

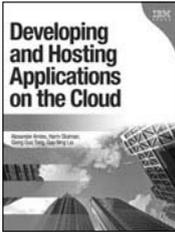
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Choosing the Best
Cloud Adoption Strategy
for Your Business



Pamela K. Isom and Kerrie Holley

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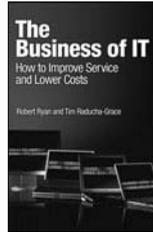


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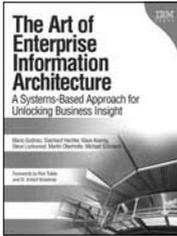
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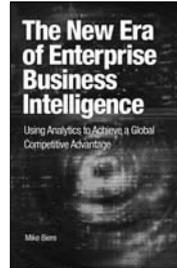
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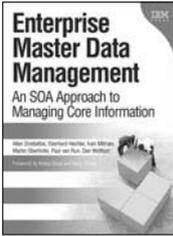
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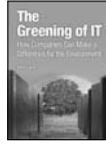
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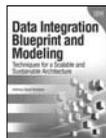


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Pamela K. Isom
Kerrie Holley

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This book is dedicated to our soldiers of war and peace and our special forces;

I cannot imagine life without your support, your courage, your strategic thinking, and steady intervention.

To the military families, thank you for your strength.

I am sending a special shout out to the Vietnam veterans; thank you for what you have done and continue to do for me and our nation; you are loved, most appreciated, and always, always remembered.

Contents

Chapter 1	■	Business Value of a Cloud Adoption Strategy	1
		Ten Expectations of Your Cloud Adoption Strategy	2
		1. <i>Create Your Cloud Vision</i>	4
		2. <i>Identify Cloud Use Cases</i>	10
		3. <i>Drive Business Innovation</i>	12
		4. <i>Define Business Outcomes and Projected ROI</i>	13
		5. <i>Determine Opportunities for Cloud as a Fifth Utility</i>	15
		6. <i>Specify Cloud Ecosystem</i>	17
		7. <i>Determine and Publish Stakeholder Involvement</i>	18
		8. <i>Develop Metrics</i>	19
		9. <i>Define Governance</i>	20
		10. <i>Develop Roadmaps</i>	20
		Harvesting the Value	21
		Summary	22
		Endnotes	23
Chapter 2	■	Business Value of Incorporating Cloud into Your EA	25
		Your Integrated Business and IT Strategy	26
		Business Benefits of the Convergence	29
		Developing Your Enterprise Cloud Adoption Strategy	35
		What If You Do Not Use EA?	39
		<i>Scenario 1: Effective Business Transformation</i>	40
		<i>Scenario 2: Reducing Costs and Redundancies</i>	41
		<i>Scenario 3: Validating and Forming Your Enterprise Cloud Adoption Strategy</i>	41

	Summary	42
	Endnotes	43
Chapter 3	■ The Life Cycle of Your Enterprise Cloud Adoption Strategy ..	45
	Initial Planning	46
	Enterprise Capabilities and Cloud Vision	49
	Target Architecture and Cloud Enablers	61
	<i>Business Architecture (BA) and</i>	
	<i>Business-Process-as-a-Service (BPaaS)</i>	62
	<i>Information Systems and SaaS</i>	68
	<i>Technology and Infrastructure, PaaS and IaaS</i>	75
	Gap Analysis and Transition Planning	78
	Implementation Planning	81
	Governance	82
	The Significance of Service Oriented	
	Architecture (SOA)	83
	Standards	84
	Summary	85
	Endnotes	88
Chapter 4	■ Identifying Cloud Candidates	89
	Your Cloud Decision Model	90
	<i>Top-Down Analysis</i>	91
	<i>Bottom-Up Analysis</i>	95
	Cloud Discovery Workshop	96
	Business Scenario: Cloud Decision Analysis	
	for Distributors, Inc.	97
	Summary	100
	Endnotes	101
Chapter 5	■ What About Governance?	103
	Governance Is Essential for Cloud	104
	An Enterprise Cloud Governance Framework	105
	<i>Principles and Policies</i>	106
	<i>Organizational Structure</i>	107
	<i>Financials</i>	112

	<i>Processes</i>	112
	<i>Metrics and Tools</i>	115
	Establishing Ownership	116
	Governing in the Presence of Outsourcing	118
	Governing Cloud Service Brokers	120
	Governing Innovation	123
	Business Scenario: Innovation and Cloud Provider Company	125
	Summary	128
	Endnotes	130
Chapter 6	■ Mitigating Risk	133
	Cloud Risk Management and Response Strategies	133
	Enterprise Adaptation	137
	<i>How Do We Select Cloud Providers That Are Conducive to Our Business Strategy?</i>	138
	<i>What If We Are Not Equipped to Make Sound Cloud Computing Choices?</i>	142
	<i>How Do We Mitigate the Risk of Stakeholder Rejection?</i>	143
	Information Privacy and Transparency: Striking the Right Balance	146
	Service Level Management (SLM)	149
	Performance and Quality of Service	153
	Globalization	156
	Summary	157
	Endnotes	159
Chapter 7	■ Planning the Transition	161
	Relating Transition and Implementation Planning	161
	The Business of Cloud	163
	<i>Self-Service</i>	165
	<i>Speed, Rapid Development, and Service Delivery</i>	165
	<i>Flexible Pricing, Pay Per Use</i>	168
	<i>Café-Style Services</i>	169
	<i>Leaner</i>	169

	Practical Experiences and Lessons Learned	171
	<i>Proof of Concepts and Pilot Programs</i>	171
	<i>Organizational Change</i>	171
	<i>Workload Considerations</i>	176
	<i>Outsourcing Considerations</i>	177
	<i>Buyer and Seller Considerations</i>	178
	<i>Test Strategy Considerations</i>	180
	Enterprise Cloud Transition Plans and Roadmap	
	Examples	180
	Summary	183
	Endnotes	184
Chapter 8	■ Financial Considerations	185
	Communicating the Financial Benefits and Implications	186
	<i>Managing Your Money</i>	189
	<i>Do Opportunity Costs Matter?</i>	195
	<i>Cloud Workloads and Business Profitability</i>	195
	<i>Key ROI Metrics and Business Agility Indicators</i>	199
	<i>Time Value of Money (TVM) and Net Present Value (NPV)</i>	200
	Business Scenario: Brand, Inc.	201
	Summary	204
	Endnotes	205
Epilogue	■ Thinking Beyond the Race	207
Appendix A	■ Augmenting Your Delivery Model with Cloud	243
Appendix B	■ Cloud Case Studies and Common Questions	267
Appendix C	■ More on Cloud Business Trends	299
	Glossary	311
	Index	331

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—Pamela Isom

I want to acknowledge my two sons for their spirit and love: To my oldest son, Kier Holley, for his maturity, kindness, intellect, kindred spirit, and paving a road that always reminds me that the future is bright. As a freshman in high school, he is beginning to build his future, and I am quite proud of him. Quiet in disposition, always thinking, he will be brilliant at whatever he decides to do in life. I love him dearly and watching him expand his horizons is pure pleasure. His love of mathematics, science, and the arts is most excellent.

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Finally to Sue Duncan, founder of the Susan Duncan Children’s Center, for creating a world I could live in as a child and making the road I travel today possible.

—Kerrie Holley

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Pamela K. Isom is an executive architect in IBM® Global Business Services® and a chief architect of Complex Cloud Integration and Enterprise Application Delivery in the Application Innovation Services, Cloud Solutions Practice. She is a member of the IBM Academy of Technology where she leads initiatives on smarter cities and cloud computing in highly regulated environments. On the client front, Pamela leads complex cloud adoption, gamification, and integration projects as well as initiatives that attribute to a greener, cleaner environment. Her passion is helping clients develop cloud product and implementation strategies and establish partnered relationships so that the adoption of cloud solutions are optimized. She looks across the enterprise and thinks end-to-end when it comes to cloud adoption. She works with all stakeholders from the CEO to delivery practitioners where her ultimate strength is driving client value. In addition, Pamela is a leader of SOA and enterprise architecture. Within IBM Pamela manages the GBS patent board where she has filed and received issuance of patents with the U. S. Patent Attorney's office.

Externally, Pamela is a graduate of Walden University where she is an active alumni and plans to teach other students; she is an active member of IEEE, The Society of Women Engineers (SWE), The Open Group™ where she represents the cloud steering committee and leads the Cloud Business Use Case (CBUC) team, TMForum, the National Society of Black Engineers (NSBE), The American Legion where she and her husband connect with and support the military and their families, and Pamela is a frequent speaker at global, industrywide conferences. Pamela is a two time recipient of the Black Engineer of the Year Award for Modern Day Technology Leaders and a contributor to numerous

publications on *Intelligent Enterprise Architecture*, *Smarter Buildings*, and *Maximizing the Value of Cloud for Small-Medium-Enterprises, an Open Group Guide*; and she is a key contributor to three books: *The Greening of IT* by John Lamb, also an IBM cloud offering, *SOA 100 Questions Asked and Answered* by Kerrie Holley and Ali Arsanjani, and *Cloud Computing for Business* by The Open Group where she also resided on the editorial board.

Kerrie Holley, IBM Fellow, is the global CTO for application innovation services in IBM's Global Business Services (GBS). His responsibilities include technical leadership, oversight, and strategy development, consulting, and software architecture for a portfolio of projects around the world. He also provides technical leadership for IBM's SOA's and Center of Excellence.

IBM's CEO in 2006 appointed Kerrie to Fellow, IBM's highest technical leadership position. It is the highest honor a scientist, engineer, or programmer at IBM (and perhaps in the industry) can achieve. Thomas J. Watson, Jr., as a way to promote creativity among the company's "most exceptional" technical professionals, founded the Fellows program in 1962. Since 1963, 238 IBM Fellows have been appointed; of these, 77 are active employees. The IBM Technical Community numbers more than 200,000 people, including 560 Distinguished Engineers.

IBM Fellows have invented some of the industry's most useful and profitably applied technologies. Few computer users may realize how much of this group's innovations have created the computer technology we take for granted.

Mr. Holley's expertise centers on software engineering, software architecture, application development, business architecture, technical strategy, enterprise architecture, service-oriented architecture, cloud computing, and cutting-edge network-distributed solutions.

Mr. Holley is an IBM master inventor, and holds several patents.

Mr. Holley has a BA in mathematics from DePaul University and a Juris Doctorate degree from DePaul School of Law.

Preface

Written by Pamela K. Isom, Executive Architect, IBM

While numerous books in the market describe implementation details of cloud computing, this book emphasizes the need for a cloud adoption strategy offering guidance on cloud investment decision making as well as how to evolve your strategy so that it remains relevant during changing business conditions.

We have had the pleasure of working with companies that are business-centric when it comes to cloud decision making as well as those that are more technology-centric. The business-centric consumer tends to focus on ensuring that cloud investments will strengthen the company's presence in the marketplace; these companies are concerned with establishing the right business portfolio that encompasses cloud and understanding the buying behaviors of targeted consumers. The technology-centric consumer on the other hand tends to lean on cloud services to build up IT capability and improve business performance. In both cases increasing profitability and agility are at the forefront of business objectives.

When it comes to developing your cloud adoption strategy a mixed business and technical strategy is significant, and that is why we wrote this book—to share experiences and insights on how to integrate business and information technology (IT) decision points as well as offer holistic, companywide considerations in an effort to guide development of an effective strategy that generates sustainable business outcomes! Written from a cloud consumer's point of view, this book offers cloud service providers insight into how to motivate consumption of their cloud services, while both consumers and providers will learn how to go about developing an effective cloud adoption strategy tailored for their business.

