth-about-blockchain).

[3]Ross, Jeanne W., Peter Weill, and David C. Robertson. *Enterprise Architecture As Strategy: Creating a Foundation for Business Execution*. Harvard Business Review Press, 2006.

[4]Kane, Gerald C., et al. "Strategy, Not Technology, Drives Digital Transformation." *MIT Sloan Management Review*, 14 July 2015 (http://sloanreview.mit.edu/projects/strategy-drives-digital-transformation).

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Beyond Disruption: Can We Truly Architect Our Digital Futures?

by Roger Evernden

Whether we choose to face it or not, digital disruption is here to stay. Whether we choose to accept it or not, digital disruption will affect every enterprise.

Regarding the first of these claims, digital disruption is the transformation that occurs when new digital technologies and business models have a big impact on the value proposition of existing goods and services. The evidence shows that we are constantly being exposed to new digital technologies, and there is a steadily growing range of alternative business models.

The second claim is more open to debate. Some might argue that digital technologies and new business models won't affect them. In contrast, there is a growing chorus of commentators who suggest a very different future for all of us.

Ringing the Digital Changes: A Different Future for Us All?

The jury on our digitized future is still out, and it may be some time before it comes to a unanimous conclusion. In the meantime, there are plenty of serious writers and researchers who predict some significant changes in our world. Below I sketch some of these ideas so that you can consider them in your future planning scenarios.

Beyond "Enterprise"

Although we enterprise architects will probably continue to call our discipline "enterprise architecture" (EA), it is increasingly the architecture of any human-designed system — including all social, political, economic, environmental, and cultural organisms *as well as* the enterprise.

In the not too distant past, EA was only concerned with components that were either developed or used within the secure walls of the enterprise. But nearly all enterprises now utilize common, globally available components — the most obvious examples being the data and functionality that are provided through the Internet and its architecture. In addition to this, many enterprises participate in industry-wide architecture forums. Some of these develop common domain reference models, while others develop common building blocks. Examples include the concept of a smart grid to optimize the management and use of energy and the efforts of players in the UK banking sector to introduce faster payments.

The jury on our digitized future is still out, and it may be some time before it comes to a unanimous conclusion.

Another innovation is social architecture, which is an exciting variation on enterprise architecture. It applies techniques from disciplines such as EA, mixed with available social technologies, to address the need for organizational and community change. Essentially it takes EA beyond the boundaries of an enterprise and explores the possibility for architectural change in the broader environmental context.

From an EA perspective, this trend becomes very interesting, because the ratio of components that are managed within the enterprise to components that are managed by a consortium or by public consensus is rapidly shifting toward the latter. In other words, EA teams cannot directly govern common, industry, social, or environmental components; instead, they must either engage in the relevant forum or community or use internal (enterprise) components to "influence" the wider landscape. For example, a team might introduce a game-changing component that is then adopted as a critical component in the broader architectural context. All these changes are a consequence of digital disruption.

Smarter Components

Another major departure from traditional EA is that digital technologies allow us to include information, processing, and "intelligence" in many (arguably all)

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physical components. This development is already common — we know it as the Internet of Things. As *WIRED* author Matt Burgess writes, "Smart toasters, connected rectal thermometers, and fitness collars for dogs are just some of the everday 'dumb items' being connected to the web as part of the so-called Internet of Things (IoT)."[1] The possibilities here are pretty much limitless, which in turn increases the potential for digital disruption.

Watch out for competitors who include sensors and intelligence in components that you might not anticipate — this is where the real threats lie.

Some opportunities will be more obvious than others. For example, a business that provides transportation services would find it fairly straightforward to monitor its timetable and provide feedback on deliveries or the next train to London. But watch out for competitors who include sensors and intelligence in components that you might not anticipate — this is where the real threats lie. For instance, it would be possible to track clothing items that a shopper picked up and tried on, and then to use this information to encourage them to buy those items. If your rival's products have this capability and yours don't, you will find yourself at a competitive disadvantage.

Speaking of threats, the information and functionality provided by intelligent components might also be accessed by unexpected and even criminal players. IoT botnets have already abused a network of out-of-date devices to attack websites and services and hold them to ransom. Imagine hackers hijacking an insecure network of motorway security cameras and using them to disrupt traffic or to organize an attack on a truck carrying gold bullion.

The EA team must consider the threats posed by smart objects, as well as their potential business value. In addition, EA teams need to be aware that a key quality of IoT components is their compatibility with other components, in particular those existing in the enterprise architecture. This opens up a whole new area for the EA discipline, increasing the complexity of the extended EA and requiring the architect to understand an even broader range of component types.

Default to Public

Web 2.0 is another fascinating contribution to digital disruption. Increasingly, the Web works because everyone connected to it also contributes to it. We willingly (or at least, unknowingly) participate by making our blogs, posts, pictures, videos, observations, and comments public. Unless you declare data private — and possibly even then — it becomes part of the huge global public domain. This is a huge shift: it is the force behind crowdsourced resources such as Wikipedia replacing commercially produced encyclopedias such as *Encyclopedia Britannica*. If your enterprise currently builds value through information that you gather and use in-house, then you could be undermined by competitors who source their information from the crowd at little or no cost. Because the authority of this data comes from the original source — the person whose view it represents — it is often seen as more trustworthy or valuable than information from corporate sources. After all, whose description of a holiday resort would you trust more? One provided by the resort itself or a TripAdvisor review written by someone who had actually stayed there?