Business Influence and Cloud

Having 25 plus years of experience in IT, I have worked with a vast array of executives, business leaders, and practitioners from small, midrange, and large companies that face challenges of varying degrees. I enjoy working with clients, and I really enjoy getting to know the teams so that we solve business problems together and in such a way that identified changes are actionable and easier to embrace. Examples include ensuring that adequate sourcing strategies are understood and put in place within organizations, as well as ensuring that appropriate business technologies are adopted for the right business reasons.

In general, most client business drivers fall into two main categories. First, change to improve business performance. This may as an example involve offering guidance on how to expand global business operations or conduct process improvements. Second, improving efficiencies, which often translates to reducing the costs of conducting business. This typically involves streamlining business as well as IT costs while maximizing service efficiencies. The magnitude of these drivers has bubbled up and down over the years. For instance, both the dot-com and the 2007 economic experiences were prefaced with optimistic spending followed by stringent cutbacks. Now considering the economic recovery, businesses are promoting cautious spending while investing in established capital using strategies such as outsourcing, business partnering, and there is a notable increase in mergers and acquisitions (M&A) to strengthen business portfolios.

In fact, the economic bubble (although unpleasant at times) attributes in many aspects to innovation. I mean think about it; business today is conducted over the Internet using more cost-effective and efficient capabilities such as AppStore services; the use of social collaboration or “social-ware” is more profound in business decision making; mobile technologies have been around but global growth and consumption patterns continue to expand; and cloud computing—or “cloud” for short—is becoming more prevalent for providing core, not just minor, business competencies.

Cloud in Context

Most businesses have heard the term cloud and understand it to mean a business service model that enables consumption and delivery of business and IT services on a “pay for what you use” basis. This capability is enabled through subscription or flat rate service charges, similar to the rates you pay for mobile use or magazine subscriptions, and consumption-based pricing or metered charges, which are more exact charges or up to the minute. Purchasing services in the cloud allows you to invest in assets that are off-premise as opposed to investing in-house. In general, it is less expensive and more efficient to purchase cloud solutions off-premise than it is to outright buy assets that you may or may not use, or build the capability internally. Private clouds are different in that you own the assets so there may be some up-front costs, but there are tangible benefits due to ready-made solutions, economies of scale, and again consumption-based pricing. That being said, you probably are not surprised that the adoption of cloud makes for a compelling business case. Many companies for instance are concerned that their IT staff has been spread pretty thin over the past years and would benefit from “ready-made” solutions that are available in the cloud. Cloud delivery models, although necessary to understand, are not as interesting as understanding the business innovation and opportunities presented with the adoption of cloud computing.

Why the Strategic Emphasis?

I certainly agree with the benefits of cloud and support the use wholeheartedly, but I also believe that you can get even more out of your cloud investments if you strategically position and ready your company for cloud. To me, and this may have to do with my upbringing in athletics, strategy is your combined vision and playbook. You must have a vision, one that others can imagine and embrace, and you have to execute the right plays to attain your vision. In addition, you must evolve your strategy to grow and remain competitive, especially considering that a cloud adoption strategy today requires market analysis and agility to remain effective tomorrow. To prepare for cloud adoption, you might specifically require the immediate discipline of portfolio management and governance at executive levels so that good decision making and

exception handling practices are carried forward into adoption decisions; you may need to strategize business patterns for adoption that include development of a diversified cloud portfolio or stronger business partnerships so that you contain business risk; you might choose to broaden the marketing depth of your CTO so that you, as a company, are more business savvy when it comes to ideation and propelling the use of cloud across your value net; or quite frankly, you might decide to focus on building internal assurances so that members of your highly regulated vertical organization (e.g., healthcare) are trained on compliance procedures and can apply these requirements to guide cloud adoption choices.

Whatever your situation, you need to sharpen your readiness for cloud by developing a strategy that embraces change so that you effectively perform now and in the future. In essence, it is not about the adoption; it is how you strategically plan, grow, execute, and maintain the adoption of cloud in your company. One thing is for certain, and you hear this as you read: There is so much more to cloud than technology.

One way to ready your company for cloud is to incorporate cloud into your enterprise architecture (EA)—your integrated business and IT strategy. To provide some context, there are three dimensions of EA: strategy (which is the focus of this book), management and control, and execution. There are numerous ways to depict an EA, and essentially there are four domains: business architecture, information systems architecture (which are applications and data), technology/infrastructure architecture, and governance. Definitions of each domain are provided in the glossary. As you contemplate your decision to adopt cloud, albeit now or in the future, you should consider each domain and incorporate cloud considerations for two primary reasons. First, the value of cloud continues to generate a compelling business case for small and large companies, and as such it is never too soon to begin preparations; and second when you think about the domains it is important to understand that each can be outsourced in its entirety or in part to cloud and therefore strategic consideration is prudent and will make your transition that much smoother. Suppose you are interested in consuming SaaS (Software-as-a-Service) collaboration services because you feel that developing applications internally is too costly and simply not worth the investment at a given point in time. The question emerges: What are some key business considerations for SaaS adoption in your company? For example, are you prepared to intertwine your SaaS applications with your current business processes and applications, and are others willing

and ready to embrace the required changes? The magnitude of adoption of course depends on your business needs, and you learn as you read that sometimes cloud is not the right fit or course corrections are needed to sustain the adoption.

One of the central messages in this book is the need to create an enterprise cloud adoption strategy; one that is reusable and positions you to make sound choices. Figure P.1 illustrates the life cycle of an enterprise cloud adoption strategy that commences with initial planning and concludes with implementation planning ensuring that there is a smooth transition from strategy to project delivery. As you read, you find the topics expounded throughout this book with expressed focus on the cloud adoption life cycle in Chapter 3, “The Life Cycle of Your Enterprise Cloud Adoption Strategy.”

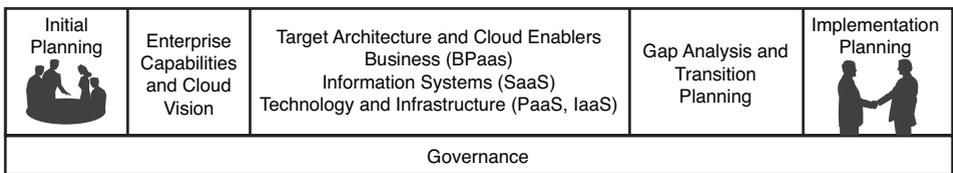


Figure P.1 Life cycle of an enterprise cloud adoption strategy

Yes, This Book Is Applicable to You

Is this book applicable to you if you are a small to mid-market company or perhaps if you do not have an EA? Yes. Consider the following three points. First, the value and expectations of a cloud adoption strategy are described as well as key considerations such as augmenting your delivery model with cloud that includes dealing with multisourced environments, risk mitigation, financial considerations, and other strategic imperatives such as roadmap development. All of these are business criteria that must be considered to develop an effective strategy, and such insights are significant for all business models irrespective of the size of your company. Second, special considerations for the small to mid-market company are incorporated into this book. Third, if you have a business strategy and if you have an IT strategy, you have some basic EA fundamentals and you will learn techniques for incorporating cloud so that your organization reaps optimal benefits. So read on and

discover how you can ready your company for cloud, and learn how you can enable yourself to make more effective, strategic cloud adoption choices. Finally, if you are wondering how cloud computing can make your business more nimble, differentiate your business, or open new markets the content herein will be invaluable.

Introduction

If you are too tactical (implementation focused) in your cloud adoption pursuits, you run the risk of adopting solutions that temporarily add value with a rate of diminishing returns that is faster than you are able to offset. If your approach is too strategic, you run the risk of developing a strategy that is too high level, one that is difficult to relate to and might not get executed as you intended or your strategy becomes shelfware. What then can you do to guide successful cloud adoption in your company?

Understanding your business classification as well as your competencies (as discussed in Chapter 4, “Identifying Cloud Candidates”) is one example consideration that is critical to establishing a value-centric cloud adoption strategy. Knowledge as to where you are as well as your target state can influence cloud adoption decisions. Listed are some common consumer considerations:

1. Small-medium businesses (SMB) might be more interested in Storage-as-a-Service and at a smaller capacity than larger enterprises.
2. Industry verticals, such as healthcare providers, might lean more toward private or community clouds in an effort to meet regulatory stipulations.
3. Large enterprises are more likely to pay for cloud services on account as opposed to credit card purchases.
4. Value added resellers (VAR) add value on top of cloud offerings in the form of customized services. You need to understand the markup and total costs to you as a consumer.
5. Cloud service brokers (CSB) are likely to partner with numerous vendors to generate the best cloud solution for your company. In this book, the expression CSB, systems integrator, and service integrator are used interchangeably and scenarios are elaborated throughout with descriptions in the glossary.

Consider the following business scenario for a mid-market cloud consumer:

The company decided to authorize designated purchases of cloud services using corporate credit cards only. This mid-market company's business requirement therefore was that cloud service providers allow credit card purchases knowing that it is more common for larger companies to purchase solutions using other mechanisms such as purchase orders because of the larger quantities. A key business discussion pertained to credit authorization and more important, billing services. How consumers would be billed for services in a pay per use model, would charges occur daily to credit cards or accrue on a monthly basis, and when would payments get processed? What exactly does pay per use imply with respect to service charges? Another key discussion was how services would be disabled if, for example, usage exceeded an authorized credit limit. In this particular case, the company negotiated the appropriate activation and deactivation of cloud services with the provider with an eye for maintaining outstanding service levels. You learn more about this case study in the epilogue; however, a key message for you to consider is that as you go about planning adoption of cloud in your company, you need to establish enterprise business policies (e.g., purchasing standards for cloud services) as well as establish a governance model that requires appropriate parties to engage in the decision making process at appropriate times.

This book, *Is Your Company Ready for Cloud?*, is a first complete guide to cloud decision making for executives and leaders in both business and technical strategy roles. Using practical experiences with enterprise customers, situational analogies, and vignette style business scenarios, this book contains strategies for readying your organization for cloud adoption and explores cloud business trends and consumption patterns. Included are techniques for selecting cloud products and services, and strategies for driving business value into organizations by planning your adoption through the use and/or extension of enterprise architecture (your integrated business and IT strategy).

This book is not an introduction to cloud computing or EA, but rather illustrates the business value aspects of cloud, offering insights to help you the consumer determine which cloud adoption strategy is the most suitable for your business. If you do not have an EA, this book is applicable as you learn some strategic principles that you can embrace to guide decisions such as data center considerations, operating in multi-sourced environments, intellectual property management, and how to recognize and apply cloud business adoption patterns. Example topics include identification and prioritization of cloud candidates and

enablers, techniques for developing an enterprise cloud adoption strategy, business integration, and governance of your adoption for optimal usage of cloud within your company. At times you find contrasts to organizations with and without an EA and the respective cloud adoption experiences.

Cloud-Sourcing and Traditional Sourcing Options

The expression cloud-sourcing is referenced throughout because there are similarities as well as differences in approaches that you must consider. For instance, from a transition planning perspective, if you are accustomed to working with outsourcing vendors, you may be able to leverage those same vendors as cloud providers, which could lead to more favorable contracts along with a smoother transition due to internal acclimation to outsourced services albeit on-premise or off-premise. At the same time, there are differences in cloud-sourcing that for instance require more self-service in the areas of service selection as well as problem ticketing with which you must become accustomed. In essence, you have some advantages to cloud-sourcing if you currently practice traditional sourcing strategies such as outsourcing and managed operations, but there are challenges that you must consider as you prepare your company for a successful cloud experience.