Free Production Costs

Another quality of digital is that it allows intellectual property to be quickly, easily, and freely replicated — in contrast to the cost, time, and resources needed to create a new physical product. This is a mammoth challenge to ownership and copyright.[2]

Consider two scenarios. In the first one, the business model is based on a linear production line, where raw materials are bought and shipped to a factory, converted into products, distributed via warehouses to retail stores, and finally marketed and sold to customers. At each step in the value chain, the suppliers, manufacturers, distributors, retailers, and marketers all take their cut. In the second business model, musicians produce music at their own cost and expense, then they sign up with a company that will distribute their music digitally across all the many streaming and sales channels and collect the resulting revenue. This business model is much less complicated, and once the channels and functionality are created, there is very little overhead or cost for replicating the music.

From an EA perspective, there are two major differences between these models. The first is that the type of components in the respective EAs are poles apart: there are many interfaces with physical components in the first

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scenario, while the second is almost entirely digital. The second is that expanding or changing the architecture is easier and quicker in the digital scenario. To add a new distributor for the online music might be as simple as adding a few parameters and some new lines in a database.

Who Pulls the Strings?

The next digital change that I'd like to highlight concerns a power transition. Unlike earlier historical eras, when nations and governments were the dominant forces, the ascendant powers in the 21st century are increasingly cities and regions (e.g., Beijing, London, Silicon Valley)[3] or companies and organizations (e.g., Facebook, Royal Dutch Shell, the Bill and Melinda Gates Foundation).

What does this mean for EA? Consider an ongoing dilemma that many companies are facing at present. The UK's decision to leave the European Union has led to a great deal of uncertainty, with the result that some companies are contemplating relocation. For example, a financial services company might decide that London is no longer the best hub in which to headquarter its business and might consider Frankfurt, New York, or Hong Kong as an alternative. A car manufacturer may choose to relocate from the UK to the Republic of Ireland or France to get the best deals on imports and exports. From an EA perspective, changing locations might require considerable changes to the architecture to accommodate differences in the legal environment, taxes, workers rights, data restrictions, or consumers rights.

Now think about your existing stakeholders. Until recently, most EA teams that I have worked with listed stakeholders who were almost entirely members of the enterprise. Today, social media plays a much more important role in your future business model. It may be that Facebook, Amazon, or Google has become not just a stakeholder, but the most important one!

The Really *Big Picture: Postcapitalism, Evolution, Population Growth, and Global Warming*

Even more significant are changes that may happen on a global scale. Again, digital technology or information is either a driving force behind these expected changes or a significant enabler of them. Below I outline some of these onrushing changes and how they affect EA.

Mason on Postcapitalism

In *Postcapitalism: A Guide to Our Future*, author Paul Mason presents a powerful argument for the demise of capitalism.[4] Mason's basic premise is that capitalism cannot survive in its present form and that it might be supplanted by a more socialist world.

As an enterprise architect, I read Mason's book to learn about potential threats that might affect my clients and their strategies. A key characteristic of capitalism is that it is based around the concept of growth — and consequently nearly all business models include growth as one of their core tenets. Therefore, enterprise architectures are predicated on supporting this notion. If we accept Mason's argument that unbridled growth will cause irreparable damage to the resources of this planet, it means that a central tenet of capitalism is no longer sustainable. This would probably invalidate 90% of our current business models.

The companies that will survive and thrive in a postcapitalist environment are those that respond effectively to the challenge — namely, rethinking their business model by replacing growth with different values.

As in any other disruptive situation, the companies that will survive and thrive in a postcapitalist environment are those that respond effectively to the challenge — namely, rethinking their business model by replacing growth with different values such as community and social values. For example, rather than focusing on greater profits and increasing market share, a bank might look at educating individuals and companies in more effective use of their finances. Or it might encourage investment in initiatives that benefit the majority of the local community. This vision may appear fanciful, but population increases, the rapid modernization of what was previously known as the Third World, and the clear limitations of natural resources might force us to take such arguments seriously.

The trends that I discussed above — which follow the digitization of our world and the growing importance of information as a core resource — play into thoughts about the demise of capitalism. There's no denying that the ease of replicating and using information produces a very different dynamic from the value-chain model and the more limiting overheads of physical products.

What can an EA team do with these ideas? Well, in the short term, the architecture can be expanded to include components and values that meet both a capitalist business model and a postcapitalist one. In many companies, providing additional values can only strengthen

the business model and give it resilience against possible futures. A strong response to both digital disruption and a potentially postcapitalist future is to embrace the architectural possibilities they offer and to produce EA strategies that allow decision makers to assess these options.

Harari on the History of Humankind

Many of the trends and arguments Mason describes are also supported by the narrative in *Sapiens: A Brief History of Humankind* by Yuval Noah Harari.[5] Harari makes a key distinction between the biological and social evolutions of our species, *Homo sapiens*. By biological evolution, I mean the process by which living organisms change over successive generations. In the past, such changes have usually been attributed to genetic variation and natural selection. In contrast, social evolution refers to the behavior of people within a community. This includes how society is organized; how groups of people live and work together as a unit; and the various structures, laws, theories, concepts, and ideas that form our societies and cultures. Biological evolution happens directly to individuals within a species; social evolution happens collectively as a consequence of the actions of a community or group of individuals. Social evolution is the side that we can more directly influence through our ideas, concepts, planning, and actions.

Maybe architecture in general is simply a discipline that applies to anything designed, created, or managed by *Homo sapiens*.

In EA terms, new concepts and components that are added to an architecture have both a direct and indirect influence on the future behavior, use, and direction of that architecture. The consequences are both planned and unplanned, expected and unanticipated. When we introduce some new components and configurations, they can produce a significant and positive change. Other changes might have little consequence, and still others might produce damaging outcomes. Who could have foreseen that a few protocols and concepts could produce the mammoth changes of the Internet?

When I read *Sapiens*, it suggested to me three big questions for enterprise architects to consider:

1. **Can the discipline and techniques of enterprise architecture really help us to predict, plan, and manage our futures?** To some extent, we have already answered this question — if we didn't think we could make a difference, we wouldn't bother to be enterprise architects! But can we really be "gods" and control our destinies, or is our role more limited to influence?
2. **What is the scope of "enterprise" architecture?** Architects already support all types of enterprises — including commercial, government, educational, and nonprofit enterprises. So it is no great leap to envisage EA techniques being applied to wider environmental, economic, political, cultural, and social contexts. Maybe architecture in general is simply a discipline that applies to anything designed, created, or managed by *Homo sapiens*. And whereas building architecture is focused more on the tangible or physical aspects of construction, enterprise architectures concentrate more on the intangible, conceptual, or digital realm.
3. **What is the best way for us to anticipate, influence, prepare for, and/or manage our futures?** I explore this question in more detail in the "Options for Architecting Our Digital Futures" section below.

Gore on Global Warming

In his book *The Future*, former US Vice President Al Gore examines the six broad drivers of change that our world is facing:[6]

1. A more globalized economy
2. Planet-wide electronic communications and developments in robotics
3. A new political economy in which influence and initiative are shifting from West to East
4. Unsustainable population growth and resource depletion
5. Advances in biological, biochemical, and materials science that enable human beings to reshape the fabric of life as never before
6. A radically unstable relationship between human civilization and the earth's ecological systems, particularly its atmosphere and climate

The digital revolution is one of the key enablers that has allowed *Homo sapiens* to become such a dominating species on this planet. The world is becoming a radically different place. The critical question for EA is whether our architectural thinking can help shape our futures, or whether *sapiens* has unleashed a set of closely interconnected and mutually reinforcing forces that cannot be tamed.

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The EA Upshot?

Why does this matter to EA? I passionately believe that EA has produced a set of techniques that can help us see the big picture and produce patterns that will induce positive, emergent behavior in our architectures. We can cast a stone that produces a ripple that washes over everything. Let's make it a positive force.[7]

Options for Architecting Our Digital Futures

I hope that the previous section has given you a flavor of the bigger forces for change that are likely to combine with the digital and information revolution to create radically new architectures.

As enterprise architects, what can we do about all this? Let's assume that you have a short-, medium-, and long-term plan for the evolution of your enterprise architecture. Whenever any disruptive force comes along, you have three options (shown in Figure 1):

1. **Continue planned EA change.** You might choose to continue with your current plan, unchanged, and ignore the possible threats. In other words, you feel that you have already addressed these concerns.
2. **Reactive EA response.** You might react to the disruption by adopting a temporary fix to address the immediate threats; this is followed by further reactive changes as the situation develops. For example, some brick-and-mortar book retailers responded to Amazon's digital invasion by reducing their prices. This allowed them to survive for a short time, but it made their business model unsustainable. This response didn't seriously look at the need to change both the business model and its supporting enterprise architecture, perhaps by including digital distribution and creating a distinctive Internet presence.
3. **Proactive EA response.** You might really consider the disruptive possibilities outlined in the previous section and act accordingly. For example, a book retailer might choose to concentrate less on growth and more on providing a community hub and meeting place. In the banking world, many financial institutions are struggling to create a new vision for their branches; as customers increasingly switch from visiting a branch office to transacting online, the role of the branch has changed. Perhaps if banks focused less on "selling" products and more on providing much-needed local facilities, it might mean that many branches wouldn't have to close down. In the UK, for example, a bank branch might become a place to get financial advice, or it could become a coffee shop and/or a post office.

Which option will you choose? At the heart of your decision (apart from any political or resource considerations specific to your organization) is the deeper question: to what extent can we truly architect our futures? Some might argue that as systems and architectures get increasingly complex and intertwined, it becomes harder — or even impossible — to anticipate, predict, plan, and/or manage their evolution.

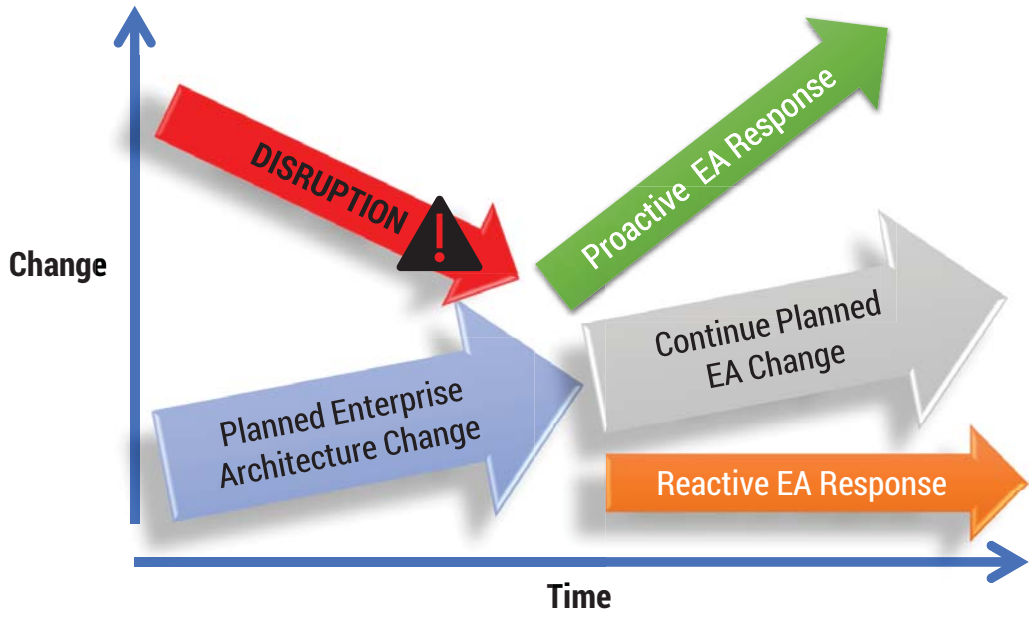

Figure 1 — EA responses to disruption.