Suggestions for Reading This Book

It is suggested that you read the book from beginning to end, because each chapter builds on the chapter before it, but you can also single out specific chapters to support your circumstances. So read on and let me know what you think, you can contact me at pkisom@mac.com, [@pkisom](#) on Twitter, or on my cloud consumer insights blog at <https://www.ibm.wm/developerworks/mydeveloperworks/blogs/CloudConsumerInsights/?lang=en>. Kerrie can be reached at klholley@us.ibm.com or on Twitter [@kerrieh](#). Chapter highlights are

- **Chapter 1, “Business Value of a Cloud Adoption Strategy”:** What is the business value of a cloud adoption strategy? In this chapter, ten expectations are described in an effort to emphasize the significance, relevancy, and the impacts of strategy omission.

- **Chapter 2, “Business Value of Incorporating Cloud into Your EA”:** What value is expected by incorporating cloud into your enterprise architecture? This chapter answers such questions and describes the impacts of considering both business and technology to guide cloud adoption decisions. You learn of key considerations for organizations that may not have or practice the discipline of EA and the effectiveness when it comes to cloud adoption.
- **Chapter 3, “The Life Cycle of Your Enterprise Cloud Adoption Strategy”:** This chapter describes the life cycle of an enterprise cloud adoption strategy. You review new additions and/or augmentations to existing EA work artifacts as applicable from a consumer’s perspective. You review examples and approaches for determining key considerations that help you recognize and capture cloud-specific business requirements. And you find specific considerations for organizations that have incorporated service oriented architecture (SOA) into their enterprise.
- **Chapter 4, “Identifying Cloud Candidates”:** How do you go about deciding the contents of your cloud service portfolio? This chapter provides techniques for identifying cloud candidate components (including components within larger outsourcing or managed services solutions) as viable solution alternatives.
- **Chapter 5, “What About Governance?”:** You may have experienced the outcomes of organizations where governance is strong as well as those situations where governance is merely paperwork with no compliance. This chapter provides practical considerations for enabling governance in an enterprise where cloud is a part of the organizational landscape. Because cloud solutions often involve outsourcing, this chapter also provides guidance for governing in the presence of outsourcing.
- **Chapter 6, “Mitigating Risk”:** Learn how to recognize and mitigate cloud adoption risks, including information security breaches, cost overruns, and inadequate operational performance by making explicit mitigations, which are implicit with older alternatives to cloud such as IT outsourcing, time-sharing, and the use of in-house server farms.
- **Chapter 7, “Planning the Transition”:** This chapter provides transition planning considerations and example roadmaps for transformation to cloud with perspectives for the consumer, provider, and integrator. Topics covered include addressing legacy applications, business process transformation, and outsourcing.

- **Chapter 8, “Financial Considerations”:** This chapter provides financial considerations required to build and maintain sponsorship of your cloud business case. This chapter also provides strategies for considering as well as integrating cloud into your EA so that implementation projects leverage the knowledge and guidelines presented.
- **Epilogue, “Thinking Beyond the Race”:** This epilogue provides a summary of the book’s contents and provides suggestions on how to apply. Forward thinking commentary includes cloud business adoption patterns and trends, and emerging business technologies.
- **Appendix A, “Augmenting Your Delivery Model with Cloud”:** While Chapter 2 demonstrates how to incorporate cloud into your EA and Chapter 3 emphasizes development of your enterprise cloud adoption strategy, this appendix provides business considerations for augmenting your delivery model, such as the use of data centers with cloud as well as strategies that you should consider to maintain or even improve your brand.
- **Appendix B, “Cloud Case Studies and Common Questions”:** Additional examples and analysis of cloud solution decisions made with and without the use of EA. This section includes some common questions asked about cloud and provides responses, along with case studies for cloud adoption in small and large companies.
- **Appendix C, “More on Cloud Business Trends”:** Initial discussions on cloud business trends occur in the epilogue. The topic is continued with a focus on innovation and thoughts pertaining to the future of cloud computing.

Target Audience

The target readers are executives (non-IT as well as IT) of companies who are, or will be, making business process automation and enablement decisions. The roles include C-level executives such as the CIO and CFO; non-IT C-level executives; business architects—technical and non-technical; enterprise architects; business process owners; and line of business (LOB) leaders. In addition, the vignette style and practical case studies are conducive to academics (schools, colleges, and universities). Some example audience types that would be interested in this book are

those who make, influence, and/or recommend business enablement decisions including department leaders and delivery teams.

References

Several books were consulted while working on this project. Thank you to each of the authors for your work!

- *100 SOA Questions Asked and Answered* by Kerrie Holley and Ali Arsanjani (Boston, MA: Pearson Education, 2010).
- *Cloud Computing for Business by The Open Group™* (Zaltbommel, Netherlands: Van Haren Publishing, 2011).
- *Enterprise Architecture as Strategy* by Jeanne W. Ross, Peter Weill, and David C. Robertson (Boston, MA: Harvard Business School Press, 2006).
- *Get Ready for Cloud Computing* by Fred Van der Molen (Zaltbommel, Netherlands: Van Haren Publishing, 2010).
- *Information Systems Project Management* by Mark A. Fuller, Joseph S. Valachich, and Joey F. George (Upper Saddle River, NJ: Pearson Education, 2008).
- *Innovation Nation* by John Kao (New York: Free Press, a division of Simon & Schuster, 2007).
- *The Greening of IT* by John Lamb (Boston, MA: Pearson Education, 2009).
- *The Investment Answer* by Daniel C. Goldie and Gordon S. Murray (New York: Business Plus, 2011).
- *The New Language of Marketing 2.0: How to Use ANGELS to Energize Your Market* by Sandy Carter (Boston, MA: Pearson Education, 2009).

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3

The Life Cycle of Your Enterprise Cloud Adoption Strategy

In the previous chapters, you learned about the business value of developing a cloud adoption strategy and the value of incorporating cloud into your enterprise architecture (EA). You also learned some EA principles that you can embrace to help you determine and develop the appropriate strategy for your company. Armed with an understanding of the value of enterprise architecture for cloud adoption, you are ready for this chapter, which describes the life cycle of your enterprise cloud adoption strategy, an outcome of integrating cloud into your EA. You use the life cycle as your foundation for strategically planning your cloud adoption as well as to evolve your EA to include cloud specific goals, cloud standards, best practices, and project guidance on cloud usage. The focus is “how and what to” incorporate to ready your company for success along your cloud adoption journey. In this chapter:

- You review supporting cloud adoption activities and learn key work artifacts—points of view for documenting details such as your organization’s readiness for cloud adoption and models for capturing your cloud service portfolio. These work artifacts can be leveraged with cloud providers for requirements specificity, and they should be added to your EA so that your business goals are realized through active governance and management using EA.

- You discover approaches and techniques for determining key considerations that help you recognize and capture cloud business opportunities so that you can develop the optimum strategy for cloud adoption in your enterprise.
- You learn considerations for strategy development relevant to organizations that have incorporated service oriented architecture (SOA).

The life cycle is comprised of six phases, as illustrated in Figure 3.1:

1. Initial Planning
2. Enterprise Capabilities and Cloud Vision
3. Target Architecture and Cloud Enablers
4. Gap Analysis and Transition Planning
5. Implementation Planning
6. Governance

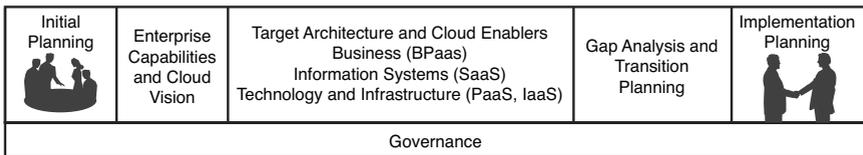


Figure 3.1 Strategically plan and position your company for successful cloud adoption.

The following sections examine each phase of the cloud adoption life cycle in greater detail.

Initial Planning

The initial planning phase involves exploration of your business to establish the context for enterprise cloud adoption and produce the initial, high level plan. You should review the existing case studies, such as those depicted in Appendix B, “Cloud Case Studies and Common Questions,” to justify development and execution of your strategy.

In addition to business and IT executives, you should assign an enterprise architect with cloud business strategy and governance experiences as this leadership facilitates the process now and in subsequent phases. Requests for Information and Proposals (RFIs/RFPs) are submitted for budget, planning, preliminary return on investment (ROI) analysis, and

vendor selection criteria are determined. Security considerations are incorporated throughout each phase as is governance.

NOTE

At this point, you are focused on determining and developing the appropriate cloud adoption strategy so vendors with synergistic strategies, adoption, and governance experiences are selected.

Key activities in the initial planning include

- **Determine business context:** Your business context helps stakeholders understand the purpose, goals and expected business outcomes for cloud adoption. Adoption of cloud computing must be treated as a strategic choice not a technology or outsourcing choice. Cloud is a huge change in how you acquire and use technology and how you interact and support your employees and your customers.

Envision new opportunities, new markets, and where cloud computing accelerates the strategic direction of your company.

Envision an IT infrastructure capable of supporting a rapidly changing business model—one in which IT is not a queue or bottleneck for new business capability.

Envision a computing architecture in which platform or systems no longer constrain business agility—one in which business solutions could be composed rapidly and deployed on demand to any authorized user on any system, anywhere in the world.

This is your vision for a powerful new computing architecture. This vision is not about building castles in the sky but rather about a target state for your new computing environment fueled by cloud computing.

- **Describe the business environment, boundaries, and targeted beneficiaries of your strategy:** This is where you get more specific using scenarios and or use cases to describe what will be possible, what will be different, what future business capabilities will be made possible with cloud computing.

You examine the benefits of cloud adoption and these benefits translate to scenarios, which accelerate realizing strategic imperatives.

You work with key stakeholders to identify, detail, and prioritize use cases for cloud adoption. These use cases are specific and detailed such that all stakeholders see the value proposition of cloud adoption.

- **Determine required stakeholders:** Some lines of business or some business processes will gain greater value of cloud adoption than others. Adoption may create dependencies between stakeholders and processes. Hence, key stakeholders must be understood and identified by key initiatives for cloud adoption. Stakeholders can make or break the success of cloud adoption in terms of their willingness to sponsor the transformation required in organizational changes, governance, vendor partnerships, and possibly technology adoption. Stakeholder influence must be considered along with their ability to motivate and navigate their key influencers.
- **Explore cloud case studies:** Gaining visibility into what other companies have experienced as value, risks, and lessons learned from cloud adoption is essential. This requires working with analyst companies, technology vendors, and system integrators to understand the art of what is possible with cloud. Grounded in the context of actual successes of other companies' business results with cloud adoption.
- **Establish your approach for developing your strategy:** Making a determination of how the strategy will be developed and realized is essential. Strategy without implementation is worthless as it's the implementation of the strategy that creates business results. Developing a strategy armed with an actionable roadmap or plan is a requirement.

Determining whether facilitated workshops, blogging or social collaboration, or all of the above will be used to solicit input and feedback for strategy development is required. This is where identifying the key stakeholders makes a difference because interviews with each will be required to define the approach as well as defining the strategy.

Publishing your high level plan and a clear set of expectations for moving onward to the next phases of the life cycle is necessary.
- **Establish vendor selection criteria:** Understanding your partners necessary to realize your cloud adoption strategy defines key elements of your eco system for cloud adoption. Determining where gaps lie in your current cloud capabilities that are necessary to reach your vision makes it possible to radically improve and implement your cloud strategy. The vendor selection criterion becomes a tool for selecting and maintaining the necessary vendor and partner mix.