A Risk Management Approach

There are no "right" answers, as we will see. My recommendation for addressing this dilemma is based on the ideas of author Greg Craven,[8] who was concerned about one of the six change drivers Gore identified — global warming. He realized that fighting over the facts about climate change and debating whether there really was cause for concern didn't matter. Instead, he approached the situation by looking at the risk involved in each of the potential responses to the problem.

In EA terms, Craven recognized that there is a "concern" about global warming — and this concern is real, even if the existence of global warming is still debated. Craven argued that if we act but later realize that global warming wasn't important, then we will have taken actions we didn't need to take. Conversely, if we don't act and global warming is a catastrophic issue, then it might be the end of the planet and our future. Inaction carries the greater risk.

From a risk perspective, the same thing is true of digital disruption — and we need to make sure that we avoid thinking wrongly about it. It may pose a risk to our enterprise, or maybe there is no risk. The best response from the EA team is to examine digital disruption, understand the implications in terms of the components and configuration of the architecture (i.e., translate them into architectural thinking), and present options for responding as potential changes to the architecture. The important thing is to present these options as clearly as possible so that stakeholders can make architecturally informed decisions.

Following Craven's lead, our EA responses are shown as four options along two axes: understanding and action (see Figure 2). We first ask ourselves, how well do we understand the concerns surrounding the potential digital disruption? Secondly, do we take action or not?

- **Option A: Good understanding, action taken.** If we have a good understanding of the issues around digital disruption and we act, then we will likely succeed. This is the ideal response — the concern is understood from an architectural perspective, and we have produced an effective response. The UK book retailer Waterstones responded to the digital threat by encouraging browsing in its stores, which often include a café, and by building a digital presence in addition to its physical locations. The focus remains on its core product — books — but architecturally Waterstones added an equally important online channel along with new services and capabilities.
- **Option B: Weak understanding, action taken.** This is the second best choice. Even if our understanding is not so good, we may well be lucky and come up with an effective plan. If we are less lucky, what's the worst that could happen? It might be that the actions

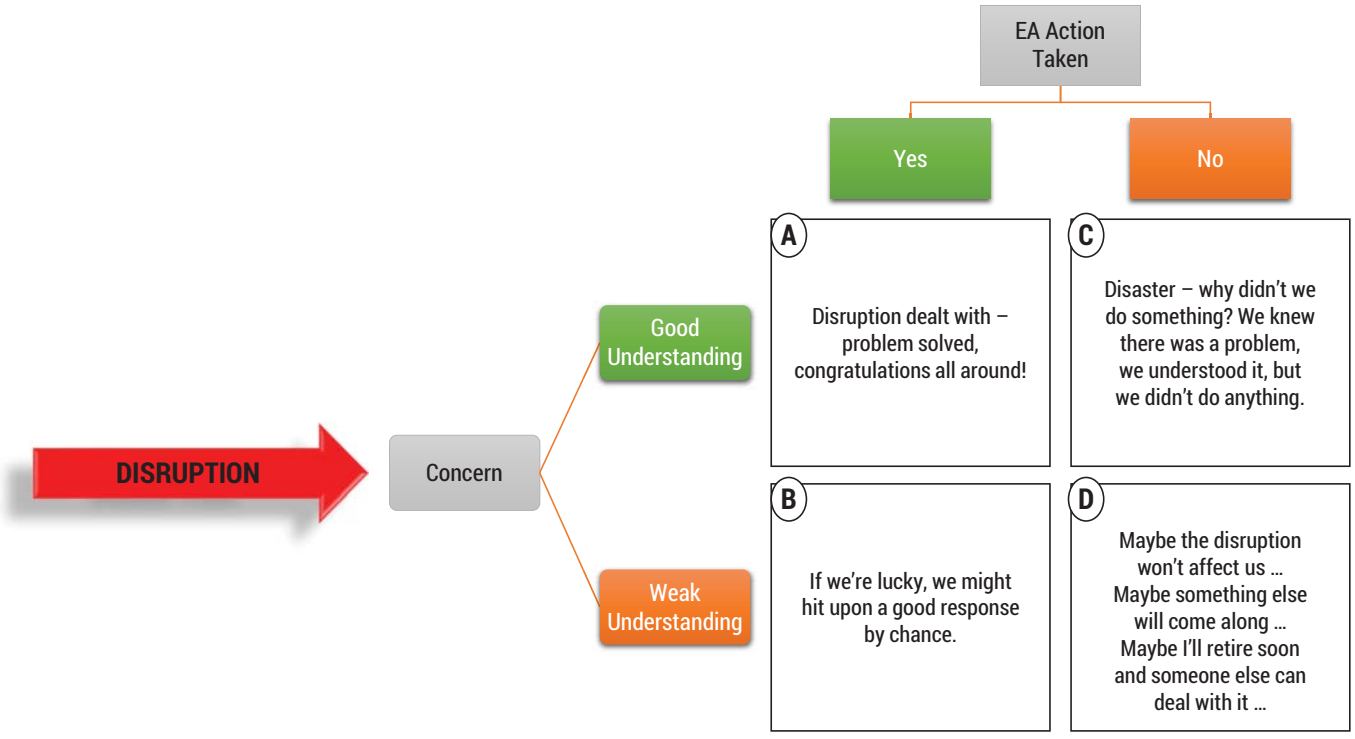

Figure 2 — Options for an EA response to disruption.

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we take are an unmitigated disaster, but this is unlikely. The fact that we acted puts us in a stronger position to deal with digital disruption, and this is particularly so if the EA team is prepared to continue updating their plan based on monitoring its results. The best way to avoid the risk of a bad outcome is to improve our architectural understanding and shift our position to the A quadrant. In any case, Options A and B are both better than C and D. The British retailer WHSmith, unlike Waterstones, took a different response to the digital threat — it introduced a subtle change to the nature of its business by focusing on new outlets in railway stations, airports, hospitals, and motorway service stations. WHSmith recognized the growing demand for books, stationery, magazines, entertainment, and refreshments by people who are traveling. While WHSmith has an online presence, it didn't choose a direct response in the same way as Waterstones.

- **Option C: Good understanding, no action taken.** A good understanding of digital disruption, or any other form of disruption, will show that there is a high risk and that we need to respond. If we have a good understanding of digital disruption but we don't do anything about it, then we probably deserve the consequences! There are countless examples of book retailers (e.g., Borders, Atlantic Books) that failed to respond to the digital threat of online sellers such as Amazon.
- **Option D: Weak understanding, no action taken.** If we don't have a good understanding of the issues and we don't do anything, then maybe all it shows is that we don't really care — we consider other things to be more important.

For an enterprise architect, the key point is to understand digital disruption as well as you can and plan the best possible response given this understanding. As Craven discovered when he studied global warming, it doesn't really matter whether disruption from digital is likely or not. What matters is that action is always better than inaction.

Conclusion

I am certainly convinced that digital technologies, products, and services are different to physical ones. From an EA perspective, the structure, properties, characteristics, and behavior of digital components are fertile with innovative EA options. When these emerging configurations are married to creative, fresh, and original business models, we can expect to see radically different future architectures.

In some cases, introducing a new type of component into your architecture is enough to make a difference; for example, introducing a new digital distribution or communications channel to complement existing brick-and-mortar outlets. Another type of change that can have a big impact is reconfiguring components in the architecture. Many banks and financial institutions have adopted this approach as a way to make their products, most of which are digital in nature, more flexible and adaptive. For example, instead of having multiple processes to open an account, the architecture might be changed to have one process for account opening that is parameterized to cover all types of products.

It doesn't really matter whether disruption from digital is likely or not. What matters is that action is always better than inaction.

The most powerful type of architectural change is to create a new type of pattern. When you have created a new pattern, it can be applied in many different ways. For example, the idea of a standard Open Account process, parameterized to cover all types of banking products and with externalized business rules, is now a well-established pattern in enterprise architecture. What started as an idea in the financial services industry is now a staple in many other contexts, enabling the reuse of common systems across multiple enterprises or core services across many capabilities.

Digital disruption does not have to be harmful to your enterprise architecture. What matters most is how the EA team and decision makers respond to this challenge. Burying your architectural head in the sand and pretending that there will be no impact on current business models is the worst option. The best bet would be to reevaluate EA strategies and plans with a good understanding of the potential changes that digital (and other change drivers) will bring to our business models and to the social, economic, and political systems that form our world.

Endnotes

[1]Burgess, Matt. "What Is the Internet of Things? WIRED Explains." *WIRED*, 21 April 2107 (www.wired.co.uk/article/internet-of-things-what-is-explained-iot).

[2]Doctorow, Cory. "Copyright Isn't Dead Just Because We're Not Willing to Let It Regulate Us." *The Guardian*, 23 March 2012 (www.theguardian.com/technology/2012/mar/23/copyright-regulate-us).

[3]"10 Most Important Cities in the World." TopTenz, 15 May 2017 (www.toptenz.net/10-important-cities-world.php#.WXsKomjyvIU).

[4]Runciman, David. "Postcapitalism by Paul Mason Review — A Worthy Successor to Marx?" *The Guardian*, 15 August 2015 (www.theguardian.com/books/2015/aug/15/post-capitalism-by-paul-mason-review-worthy-successor-to-marx).

[5]Strawson, Galen. "Sapiens: A Brief History of Humankind by Yuval Noah Harari — Review." *The Guardian*, 11 September 2014 (www.theguardian.com/books/2014/sep/11/sapiens-brief-history-humankind-yuval-noah-harari-review).

[6]Gray, John. "The Future by Al Gore — Review." *The Guardian*, 31 January 2013 (www.theguardian.com/books/2013/jan/31/the-future-al-gore-review).

[7]If you want to know more about the idea of architectural thinking, I have produced a free online course that explains it (www.evernden.net/free-online-course-on-architectural-thinking/).

[8]Mooney, Chris. "Review: *What's the Worst That Could Happen?* by Greg Craven." *New Scientist*, 1 July 2009 (www.newscientist.com/article/mg20327151-800-review-whats-the-worst-that-could-happen-by-greg-craven/).