- **Secure executive sponsorship:** Identifying and gaining commitment from the necessary executives are fundamental to successful cloud adoption. Executive sponsors must possess authority to make binding decisions and the willingness to exercise this authority. Hence, executive sponsors must be cultivated.

Key work artifacts resulting from the initial planning include

- Business context, which describes the future for your organization in adopting cloud—for example, new business models enabled or new capabilities made possible.
- High level plan, which is more than a Gantt chart. It should consist of a plan of projects along with the expected business outcome to be realized, the project owner, metrics for gauging the success of the project, dependencies and risks that must be managed.

Enterprise Capabilities and Cloud Vision

It is essential that you understand your enterprise goals and objectives. You need this information so that you establish a realistic cloud adoption strategy, and just as with EA you want alignment between your enterprise vision and your strategic vision for cloud adoption so that activities and outcomes add value to your organization. Specifically, you want to understand your enterprise goals and objectives in the following areas:

- New capabilities that the business needs to bring to the market in the next 12 months
- Services or applications currently constrained due to time to market needs
- Opportunities to preserve capital or avoidance of operating expense
- Requirements or needs to provide ubiquitous access to consumers, customers, or devices
- Needs for improved scalability

Factoring in your understanding of enterprise goals and needs into the formation of your cloud vision provides the business context to make cloud computing transformational for your business. That is, the business use of technology changes as technology related business risk is identified and managed; and IT queues get eliminated as a barrier for creating new business capabilities.

All of this requires you to plan for governing your cloud adoption strategy as it ensures appropriate development with proper controls for progression with business continuity, and upon execution governs implementations so that cloud projects are in alignment with your strategy. The introduction of any new technology or technology paradigm shift creates pressure on the organization. Previously, enterprise architecture may have evolved solely to address internal provided technology solutions, and now it extends to address unique aspects of cloud computing in improving agility, enabling new business models, or simply preserving capital investments.

Questions such as the following must be answered during this phase of the life cycle:

- Is your business and IT aligned? If not, can cloud computing facilitate this convergence between business and IT?
- Do your applications and IT architecture support your changing market needs?
- Is your IT environment inflexible?
- How does your cloud adoption strategy support strategic imperatives—that is, your company's vision?
- How is your company performing today—that is, what's not working that would make a difference in business performance?
- Does cloud computing make your processes more effective and more efficient?
- What cloud business adoption patterns are suitable for your company?
- Who is accountable for making cloud adoption decisions?
- What is your organizational readiness capacity for cloud adoption?
- How will you ensure that your cloud adoption strategy is realized?

While you might have started preparation of your business case in the previous step, it is most likely that stakeholders require additional information to sustain initial approvals. In this second phase, you focus on understanding your overarching ability to undertake or extend business operations to support private, public, hybrid, and/or community clouds. Approaches for obtaining information include conducting visioning workshops and capability assessments. Pilots and/or proofs of concepts are optional, but highly recommended.

NOTE

It is important to recognize that a proof of concept (PoC) is not intended to be a production deliverable. It is generally applied to validate or demonstrate a capability such as a new technology or product feature. A pilot, on the other hand, is usually intended as an early production deliverable and requires change control and requirements management. Experiences show that projects can quickly get out of control when the two are inappropriately applied. For instance, your PoC becomes a production deliverable and you are soon required to manage defects although that was not the original intention, or there is no change control applied to the pilot and it therefore becomes dormant. Be sure to explicitly specify your desired outcomes (i.e., success criteria) and then plan your PoCs and pilots accordingly.

Key activities in the enterprise capabilities and cloud vision include

- **Develop your cloud decision model:** Developing the cloud decision model is described in Chapter 4, “Identifying Cloud Candidates.” This model provides the use cases for cloud adoption based on strategic goals of the business. This model is essential to understand the future state made possible for your enterprise with cloud adoption. This decision model is grounded in the reality of what is possible coupled with the optimism of a future state.
- **Develop your cloud business case and ROI inputs:** The business case and corresponding return on investment (ROI) model should look at a comprehensive cloud adoption versus ad hoc adoption. It’s not easy to do ROI analysis as most companies use intuition or guesswork. You might

also easily spend months or a year doing ROI analysis necessary for business case development. Using the following approach can help:

1. Create a benefit value tree where when selecting benefits (such as those described in Chapter 1, “Business Value of a Cloud Adoption Strategy”) you distill the value drivers for cloud adoption such as capital preservation, increased time to market, new business opportunities, workforce transformation, accelerated time to market, and so on. Scenarios or use cases should be created for each value proposition..
 2. Identify the applicable cost scenario for each use case.
 3. Calculate the initial, simple return.
 4. Assess and select the cost scenario for the second and subsequent implementations.
 5. Keeping the benefits constant, calculate the returns for the second and subsequent implementations.
- **Assess your enterprise’s cloud adoption maturity level:** Understanding shortfalls between your target state, your cloud vision, and the current state is essential for successful planning and realization of your cloud adoption strategy. Using the traditional CMMI (Capability Maturity Model Integration) thinking, organizations can easily determine whether they are in the formative stages or optimized stages of cloud adoption maturity. Figure 3.2 depicts this model. This determines what level of assistance is required to move faster or whether the current pace is sufficient. You should plan for improvements and incorporate this input into your roadmap as a natural outcome of this assessment.
 - **Conduct vendor selections:** A vendor selection process is necessary to select the partners and vendors for enablement of your cloud adoption strategy. A team should be assembled with a vested interest in the cloud selection process. The first task that the vendor selection team needs to accomplish is to define, in writing, the service, capability, and features required from a partner. This gets further elaborated into a defined set of business and technical needs or requirements. Also, define the vendor requirements. Finally, publish your document to the areas relevant to this vendor selection process and seek both internal stakeholders and vendor inputs. Now you are ready to select vendors.
 - **Determine areas to assess to fully understand your capabilities to succeed with cloud adoption:** Figure 3.3 illustrates the cloud capability assessment areas. Customer and market insights provide clarity on the art of what is possible and how other companies are both innovating and

differentiating themselves with cloud computing. Areas where business innovation can occur must be assessed and understood. Are your EA and/or SOA capability where it needs to be for the cloud adoption strategy to be successful? Assessing yourself in these areas provides a baseline for improvement and successful realization of your cloud adoption strategy.

- **Outline your enterprise governance strategy:** Governance will be mandatory for achieving the goals of your cloud adoption strategy. This includes defining roles and responsibilities for stakeholders essential to cloud adoption.

Your EA governance processes should be utilized, as EA will be a critical success factor in accelerating cloud adoption. Your governance should include a governing body that can create and manage the following aspects of a cloud computing environment:

- Policies
 - Procedures
 - Organizational effectiveness
 - Accountability and reporting
 - Communications
 - Standards adaptation
- **Secure executive endorsements:** Making sure key executive stakeholders and the executive sponsor are onboard and committed is another critical success factor of your cloud adoption strategy. Establishing steering committees or other mechanism for reporting and regular, timely communication is required.

Key work artifacts resulting from the enterprise capabilities and cloud vision phase include

- Cloud Vision, which has a vision statement. Examples of vision statements include
 - The enterprise cloud adoption strategy is the playbook for cloud adoption at our company. We will use cloud computing to drive revenue growth of 50 billion by 2017 and promote our business theme “Win, Drive, and Innovate through the use of smarter business technologies.”
Motivation: Business value is maximized through consistent and effective adoption of cloud solutions.

- We will adopt strategies that expand business efficiencies by enabling our enterprise to operate more effectively during constantly changing business conditions, with ready access to global markets while delivering enterprise-grade performance and cross-border compliance.
- Sample table of contents for your published vision document:
 - Chapter 1: Introduction—Cloud Computing for Our Enterprise. This chapter introduces cloud computing, identifies the document intended audience, and explains the purpose, scope, and organization of the document.
 - Chapter 2: Context for a Computing Paradigm. This chapter takes a first look from an industrywide perspective at how cloud computing can help remove IT roadblocks and permit a powerful new approach to creating value and realizing strategy.
 - Chapter 3: Cloud Concepts and Principles. This chapter provides a canonical view of cloud computing—what it is, how it’s constructed, and how it works; and its value propositions.
 - Chapter 4: Usage Scenarios. This chapter presents a set of business archetypal usage scenarios to illustrate ways in which cloud adoption can be leveraged for competitive advantage and differentiation.
 - Chapter 5: Cloud Vision. This chapter is specific to what you want to accomplish by leveraging cloud computing. It describes what is different, new business models or markets made viable. The benefits and value propositions made possible are also described along with any business motivators.
 - Chapter 6: Reference Architecture. This chapter describes the cloud reference architecture to be leveraged as inputs or created as an output of your enterprise cloud adoption strategy.

- Chapter 7: Vendor Eco System. This chapter describes the universe of vendors for helping with the realization of cloud computing.
- Cloud Business Adoption Patterns describe the relevance of the patterns described in Table 3.1 to the business situation at hand. Each pattern to be adopted should address the key questions identified in the decision analyses. The answers should find themselves in your published vision document for cloud computing.
- Business Case provides the benefits, value propositions and ROI for cloud adoption.
- Governance Model addresses the unique characteristics of governing and managing cloud adoption. The model should focus on decision rights and accountability and include processes, policies, roles, responsibilities, metrics, and organizational change suggestions and procedures needed for successful cloud adoption.
- Transition Plan describes the initiatives and projects necessary for successful realization of the vision. For each project or initiative there should be a corresponding description that includes project objectives, expected business outcomes ownership dependencies, and resources required.

NOTE

The Cloud Vision document is essential to motivating stakeholders and stating clearly how you expect the value propositions for cloud computing to materialize. You can derive aspects of the vision document by conducting a cloud adoption maturity assessment. Your Cloud Vision document may be necessary for final executive endorsements and to firm detailed plans.

Table 3.1 Cloud Business Adoption Patterns

Business Adoption Patterns	Decision Analyses
Allocation	How will cloud service types get distributed within your company or a specific business unit? In other words, what percentage of cloud-sourcing will be Business Process-as-a-Service (BPaaS), Software-as-a-Service (SaaS), Platform-as-a-Service (PaaS), Infrastructure-as-a-Service (IaaS), or other emerging service types?
Broker	Should you leverage a third-party company (e.g., a cloud consultant or service integrator) to make cloud adoption decisions or suggest recommendations for you?
Bundling	Is your preference to buy bundled offerings such as SaaS that is packaged with additional cloud solutions and/or services?
Diversification	What cloud service types and deployment models make the most sense for your company?
Federation	Is it feasible to standardize the use of multiple clouds to collaborate to solve your business challenges without your explicit request prior to each occurrence?
Rebalancing	Will you govern and manage your cloud portfolio such that the benefits balance with solution alternatives and update your portfolio accordingly? For example, shift from IaaS (bottom up) to more BPaaS (top down) or rebalance cloud-sourcing and outsourcing for greater business impacts and to stir innovation.
Resell	Are you interested in reselling cloud services that you buy? And if so, how will you manage profitability?
Self-Service	Should direct interactions with cloud providers be permitted for making cloud purchases, and if so, how and for which stakeholders?
Sourcing	Should you invest in-house, outsource, or cloud-source business solutions?
Trade	How will you handle unused assets due to cloud adoption? Will you sell the assets, repurpose in your organization, trade (e.g., rent out use of assets* or spot trade)?

*The value of the sale of the assets occurs immediately as opposed to future trades, where value is realized at a later point in time.

Approved cloud business patterns are an integral part of your enterprise cloud adoption strategy.