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As architect of the Information FrameWork (IFW), Mr. Evernden pioneered many contemporary techniques, including the use of industry reference models, business capability analysis, and component-based building blocks. His work has been the basis for more than 400 business and IT architecture initiatives worldwide. Past clients include Alcatel-Lucent, Allied Irish Banks, AstraZeneca, Bancomer, Bank Austria, Barclays, Credit Suisse, DnB NOR, HSBC, IBM, ING, Lombard, Lloyds Banking Group, Microsoft, National Australia Bank, and Westpac. Mr. Evernden has written articles appearing in major publications and books, including the seminal article on IFW in IBM Systems Journal. *He is the author of two books about EA:* Enterprise Architecture — The Eight Fundamental Factors *and* 101 Lessons from Enterprise Architecture. *He can be reached at revernden@cutter.com.*

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Pull Together or Fall Apart: Startup Culture and EA Adoption

by Kaine Ugwu

Introducing an enterprise architecture (EA) that enables digital business strategies poses challenges for startups. In this article, I discuss how a startup's culture plays a part in overcoming these difficulties, outline the steps involved in adopting an EA framework, and show how implementing an EA practice can help such businesses evolve.

Of Startups and Strategy

Startup culture focuses on time to market and business agility. The perception is that time to market is vital to staying competitive, and founders are usually so busy formulating their business and product strategies that they do not pay attention to aligning their culture to the vision. This disconnect often leads to an inability to execute on such strategies because behaviors are the enablers of the strategies and are required for any change initiative to be successful. Without shared values, beliefs, and teamwork, people cannot come together to execute strategic objectives. Enterprise architecture defines the process needed to align the culture with the strategy. Establishing an EA capability within a startup ensures that, through its culture, people, and processes, the organization can implement its formulated strategy.

So how can you execute on a strategy that ensures that your startup will survive in five years? An effective strategy will promote innovation while ensuring coherence across the enterprise. Founders and executives often realize the need for standardized processes to achieve this unity and company maturity later on. But an EA can provide this standardization and value if founders integrate it as part of their firm's culture from the outset. This involves organizational design, which must jibe with the core values that define the business vision. Such integration could be the difference between being a successful company or a failed startup five years down the road.

Startup Culture and Enterprise Architecture

It all starts with the culture. Organizational culture includes an organization's expectations, experiences, philosophy, and the values that hold it together; it is manifested in its self-image, operations, synergies with the outside world, and future expectations. It is based on shared attitudes, beliefs, customs, and written and unwritten rules that have been developed over time and are considered valid.[1] Simply put, culture is the way a group collectively functions. Company culture affects everything: the way the company hires its staff, the way the company runs its operations and relates to its customers, as well as the architecture of the organization. The culture has to support innovation and structure at the same time, which is why establishing the right culture for your line of business is so important.

Enterprise architecture defines the process needed to align the culture with the strategy.

The culture of a company is often a representation of the founders' personalities. It comes from the hearts of the founders. For example, if the founders are technologists, the company will value information technology first. If the founders are from a sales background, the company culture will be customer-oriented, and the core values and vision will focus on customer satisfaction. The problem is that many startup founders fail to define their culture, and this negatively affects the way their business operates.

A company's culture may consist of three key elements:

- **The company's shared values.** Mission statements define a company's core purpose or cause. These are the values the company publicly proclaims about the way it should be perceived. Consider Amazon's mission statement: "Our vision is to be earth's most customer-centric company; to build a place where people can come to find and discover anything they might want to buy online."[2] A great mission statement such as Amazon's has to be strategic and well thought out, as it must drive the staff toward a common company goal, guide decision making, and

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inform the company's stakeholders of its plans to achieve the stated target.

- **The organization's architectural artifacts.** Architectural artifacts are the defined views of the organization. These views could include definitions about the business model, organizational structure, stakeholders, business functions, geographical sites of the company, product portfolio, and systems.
- **The company's assumptions.** The artifacts may be tangible, but the assumptions are intangible and determine how your staff views organizational structure. London Business School Professor Michael Jacobides describes assumptions as the viewing glass or perspective through which individuals see their organization and its environment.[3] These are the most difficult to change, and the company's shared values and artifacts should be aligned with these assumptions to craft an ideal culture that wins.

The pace of digital innovation in our era is unprecedented, and the ability of startups to survive involves changing the way they architect their organizations.

In its early stages, the culture of a startup may permit it to create a PHP site from scratch within a few hours and ship it to production that same day. As the startup matures, however, the business realities become glaring. A typical startup may raise initial funding based on its ability to create a great product or service and attract the customers that generate revenue. However, the next round of financing usually materializes only if the startup sustains that income. This is when startups start considering scaling up and growing their architecture capability. Before this stage, many startups don't consider EA mostly because they are still lean and lack the funds required to establish the function formally.

In some cases, if a startup becomes successful, the EA that got it to that stage can't take it further because the architecture is not scalable and the enterprise views are nonexistent. Amazon's service-oriented platform is an example of this. In 2001, Amazon began a transformation of its architecture that enabled it to move from a two-tier monolithic application to a fully distributed, decentralized services platform using the service-oriented architecture pattern. Over time, this grew into hundreds of services, which today make up part of its public Amazon Web Services. Adopting a services model required a culture shift and a lot of innovation. Each service has a team associated with it, and that team is entirely responsible for the service. This approach enabled Amazon teams to adopt an innovative culture with a strong customer focus, ultimately aligning the company's technology with its business strategy.[4]

Similarly, as companies develop and the hurdles of the external environment become more complex, business processes, structures, and workflows that worked in the past may become barriers to productivity, customer service, employee morale, and financial profitability. Organizations that don't periodically refresh themselves suffer from inefficient workflows and lack of growth. "Kaizen" is a Japanese term that refers to a long-term approach that systematically seeks to improve operational efficiency and quality by continuously applying small incremental changes to processes. Companies like Amazon use kaizen to identify waste and continually improve their processes,[5] thereby maintaining their competitive advantage in the market.