Business pattern usage can vary per business unit.

The successful adoption of cloud computing increases with organizations having effective enterprise architecture practices. Organizations without effective EA practices can start with the transition to cloud computing. Maturity models have come under criticism and praise, but nonetheless such models provide a tool for performing gap analysis when adopting new architectures or computing models.

Figure 3.2 illustrates common enterprise capability measures that are derived from the Capability Maturity Model Integration (CMMI).¹ The model is frequently used for EA capability assessments. By applying the cloud-specific considerations discussed in the next section, you can use this maturity model to determine your cloud adoption capability and develop an actionable, comprehensive strategy suitable for your business.

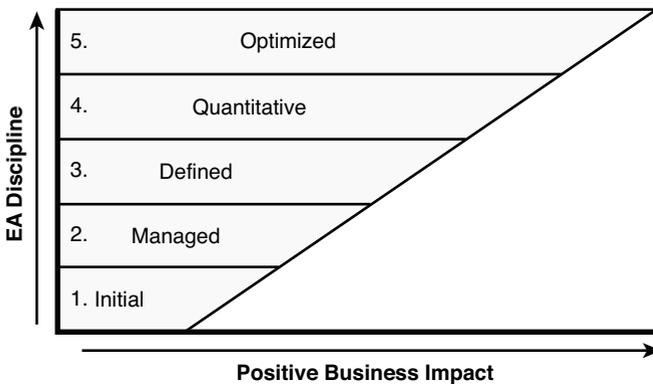


Figure 3.2 Enterprise cloud adoption—Capability Maturity Model

1. **Initial:** EA program is not well-defined and most likely generated solely by and for IT. Projects tend to run over budget and success is nonrepeatable. Company has exploratory or project-specific cloud adoption capability.
2. **Managed:** EA program is forming. There is some manageability and repeatability across departments; however, project compliance in the organization is unpredictable and usually reactionary in nature. Company has departmental and business unit cloud adoption capability.

3. **Defined:** EA program is well-defined, governed, and managed across the organization enabling and generating measurable business outcomes and companywide standards. Project compliance and executive accountability are the norm. IT collaboration is critical to achieving business agility and performance objectives. Company has enterprisewide cloud adoption capability.
4. **Quantitative:** EA program is both qualitatively and quantitatively managed. Quantitative objectives are based on the needs of the customer, end users, and the organization. EA process and performance are managed from strategy throughout project implementations. Company has capability to sense and respond to market demands—a differentiating capability. Company has complex cloud adoption capability that encompasses collaborative partnering and innovation with business partners.
5. **Optimized:** EA program is advanced and continuously improved to support current and emerging business models. Analysis of project data identifies shortfalls or gaps in performance and process improvements. Company has complex cloud adoption capability that encompasses on-demand, dynamic business partnering and innovation.

In theory, the more the discipline of EA is applied throughout your company (whether small, midsized, or large), the greater the opportunity for positive business impacts and a sustainable cloud adoption strategy. For instance, organizations that operate in silos have a lower EA maturity level² and are more likely to have a lower capacity for cloud adoption (levels 1 or 2) and smaller business impacts, while enterprise wide capacity is reflected at levels 3 and above signaling business and IT alignment of cloud undertakings along with governance and management that optimizes the adoption across the entire value network (levels 4 and 5), indicating sustained and larger business impacts.

During this phase of the life cycle, you determine areas to assess to fully understand your capabilities to succeed with cloud adoption. The information collected helps derive your target state as well as what is required to get you to your desired state. Figure 3.3 suggests assessment areas.

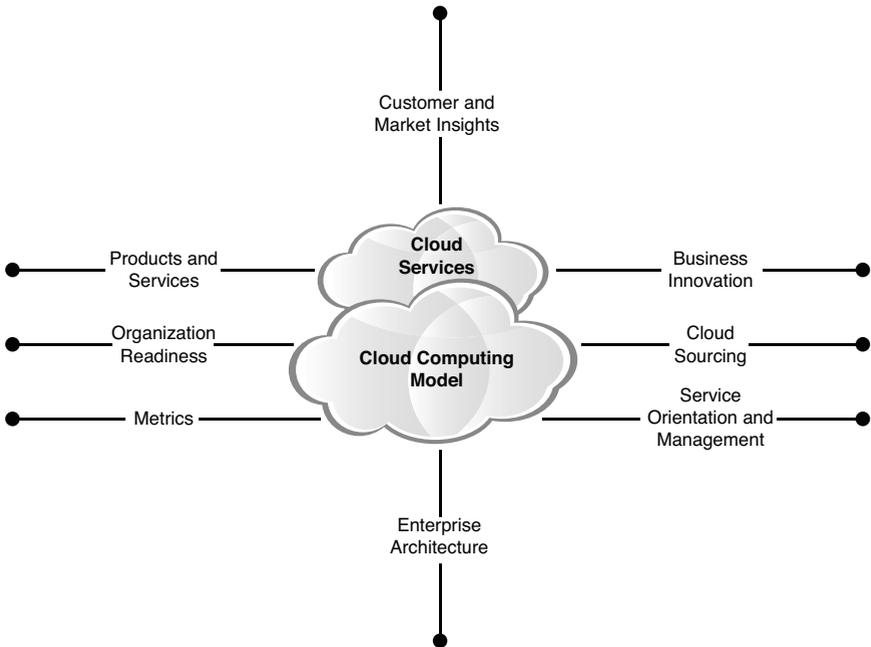


Figure 3.3 Enterprise cloud capability assessment areas

The enterprise cloud capability assessment areas provide the mechanism to make informed decisions in your cloud adoption. Such assessments ensure a common understanding of your organization's experiences and business capabilities so that you make informed business decisions. A description of the enterprise cloud capability assessment areas follows:

- Customer and Market Insights are evaluated to determine your capability to anticipate and respond to demands. This assessment intends to uncover whether your organization actively seeks to understand market trends and directions that impact your business and enterprise. Does your organization proactively seek external viewpoints to improve? Keeping a pulse on trends and directions allows your organization to choose its proper path of innovator/leader, fast follower, or an organization that only pursues paths with historical proven track records.

- Business Innovation is evaluated to determine your innovative talent and practicing skills base. This is essentially an ideation capability and is influenced by your business networks and your ability to partner to create and explore new ideas. Also explored is your process for determining high-value ideas and transforming them into business solutions.

NOTE

The relationship between UPS and Toshiba provides an example of partnering for business innovation. When someone sends in a Toshiba laptop for repair, the UPS company is actually responsible for the repairs although this is not a UPS core business competency. The arrangement stemmed from a business relationship where UPS was warehousing the laptops while Toshiba had repair locations across the U.S. The agreement was that Toshiba repair technicians would become a part of UPS. UPS would thereby cut the mean-time-to-repair (MTTR) cycles by reducing the need to redistribute laptops to Toshiba locations across the U.S. for repair. The agreement reportedly saved in transportation and inventory overhead, and reduced Toshiba's carbon footprint.³ Your enterprise capabilities and cloud vision should seek to identify partnering to innovate.

- Cloud Sourcing experiences are evaluated to determine your skills and experiences using external providers to source solutions. This includes traditional sourcing experiences such as service level agreement (SLA) creation, contract management, and transfer of services to and from service providers. The objective is to learn from what works and what does not work in your culture in working with vendors and partners.
- Service Orientation and Management are assessed to determine your familiarity and capability to operate in a service-oriented capacity. Are you using services and SOA thinking to improve the effectiveness of your business and IT?
- Enterprise Architecture assessments of your practices include integrated business and information technology architecture and capability. The key components assessed are business architecture, information systems architecture, infrastructure architecture, and governance.
- Metrics must be identified to enable continuous improvement. Metrics provide a measurable attainable goal and can be used to improve the

adoption approach. The objective is to understand what metrics have been captured in your company to-date and the experience and confidence levels in the organization with measurement programs.

- Organization Readiness assesses your culture and organization readiness for adoption of cloud. Purchasing patterns are examined to determine whether there is a culture of objective based decision making in purchases and procuring of services.
- Products and Services are assessed to determine your core competencies and for tracking delivery of products and services.

Target Architecture and Cloud Enablers

This phase is a reminder that whether you are pursuing cloud adoption now or anticipate adoption in the future, it is a good idea to update your architecture to include cloud considerations. For example, what are your business principles for cloud adoption? Such principles represent durable statements of direction and guide adoption decisions when the principles have been vetted with the proper stakeholders. How should you govern in a single or multisource environment, and what are your standards for conducting business in virtualized environments? Other examples of cloud considerations are to understand the targeted consumers of your cloud services, their locations, and your potential for new business. The answers to these types of questions form the basis for a stable foundation (your architecture) that all business units can reference and leverage for creating sustained value. It frees your teams to focus on more business critical initiatives such as innovation and developing practices to effectively manage cloud service providers, bringing competitive advantages to your organization. If a solid foundation is not in place, extra work might be required to plug in adopted solutions, which most likely will cause inefficiencies in your cloud adoption.

You are encouraged to select cloud solutions that are business driven. Focus on business processes that might be enhanced with cloud computing, innovated, augmented, or newly formed due to cloud. Your business drivers and processes are reflected in your business architecture (BA). Regardless of your target entry point (SaaS, IaaS, and others), your BA can influence architectural decisions in each of the respective domains to enable any selected entry point, and it helps you determine requirements

for your cloud providers. If, for instance, your targeted business markets (reflected in your BA) are of international scale, you should team with your business and technical teams first, followed by potential providers to ensure that your networks can handle the added capacity in a secure manner and that potential cloud solutions are compliant with regional and corporate regulations.

The following sections provide recommended conceptual considerations and updates to your EA to promote enterprise cloud adoption readiness and consistency in adoption throughout your company. Three areas are explored for updates in your enterprise architecture:

- Business Architecture and BPaaS
- Information Systems and SaaS
- Technology & Architecture and PaaS and IaaS

NOTE

High level requirements are depicted in each of the following discussion topics. These requirements influence cloud adoption decisions and are inputs into service and operational level agreements generated during the implementation phases. In addition, the requirements can represent organizational change (people, process, information, and technology).

Business Architecture (BA) and Business-Process-as-a-Service (BPaaS)

Now that you understand your business capabilities, and have established a vision for cloud adoption in your organization, the next step is to establish your target BA. This includes your core competencies and strategic business priorities, as discussed previously, where you leverage this information to determine key business events, processes, and opportunities for cloud sourcing. In essence, your BA is a visual, comprehensive representation of your company's business strategy. It contains all the information discussed and is a cloud enabler. Figure 3.4 illustrates a high level, one page view of a BA. There are minor augmentations to BA when it comes to cloud consumers; however, the role of the business

architect and the use of BA can significantly influence your cloud adoption decisions.

Consider that you decide to use a provider’s platform to support your SaaS solutions. In this situation, you still need to ensure that the appropriate stakeholders (generally reflected in your BA) are able to consume the appropriate services. You also need to ensure that there is an information taxonomy and business information model (described later) that is shared and understood by your organization and can be discussed with your provider so that, for instance, a Sales ID that is used on premise means and is applied as a Sales ID in your cloud environment.

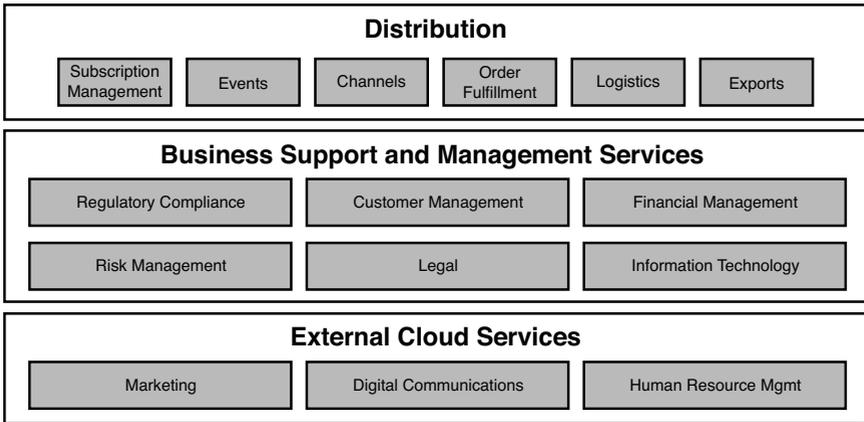


Figure 3.4 Target business architecture (excerpts)

NOTE

A business’s information taxonomy represents a division of a subject into ordered groups or categories along with the logical relationships between them. The understanding of the information an enterprise uses is expressed in a business information model.

If the decision is to adopt one or more on-premise private clouds, understanding your business events and processes (which are elements of your BA) is required so that you know your elasticity needs as volumes are expected to peak as well as hit low points. You are required to communicate these business requirements to your providers (in-house in

this situation) so that they can ensure that the solutions are interoperable, but also to adequately plan to meet your service capacity requirements such as when they can expect and plan automated ramp-ups of server and storage capacity.

Your BA contains information such as business events, stakeholders, business rules, geographical locations, and policies. For example a business policy for key business processes is that there is zero tolerance for provider inaccessibility and system downtime. These influence your cloud business requirements and adoption decisions. You should utilize your BA as a first point of reference in guiding your cloud adoption decisions regardless of expressed entry points. You should review your BA, frequently, with key stakeholders so that it continuously evolves as your business priorities evolve.

In this phase, you establish mechanisms for displaying your BA and cloud opportunities, and you incorporate decision considerations for outsourcing business processes in entirety or in part to cloud. This information is captured and reflected as a part of your integrated business and IT strategy as guidance for cloud implementation planning and development initiatives.

Key activities relative to this phase of cloud adoption, target architecture and cloud enablers, business architecture and BPaaS include updating your BA:

- **Document your business competencies:** Review and document your business competencies: abilities, skills, proficiencies, experience, and expertise. That is, essential capabilities necessary for the success of your business.

- **Identify core business processes and events:** Document business operational locations, business interactions, and actors.

Document the relationship interactions between organizations and business functions across the enterprise using a Business Interaction Matrix. This helps illuminate the value chain across organizational boundaries.

The Business Interaction Matrix shows several key entities and relationships: business services rendered by business function and/or organization, dependencies, and business service relationships.

- **Capture BPaaS business requirements:** Understand which applications and supporting processes can be replaced with a shift to a vendor-provided application platform. This requires an understanding of what

information can be shared and lives in the cloud and business processes that can operate in the cloud.

- **Review and document business agility indicators:** Documenting the agility indicators for a process is necessary in making the decision on BPaaS. For example, what is the degree of customization required? How often do regulatory changes occur? What is the impact of loss, data security, or non-compliance? Answering these questions helps define the flexibility (i.e., agility) needs of a given function or process.
- **Capture your financial strategy:** This entails defining acceptable BPaaS pricing models for your stakeholders.

NOTE

Consumability⁴ is an example high level cloud business requirements category that focuses on end user experiences. You need to ensure that consumability is not overlooked when making decisions on cloud enablement. Your work artifacts for capturing requirements should include consumability by addressing ease of use and integration needs. You should have standardized business requirements work artifacts of which consumability should be added as a category.

Key work artifacts relative to cloud adoption, target architecture and cloud enablers, business architecture and BPaaS, include updating your business architecture with

- Business Interaction Matrix defining a meta-model of key business entities and their relationships; functional domains, business services, business services rendered by functional domains, organizational boundaries, and the dependencies. Developing this matrix helps in understanding the value chain where aspects will be BPaaS cloud candidates.
- BPaaS Cloud Adoption Principles reflecting durable statements of direction when adopting BPaaS. Such principles are vetted with key stakeholders and are used to refine requirements so that they satisfy the principles or suitability of vendor/partner solutions. Principles should pass a simple test of “so what.” That is, if the principle does not have impact or cause some debate it may not be a durable statement of IT direction. The intent of principle development is to avoid statements that

everyone would agree to; that is, statements that do not cause transformation or change are not as valuable or impactful as those that do force change toward strategic goals. Some example cloud adoption principles are listed in Table 3.2.

- Business requirements for BPaaS, which might address the types of applications or business processes suitable for BPaaS. Types of applications might be grouped into processes that are not differentiated; vertical applications that are self-contained crossing few organizational boundaries; standardized process models; or applications with few if any real-time connectivity requirements. Business information that must be included is also addressed. Use cases for BPaaS candidates are created along with corresponding user profiles.
- Agility Metrics, which inventory by process or functional area and gauges the relevance and necessity of BPaaS. Those gauges could include number of dynamic business rules, degree of customization, geographical variations, compliance, or security.

Table 3.2 Example Cloud Adoption Principles

Principles	Description
1	Cloud adoption for BPaaS will be used to reinvent business processes while providing rapid delivery of new services realized without boundaries.
2	Ownership models will be established as cloud portfolios will be governed and managed by business and IT owners.
3	Workloads will be optimized with cloud adoption to preserve capital by driving greater efficiency and performance.
4	Standardized processes that require rapid deployment of new infrastructure or platform must adopt cloud computing.
5	Cloud adoption must comply with regulatory and corporate policies.
6	Applications with unacceptable high costs will be migrated to a cloud support model.
7	Providers with cloud computing solutions must employ open standards and promote business interoperability.
8	Information that will reside in the cloud must be documented in an Information Model with governing characteristics such as information accountability.
9	Cloud exit strategy must exist for each cloud adoption addressing data segregation, data privacy, and data security.

As illustrated in Figure 3.4, Distribution and Business Support and Management Services represent core business competencies where three known cloud solutions exist for Marketing, Digital Communications, and Human Resource Management. This diagram is elaborated in the next chapter when discussing how to identify cloud candidates. Although cloud services are illustrated in the example BA artifact, you should identify a formal structure for capturing your cloud services portfolio. This portfolio serves as a baseline not only for adoption but also for management of internal and external clouds. You can use the following as a cloud services portfolio template to gain consensus within your organization:

- Cloud service name, which provides a unique identity for each cloud service in your portfolio.
- Description of the service enables consumers to understand the capabilities rendered by the service.
- Business purpose describes the expected outcomes when using the cloud service.
- Service type of BPaaS, SaaS, PaaS, or IaaS.
- Deployment model of private, public, hybrid, or community cloud.
- Owners who have responsibility for granting access and ensuring the continued viability of the cloud service.
- Required enablers describing prerequisites for consumers necessary to leverage or use the cloud service.
- Traceability (optional) shows the business process or component that is being replaced or augmented with cloud if that is the case; this is useful for portfolio management.
- Hierarchy (optional) depicts relationships of the cloud to other clouds; this is useful for workflow orchestration and in composite cloud situations.
- Vendor-specific requirements capturing capabilities enabled by the cloud vendor necessary for the service.
- Industry, which shows whether the cloud is associated with a specific industry.

NOTE

An industry vertical cloud, such as life sciences or healthcare, is often governed by a set of industry regulations. One such example is the Federal Drug Administration (FDA), where an example qualification requirement of providers is verification that the cloud is installed and performs as intended throughout all anticipated operating ranges. In such cases, provisioning and decommissioning differ from a horizontal cloud where, since the services are intended for multiple markets or industries, latitude is given to providers to deploy clouds to your consumer specifications and without compliance to industry-specific regulations.

Information Systems and SaaS

When it comes to EA, information systems (IS) comprises two architectural aspects: Information Architecture (IA), which can be summed up as your enterprise's data, structure, and standards for enablement and adoption; and the Application Architecture, representing your enterprise's applications, structure, and standards for adoption and enablement.

SaaS adoption can augment or replace your IS in part or in its entirety, and therefore just as business considerations were discussed earlier, this section discusses information and application considerations for cloud adoption, which relates to SaaS, as sourcing and enablement options must be evaluated.

Information Architecture (IA)

Integration of your business and information systems is required to ensure ongoing value of SaaS investments. With the inception of cloud, boundaries for information ownership and accountability can become blurred, and easy access to SaaS services, although convenient, introduces quick yet inadequately planned adoptions that can result in short-term fixes and an abundance of SaaS solutions that are difficult to manage. A key to success, therefore, is understanding your information and recognizing when it makes sense to source information from cloud.

Figure 3.5 presents a summarized list of some information management and governance considerations that augment traditional IA, which in itself is an enabler of cloud. Each high level requirement, information assurance, information integration, information security, and governance

of information, influences cloud adoption decisions and must be considered both in the context of your company's BA and upon the auspices of enabling growth and/or enhancing profitability through deliberate analysis of costs, savings, risks, and rewards.



Figure 3.5 Cloud considerations for SaaS (information and applications)

The following questions help solidify the context of your IA requirements and, at the same time, should be leveraged to stimulate conversations with providers to further refine your requirements and to make selections as to suitable providers. Chapter 6, “Mitigating Risk,” provides additional details. Resolve to answer each of the following questions to solidify your understanding of the requirements for information architecture in cloud adoption:

- I. Information assurance
 - What information is required to run your business?
 - Can cloud effectively manage your global stream of information?
 - Will the adoption of cloud reduce your sales team’s data quality problems?
 - What are the implications if your provider becomes unavailable or gets acquired by another company?
 - What mechanisms are required to prevent the adoption of cloud from forcing you into counterproductive situations such as you cannot access your own information, or you are forced to continue working with a provider once your contract ends?
 - What are your cloud backup, retention, and recovery requirements?

2. Information integration

- How will information seamlessly integrate across cloud and your company?
- How well will cloud based information models integrate with corporate information models?
- What patterns are appropriate, self-service, broker, federation, others?

3. Information security

- What are financial implications of information security in the cloud or lack thereof?
- What are necessary changes (organization, procedures, and policies) to ensure domestic and global regulatory compliance?
- What information is qualified to enter into the cloud?
- How will information security breaches get resolved?
- Is information restricted to company employees only (single tenancy) or are multiple companies allowed to view and use information provided in the cloud (multi-tenancy)?

4. Governance of information

- Who will make decisions relative to cloud adoption and how will your company communicate, enforce, and address exceptions?
- What are business policies for on- and off-boarding to and from the cloud?
- Who are information stewards and what are the responsibilities?
- How will you determine what information goes into the cloud?
- Who will own information that resides in the cloud?
- What are required information management and governance tools?
- What is the chain of custody for information in the cloud?
- Given a lack of regulatory or legal guidelines to address data privacy, how will you ensure local governments or bodies don't have access to personal information in the cloud?

Key activities relative to this phase of cloud adoption, target architecture, and cloud enablers, include updating your IA:

- **Create or Update your Business Information Model (BIM):** The BIM contains information to be consumed or shared in the cloud. As your company adopts cloud you are still accountable for your data but may no longer be responsible for it. BIM helps in deciding what data should

reside in the cloud. Such a model contains a framework that outlines how your company will gather and use information for SaaS adoption and usage. Data segregation and data security responsibilities should also be defined.