EA Adoption

Like kaizen, enterprise architecture can be a driver for process improvement. EA is a step-by-step methodology that recognizes flawed aspects of a company's processes, structures, and systems; realigns them to match current business realities or goals; and then develops roadmaps to implement the new changes. For most companies, EA leads to a more efficient organization, significantly improved results, optimized processes, profitability, and employees who are empowered and committed to the business. In other words, an ideal culture. Today, creating the ideal culture requires startups to digitize their business models. The pace of digital innovation in our era is unprecedented, and the ability of startups to survive involves changing the way they architect their organizations.

By "architect," I'm talking about how to integrate people with core business processes, technology, and systems. A well-architected organization ensures that the form of the organization matches its purpose or strategy, meets the challenges posed by market forces, and considerably increases the likelihood that its teams will synergize successfully. Design-driven approaches are intended to define leading EA practices. For example, the renowned digital disruptor Airbnb uses design-driven approaches such as design thinking to build and evolve its platforms.[6]

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Applying an EA Framework

Any business that wants to build highly scalable and interoperable systems should consider adopting a formal EA framework. There are EA frameworks that consist of best practices and expert guidance derived from the experience and research of industry bodies. One such framework developed by The Open Group, the TOGAF Architecture Development Method (ADM), is the result of continuous contributions from a large number of architecture practitioners. It describes a method for developing and managing the lifecycle of an enterprise architecture.[7] Be aware that startups do not need to implement these frameworks to the letter. In fact, TOGAF ADM advises that the framework be tailored to suit the organization's specific needs.

There are no silver bullets to adopting an enterprise architecture in your startup, but the aim is to enable your culture to accept it so as to drive the organization's digital transformation. You can do this by simplifying your architecture and focusing on the core aspects of the framework alone. The suggested steps include:

1. **Building an architecture repository.** The architecture repository allows a startup to identify the various architectural assets and artifacts that exist at different levels of abstraction within the company. It forms part of the wider enterprise repository, which provides the capability to link architectural assets to components of the detailed design, deployment, and service management repositories.[8] In essence, the architecture repository is just a place to document and store your architecture with versioning and change logs.
2. **Defining your architecture principles.** Architecture is the fundamental organization of a system and the principles governing its design and evolution.[9] These principles are the foundation of your enterprise architecture. They must enable the business to achieve its strategy and at the same time be simple, consistent, flexible, and useful to fit into the company's culture. You must be careful when defining these principles, as they guide decisions within your organization, and therefore one bad principle can lead to a lot of bad architectural decisions.
3. **Describing the business.** Another important step is to describe your business and what it involves. What are your business vision and business strategy? What business category closely matches your business? What problem are you trying to solve? The enterprise architects must be familiar with the business principles laid out by the founders that guide the business operations. They must know how the business operates and what constitutes best practice in that industry sector.
4. **Defining the architecture vision.** An architecture vision enables the business goals, responds to the strategic drivers, conforms with the principles, and addresses the stakeholder concerns and objectives. Here is where you create enterprise views of the architecture and pitch the vision to all relevant stakeholders to ensure adoption. The views should be high-level, nontechnical, and focused on the transition architectures and iterations between the as-is and to-be architectures.

There are no silver bullets to adopting an enterprise architecture in your startup, but the aim is to enable your culture to accept it so as to drive the organization's digital transformation.

5. **Creating, customizing, and storing your architectural building blocks.** Architecture building blocks are packages of functionality defined to meet the business needs across an organization. They should map to the business policies and be interoperable with other building blocks. Each building block, irrespective of the domain (business, data, application, or technology), should be documented. This means keeping track of all applications, business processes, and online services that are in use within your startup. This becomes very important when making a digital threat or risk analysis, doing cost optimization, determining service-level agreements, monitoring, aligning your architecture to business processes for business continuity, and so on.
6. **Implementing change initiatives.** Evolving and remaining a disruptor means implementing change initiatives that conform to your defined architecture principles. Using the TOGAF ADM, you can quickly implement change initiatives across your organization. I recommend startups use an EA tool to keep track of their architecture. Archi is a free and open-source enterprise architecture tool that startups can use to maintain their EA in its early stage.[10]

Adopting an enterprise architecture function into your culture will help:

- **Align the organization to the strategy and realize value.** Enterprise architects ensure the architecture focuses the business leadership on the strategic superiorities and vital operations of each business unit.
- **Allow collaboration across business units.** Achieving large-scale collaboration across the entire enterprise in different areas like customer solutions, product development, and innovation can unlock tremendous value.
- **Foster responsibility.** Through careful design of performance management processes, enterprise architects make sure all units have clear performance measures.
- **Simplify your business.** A well-architected enterprise removes the complexity that creates unnecessary cost and organizational friction.

Conclusion

Startup founders are frequently discouraged at the slow pace of achieving EA initiatives because the perception is that enterprise architecture is a strategic discipline that takes years to provide value. Funding these efforts is also a challenge. However, the success and immediate benefits that can be realized from an EA depend heavily on the organizational culture of the startup. The way culture is understood and crafted can either make or break the EA practice within an organization and, in essence, determine whether the startup will be successful or not.

Endnotes

[1]"Organizational culture." BusinessDictionary.com (www.businessdictionary.com/definition/organizational-culture.html).

[2]Hull, Patrick. "Be Visionary. Thing Big." *Forbes*, 19 December 2012 (www.forbes.com/sites/patrickhull/2012/12/19/be-visionary-think-big/).

[3]Jacobides, Michael G. "The Inherent Limits of Organizational Structure and the Unfulfilled Role of Hierarchy: Lessons from a Near-War." *Organization Science*, Vol. 18, No. 3, May-June 2007 (http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.333.9211&rep=rep1&type=pdf).