- **Review and update cloud adoption principles.** Table 3.2 describes a set of principles that can be updated to address principles necessary for IA and SaaS.
- **Document high level information requirements:** Requirements in areas of service levels, security, privacy, and other operational needs must be captured to ensure they are fulfilled with cloud adoption.
- **Enhance governance to address information in the cloud:** Information governance must be enhanced to address cloud adoption: data traceability, managing entitlements and identities for authorized users, data retention policies, data separation, and chain of custody for information are examples.

Key artifacts created in this phase of cloud adoption, target architecture and cloud enablers, for Information Architecture include

- **Business Information Model (BIM)** defining your taxonomy, where taxonomy provides a view and structure of your information model. It provides a conceptual framework for organizing content so it can easily be identified and located. Taxonomies are typically hierarchical, multilevel, and show the relationships between concepts of the information model. Table 3.3 lists key characteristics and the process for generating a BIM. Levels 0 and 1 provide the highest level of specificity; these levels are conceptual in nature and appropriate for strategic planning of information required for your cloud adoption. Levels 2 and 3 provide lower level specifications and are most appropriate for project-specific cloud solution planning where development of logical and physical data models are most appropriate. Continuity of business alignment is maintained throughout each level.
- **Cloud Adoption Principles for Information Architecture—SaaS** must be identified and vetted with key stakeholders to guide and prioritize requirements or cloud adoption decisions. The intent of principle development is to define statements of directions that serve to break ties or guide choices when making decisions about the BIM or SaaS. These principles become part of a single set of Cloud Adoption Principles.

- Business requirements for Information Architecture—SaaS can be compiled using the answers to the questionnaires listed earlier in this chapter. Information as a service requirements should be identified.
- Information Governance and Management Strategy addresses the characteristics of governing and managing the BIM in the context of cloud computing. It should address processes, policies, roles, responsibilities, metrics and organizational change suggestions, and procedures that are not represented in your existing IT or EA governance.

Table 3.3 Enterprise Business Information Model Characteristics

Level	Specificity	Description
0	Conceptual	Presents a high level view of information subject areas important to the business and establishes a foundation from which information designs can progress. Analysis at this level is required to determine and specify which information is needed and appropriate for cloud-sourcing.
1	Conceptual	Depicts a high level statement of the main entities comprising the business subject areas defined in Level 0. Analysis at this level is key to determining and specifying information appropriate for cloud-sourcing.
2	Logical	Depicts a detailed statement of the entities comprising the business subject areas in Level 0 per further elaboration of the concepts and entities presented in Level 1. Logical models should contain cloud-sourced solutions.
3	Physical data	Depicts the physical realization of the logical model (Level 2). Physical models should contain cloud-sourced solutions.

BIM is derived from BA and represents information intended to be consumed or shared in the cloud.

A subject area reflects a major classification of information valuable to the enterprise per its business context.

Application Architecture (AA)

Your company will pursue SaaS not met by your capability to extend business functionality, address new markets, create business outcomes faster, or simply to bring solutions to market faster. The benefits of rapid ROI, reduced up-front investments, global availability, and the ability to increase efficiency of your IT budget make SaaS an appropriate course of action.

It is also possible that you will streamline and preserve in-house applications in an effort to optimize return on legacy investments. EA helps as it provides a comprehensive view of your applications, dependencies, and the underlying architecture where, in most cases, your application portfolio is an integrated landscape of in-house, outsourced and cloud-sourced solutions.

You need to understand and manage your application portfolio, cloud included, and one way to do this is to assign ownership and accountability from both the business and IT organizations. This comprehensive view of your applications equips you to make informed and justifiable decisions relative to SaaS adoption and enabling technologies. Similar to IA and as is depicted in Figure 3.5, four cloud considerations must be explored in the context of cloud adoption:

- Application assurance
- Application integration
- Application security
- Governance of applications

Consider the scenario where regulatory stipulations inhibit sharing of specific company information in public clouds. In this scenario, your IA provides directives and requirements to reflect that some information will be sourced from SaaS while proprietary company information must remain internal. Your AA provides directives and requirements that reflect the need for standardization and strategic direction as to appropriate SaaS purchases, as well as federated security patterns to prevent end users from signing on to multiple systems to view reports for which they have no authorization. This scenario emphasizes the need for an integrated internal, external, and business aligned information systems architecture to enable cloud computing in a manner that drives value and sustainable business outcomes.

Key activities relative to this phase of cloud adoption, target architecture and cloud enablers, include updating your AA:

- **Create and/or Update the Application Architecture aspects in your EA:** Application types or categories that are suitable for SaaS adoption should be identified. New applications that can be satisfied through a SaaS model should be reflected by stating when specific qualities are met.

Those aspects could include shorter deployment time, compliance to service levels not otherwise achieved in-house, ability to eliminate costs, and ubiquitous access.

- **Review and update cloud adoption principles:** Table 3.2 describes a set of principles that can be updated to address principles necessary for AA and SaaS.
- **Document high level SaaS requirements:** Service and operation levels should be captured and understood when adopting SaaS. Determining whether application architecture documentation will be maintained representing the various layers of the architecture may be a SaaS requirement. Understanding APIs available to pull and push data may be a requirement. Service level agreement requirements must also be defined.
- **Enhance governance to address SaaS:** Access to applications should be tracked with audit trails in SaaS models. Secured access to data centers and application level intrusion detection are of the utmost importance. Change management, portfolio management, repositories, retention, and accountability for recovery are some key governance aspects that must be addressed with SaaS.

Key artifacts created in this phase of cloud adoption, target architecture, and cloud enablers, for Application Architecture include

- Business requirements for Application Architecture—SaaS should be identified addressing a variety of issues described as follows. AA questionnaires can also be used to capture requirements.
 - Service level agreements: Requirements, escalation if not fulfilled, and of course the types of SLAs (e.g., availability and performance)
 - Integration capabilities describing types of application programming interfaces (APIs) that are available for pushing and pulling data
 - Standards that would be leveraged
 - Security model describing identity management, authentication, and authorization options
 - Exit strategy

- Cloud Adoption Principles for Application Architecture—SaaS must be identified and vetted with key stakeholders to guide and prioritize requirements or cloud adoption decisions. The intent of principle development is to define statements of directions that serve to break ties or guide choices when making decisions about the types of workloads suitable for SaaS. These principles can become part of a single set of principles as is depicted in Table 3.2.
- Applications-as-a-Service questionnaires should be developed to aid in the principle development and the requirements capture. The IA questionnaire can be used as a template.
- Application Governance and Management Strategy addresses the characteristics of governing and managing the application architecture, SaaS, in the context of cloud computing. It addresses governance issues not currently represented in your existing EA governance. Cloud candidates should surface as an output of the governance activities where specific workload types or application types might be most suitable for SaaS.

Technology and Infrastructure, PaaS and IaaS

A significant advantage of cloud computing is your ability to free up IT staff to work on strategic initiatives while nondifferentiating workloads are outsourced to cloud. This is effective whether you choose public or private cloud settings. In fact, according to a recent Computerworld report, a primary reason for NASA's cloud adoption is to get out of the business of running data centers and focus on its core competencies, which are space exploration.⁵ The same is applicable to technology and infrastructure architecture (TA), meaning you can expect your IT software and hardware expenditures to decline considering that cloud-sourced services have better pricing and chargeback features, and you can expect your data centers to shrink in size and energy consumption due to reduced capacity and optimized usage of existing assets such as servers. With this in mind, your strategy should encompass considerations for leveraging alternative, more cost efficient data centers.

According to The Corporate Executive Board Company,⁶ there is overall acceptance of private clouds in the industry, with the adoption of public clouds increasing as a natural progression and due to the maturity of public cloud capabilities. Figure 3.6 shares excerpts of a consumer's data center, the home of technology and infrastructure architecture. The

example illustrates requirements for Developer (PaaS) and Storage (IaaS) clouds, and is a reminder that although sourced from a provider, these services are ultimately the responsibility of the consumer. This requires service level agreements and integrated service management—both topics are discussed in depth in Chapter 6.

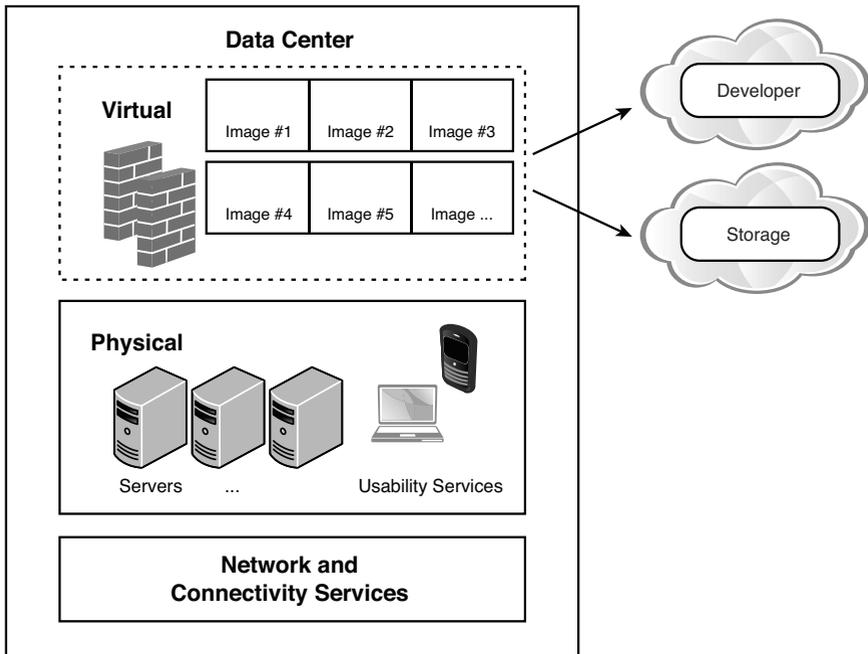


Figure 3.6 Cloud considerations for technology and infrastructure architecture (excerpts)

NOTE

Keep in mind that at this phase of the life cycle you are not focused on implementation details, so from an SLA perspective you provide strategic guidelines, such as who should be involved in contract negotiations, techniques for SLA creation, and you provide SLA mitigation considerations. As you transition to implementation planning and know which cloud services are suitable for your specific situation, you provide project-specific guidance.

Following are core technology and infrastructure components relative to private cloud adoption that you should consider:

- **Capacity:** Organizations should be careful that adequate capacity (e.g., servers, storage, licenses) is on-hand to support cloud consumption while controlling hardware and software spend.
- **Cloud Computing Management Platform (CCMP):**⁷ Consult with your providers regarding their cloud computing management platform. CCMP defines the operational and business support services commonly needed for delivering and managing any cloud service. This specific capability augments traditional EA and SOA environments and is applicable for public and private cloud adoption.
- **Networks:** Be aware that operating your cloud from central data centers and over the WAN can add to latency and degrade cloud performance.
- **Virtualization:** For manageability, you should standardize on a core set of virtual images and a common cloud platform.

Referencing Figure 3.6, should your company have a desire to offload IT workloads to a public cloud, you can eliminate a significant portion of your physical assets (as depicted) with the exception of usability and network/connectivity services since these components are required for both cloud consumption and enablement.

NOTE

Figures 3.4 and 3.6 are deliberate and recommended to discuss strategic cloud opportunities and explore the implications of decisions, such as the scenario just described. Detailed designs will evolve as solution architecture and cloud-specific projects emerge.

Key activities relative to this phase of cloud adoption, target architecture and cloud enablers, include updating your Technology and Infrastructure relative to PaaS and IaaS:

- **Review and update cloud adoption principles:** Table 3.2 describes a set of principles that can be updated to address principles necessary for PaaS and IaaS. For example, a principle could state that “an exist strategy must be defined when adopting PaaS and IaaS.”