[4]"A Conversation with Werner Vogels." Interview by Jim Gray. *ACM Queue*, Vol. 4, No. 4, 30 June 2006 (http://queue.acm.org/detail.cfm?id=1142065).

[5]"Kaizen." Amazon (www.amazon.com/p/feature/7vgnru22nddw5jn).

[6]Gebbia, Joe. "Design Thinking: How Design Thinking Transformed Airbnb." TedEd (https://ed.ted.com/on/6eRFqkxE).

[7]"Introduction: ADM Overview." TOGAF 9.1 Specification. The Open Group (http://pubs.opengroup.org/architecture/togaf9-doc/arch/chap05.html).

[8]"Architecture Repository: Overview." TOGAF 9.1 Specification. The Open Group (http://pubs.opengroup.org/architecture/togaf9-doc/arch/chap41.html).

[9]"Defining *architecture*. Systems and software engineering — Architecture description." ISO/IEC/IEEE 42010 (www.iso-architecture.org/ieee-1471/defining-architecture.html).

[10]Archi (www.archimatetool.com).

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In this one-day, highly interactive workshop, Cutter Senior Consultant Whynde Kuehn educates attendees on how to establish and mature all aspects of a business architecture practice, such as defining value proposition and measuring value, creating a roadmap for the practice, defining governance, selecting tools and defining organizational structures.

Business Architecture Immersion

This workshop, led by Cutter Felllow William Ulrich or Cutter Senior Consultant Whynde Kuehn, provides your organization with an industry-proven approach to a comprehensive business architecture. You'll gain an overview of foundational concepts, the business architecture framework, value proposition, governance, blueprint creation, interdisciplinary alignment and practice setup. This workshop benefits practitioners and managers, ranging from novices to experts. At the end of this workshop, you and your team will be positioned to take on a wide range of business architecture tasks and challenges.

Extending the Business Architecture: From Strategy to Execution

This course focuses on the concepts and skills needed to leverage a new business architecture for strategic planning, business design efforts, project deployment, and governance. Attendees will learn how to extend the basic business architecture through strategy, product, initiative and stakeholder mapping. You'll learn how to deploy a business architecture

that benefits related disciplines including business modeling, Lean Six Sigma, business process management and case management.

Business Architecture / IT Architecture Alignment

This workshop discusses how to establish and map formal blueprints of your business and IT architectures and use these blueprints to interpret strategy, craft roadmaps, allocate funding and establish and govern project deployments. You'll leverage the Business/IT Architecture Transformation Framework™ and its approach to business-driven, IT architecture transformation and draw upon state-of-the-practice work by a number of organizations.

Enterprise Architecture

Enterprise Architecture Assessment

Through a qualitative and quantitative evaluation of your architecture and organization, Cutter's maturity assessment provides a relative comparison of the organization to industry norms and identifies strengths and areas needing attention. The engagement includes a report summarizing the maturity assessment process; the level of maturity of your organization; strengths, weaknesses, and recommendations; and the roadmap for architecture to deliver value and meet the enterprise goals.

Enterprise Architecture Foundations

During this four-day course, Roger Evernden will cover all of the key enterprise architecture techniques, including background and theory, and focus on developing your skills and experience through demonstrations and exercises. You'll quickly master the techniques, and then apply them to deliver the outcomes and results that your enterprise wants. The concentration is on the essential elements required to deliver results-driven EA programs. The course clearly explains everything through real-life case studies, interactive exercises, worked examples, and demonstrations.

Architecture Review and Action Plan

Gain an in-depth evaluation of your firm's architecture through an approach that clarifies your business, application, and technology concerns so that you can make specific technology decisions. By analyzing the enterprise architecture and infrastructure that will be required to meet your objectives, whether they involve an EA, an organizational transition, or the implementation of a single application using architecture-focused development techniques, this approach articulates the business, technology, and development goals as well as the architectural requirements implied by these goals. And it highlights technical issues that might impede achievement of these requirements and goals.

Additional Domains

Architecture for the Cloud

The cloud is here. Cutter's team will help ensure your architecture defines how to use it to add value, not risk, to your enterprise. In this engagement, Cutter will help architect your enterprise for the cloud, and address the entire range of issues including integration, semantics, security, data integrity, reliability, and DR/BCP. Plus, we'll help you create a framework that includes accountability and responsibility to govern cloud adoption.

Measuring Alignment in Agile Architecture

Business architecture provides the broad starting point for the enterprise architecture (EA) process, and contains the whys, whens, and whats of the business strategy and its impact on IT. One of EA's most important but elusive goals is to "align business and IT." This seminar, created by Jim Watson, demystifies business-IT alignment by looking at how alignment can be practically measured in IT systems and the EA program. You'll consider the EA program as a business function, and its need for measurements to assess success and value.

Mastering Business Analysis

Developed by Bhuvan Unhelkar, this three-day course will help you anticipate and analyze business needs at the organizational level before project-level requirements modeling activities begin. You'll learn how to identify core business opportunities, understand needs and challenges; undertake changes in project situations; get to the root cause of problems; model functional and non-functional requirements; and operate in an Agile project environment. You'll ensure your systems meet your core business needs, are top quality, and that your outsourced contracts, turnkey projects, and Agile performances are improved.

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From the design and development of individual applications to enterprise network architecture, Cutter's approach is to make security an integral part of the finished product, ensure it is cost-effective and acceptable to your employees, and that it differentiates your products from those of your competition. We can provide services ranging from a brief design review to expose any problems with technology, implementability, scalability, and manageability to the in-depth design of secure web-to-database integration projects, authentication and access control systems.

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