- **PaaS and IaaS Requirements:** Review and document technology and infrastructure requirements. Include reliability, availability, and serviceability (RAS) service and operational levels.
- **Update your data center strategy:** A data center strategy addresses capacity and cost capabilities necessary for an efficient operation of a data center. Incorporating data center best practices that include cloud adoption must be included in the strategy.

Key artifacts created in this phase of cloud adoption, target architecture and cloud enablers, Technology and Infrastructure relative to PaaS and IaaS:

- Cloud Adoption Principles for Technology and Infrastructure—PaaS and IaaS must be identified and vetted with key stakeholders to guide and prioritize requirements or cloud adoption decisions. The intent of principle development is to define statements of directions that serve to break ties or guide choices when making decisions about operational concerns. These PaaS and IaaS principles become part of a single set of Cloud Adoption Principles. PaaS and IaaS questionnaires can be developed to aid in the principle development.
- Technology and Infrastructure Governance and Management Strategy addresses the characteristics of governing and managing the adoption of PaaS and IaaS.
- PaaS and IaaS requirements should be documented, which include cloud candidates for PaaS and IaaS.

Gap Analysis and Transition Planning

You have commenced formulating the contents of your strategic roadmap in prior phases, and at this gap analysis and transition planning stage (phase 4), your focus is on reviewing, prioritizing, and finalizing the contents of your roadmap to prepare your organization for cloud adoption.

Gap analysis helps compare your company's actual performance with its potential. Gap analysis provides a foundation for measuring investment of time, money, and human resources required to execute your enterprise cloud adoption strategy and is often referenced as shortfall

analysis. Two common shortfalls when it comes to strategic planning for cloud adoption are ongoing training of others on how to apply the cloud adoption strategy and the principles therein across the enterprise and educating stakeholders on conducting requirements and change management in cloud settings. You will find in the scenarios and case studies that many organizations were mindful to conduct training of team members so that they could effectively maintain the cloud adoption. However, a common omission is managing change and integrating requirements management processes for cloud solutions. Both activities are required transition and implementation planning activities.

Transition plans are the required actions to prepare you for change. Inputs into your transition plans are prioritized shortfalls identified during gap analysis as well as information learned from subsequent phase analysis. As with all the other phases, one of the outcomes of your cloud adoption strategy is deciding who should be involved in developing your transition plans. The format of transition plans varies; however, Chapter 7, “Planning the Transition,” provides some examples and discusses the subject in more depth.

Key activities relative to this phase of cloud adoption, Gap Analysis and Transition Planning:

- **Perform a gap analysis:** Assessing what you do well and where improvements can be made is essential to a successful cloud adoption. Table 3.4 provides an example of the results of an assessment.
- **Understand change management needs:** Sustained success with cloud is essential to achieving benefits. Often this requires an understanding of whether organizational changes are needed, education for key stakeholders, or training materials. Often, organizations must seek outside advice to develop change management recommendations and corresponding actions.
- **Develop your Enterprise Cloud Adoption Roadmap:** The roadmap provides an actionable, living plan for how to make your cloud adoption strategy come to life. Risks must be identified and corresponding actions taken in the plan to address.

Key artifacts created in this phase of cloud adoption, Gap Analysis and Transition Planning, include

- Change Management Plan, which addresses how people, the organization, moves from its current state to the future cloud adoption state.
- Enterprise Cloud Adoption Roadmap, which describes the initiatives and projects necessary for achieving the described benefits of cloud adoption for your enterprise.
- Transition Planning Report, which covers several items:
 - Updated business case.
 - Candidate cloud portfolio and sourcing models. The sourcing models indicate your cloud-sourcing and other sourcing recommendations, an example is illustrated in Figure 3.7.
 - Cloud vendor selection criteria.
 - Change Management plan.
- Enterprise Cloud Adoption Roadmap.
- Technology and Infrastructure Governance and Management Strategy addresses the characteristics of governing and managing.

Table 3.4 Information Stewardship Gaps and Recommendations for Successful Cloud Adoption

Summary of Gaps	Recommendations
Lack of consistent, coherent, and coordinated governance with span of control across the organization. Lack of governance at the executive level.	Establish global governance board with information stewards. Realign groups to streamline governance with span of control that includes cloud.
Lack of global data quality methodology, policies, communication procedures, metadata, etc.	Establish and enforce global data quality methodology, policies, metadata, etc.
Lack of enforcement of data quality and procedures to address issues. Poor control of data sources. Cloud adoption will exacerbate this problem.	Set and enforce data quality controls and measures, improve and certify quality and integrity of data and management prior to commencement cloud adoption initiatives. Publish guidelines for appropriate use of cloud.
Lack of coordination between governance bodies and regulatory/audit compliance processes.	Ensure alignment of common processes through formalized communication channels and/or shared membership. Add cloud business and technology expertise to the governing body.

An enterprise governance structure with common methodologies and procedures is lacking; enterprise information practice is immature; governance boards at the executive level do not exist.

	Relationship-Neutral <i>Activities that do not depend on strong relationship with business for success</i>	Relationship-Rich <i>Activities that require strong relationships or direct interactions with business for success</i>
Strategic <i>Activities that are essential to meeting IT or business objectives</i>		<i>Retain as internal position</i>
Non-Strategic <i>Activities that are not essential to meeting IT or business objectives</i>		<i>Consider partnering with local outsourcer, includes cloud</i> <i>Consider complete outsourcing/off-shoring/cloud sourcing</i>

Figure 3.7 Sourcing model template to be completed prior to commencing implementation phase (Source: 2011, The Corporate Executive Board Company, slightly adjusted based on project experiences)

Implementation Planning

Implementation planning is the final phase. It is derived from the strategic, prioritized roadmap and is project-specific. Implementation arrangements are made with providers in this phase and contracts signed to commence work efforts. Chapter 7 provides detailed discussions on both transition and implementation planning with practical examples.

Key activities relative to this phase of cloud adoption, Implementation Planning, include

- **Define SLAs and select vendors:** Defining SLAs and selecting vendors is a key activity to realize the roadmap. Preparing cloud procurement plans is performed. Reviewing requirements from prior phases is a key input for the SLAs. Cloud provider selection occurs as a final task.
- **Develop integration requirements:** Understanding dependencies and integration needs as you adopt cloud becomes an input into the planning process.

- **Refine your Enterprise Cloud Adoption Roadmap:** Updating the Enterprise Cloud Adoption Roadmap occurs based on the actual vendors and SLAs agreed upon. Updating the plan with reasonable timelines and identifying key resources are performed.

The key work artifacts relative to this phase of cloud adoption, Implementation Planning, is the updated/refined Enterprise Cloud Adoption Roadmap.

Governance

Three areas of governance are addressed in this book, expressly in Chapter 5, “What About Governance?,” and each incorporates cloud considerations:

1. **Strategic direction:** Sets the vision and directs development of the enterprise cloud adoption strategy.
2. **Management and control:** Develops and manages execution of the enterprise cloud adoption strategy; drives and makes updates to EA.
3. **Execute:** Implements the enterprise cloud adoption strategy and communicates experiences and lessons learned.

Key activities relative to this phase of cloud adoption, governance, include

- **Develop the governance framework:** Establishing stakeholder decision rights and authority in terms of cloud purchasing and vendor selection is performed. The communications plans are addressed in this framework. The cloud decision model described in Chapter 4 will be used.
- **Create a cloud reference architecture:** Updating EA to include a cloud reference architecture provides guidance to executives, key stakeholders, or lines of business as to what’s available for cloud adoption in the enterprise.
- **Refine your Enterprise Cloud Adoption Roadmap:** Updating the Enterprise Cloud Adoption Roadmap occurs based on the actual vendors and SLAs agreed upon. Updating the plan with reasonable timelines and identifying key resources is performed.

The key work artifacts relative to this phase of cloud adoption, Implementation Planning, are

- Governance Framework provides the model for implementing governance for cloud adoption.
- Cloud Reference Architecture, which becomes part of the Enterprise Architecture. This reference architecture provides the guidance and direction necessary for teams to successfully adopt cloud in your enterprise.
- Enterprise Cloud Adoption Roadmap that describes the initiatives and projects necessary for achieving success with cloud adoption.

The Significance of Service Oriented Architecture (SOA)

If you have incorporated service oriented architecture (SOA) into your EA program, you are much farther along when it comes to developing and implementing your enterprise cloud adoption strategy. As you have seen in this chapter, aspects of EA such as applications or infrastructure can be sourced in part or in their entirety from cloud in a shared services (public or private) capacity. If you are familiar with the architectural style of SOA, you know that shared services are a central theme while the uniqueness of cloud is the dynamic ability to expand and contract resources on demand to fulfill shared service requests and meet your business needs.

Some basic attributes of SOA are embedded in cloud that you should consider when developing your enterprise cloud adoption strategy:

1. Understand your business processes and use this information to guide identification of service candidates. You will follow the same or similar principles to identify cloud candidates. This topic is discussed in Chapter 4.
2. Reuse and share services across your value net as much as possible in an effort to reduce costs and optimize return on investments. The same applies to cloud although sharing is between larger and often unknown audiences, particularly in the case of public cloud consumption.
3. Establish appropriate business patterns. Some examples are the extended enterprise, which can be applied to reflect your company's representation of a hybrid of internal and external cloud solutions;

and self-service patterns, which reflect your company's on-demand cloud adoption position.

4. Capture your service management requirements. With cloud, the concept of service management can have even more impact than with SOA if you consider that you can source core business capabilities from the cloud, and often SLAs, along with strong portfolio management, are the only indicators that you might have relative to delivery assurance.

A key point of contemplation when it comes to service management requirements development and negotiations is the criticality of the services that you are cloud-sourcing and the business impacts should your provider get acquired by another company or if services suddenly become inaccessible.

5. Determine whether a cloud center of competency is needed in your organization. Centers of competency provide resources with deeper skill levels in a subject area. These resources are generally sought to validate cloud provider capabilities and help determine the business needs and opportunities for cloud. Some focused skill sets are contract negotiations, product architecture and branding (re-branding is gaining increasing momentum in the marketplace), cloud subject matter expertise, and the ability to manage cloud providers.

Standards

Standards are significant since proper use can drive interoperability and a smoother integration of cloud solutions within existing or target environments. Some standards are specific to your organization, such as your billing or integration standards, some are open and commonly used across industries, and others are specific to cloud providers.

While cloud standards are maturing, it is common to find consumers that insist on cloud capability that can be exposed through Web Services or application programming interfaces (APIs) using industry protocols such as representational state services (REST) or simple object access (REST) or simple object access protocol protocol (SOAP) so that consumers are not bound to a specific provider. Many consumers, for instance, have standards that require exposure of cloud services through their in-house portal. Your flexibility to add new services to your portfolio irrespective of providers, as well as to remove cloud services in

a simplistic, self-service manner is enabled by selecting cloud providers that use open industry standards in addition to ensuring that your in-house teams apply similar concepts.

Following is a summarized list of standards that you should consider for cloud adoption—these standards are applicable to each of the life cycle phases. You will refine this for your specific company needs:

- Corporate policies and standards such as purchasing, chargeback, and budgetary guidelines.
- Industry-specific and/or regulatory standards such as the U.S. Patriot Act and the influence of this standard as to where and how your applications and data will be stored in the cloud. Some international companies, for instance, are concerned about information residing in U.S. data centers because the Patriot Act allows the government to monitor data.
- Standards that enable clouds to consume other clouds with identity management, such as identify federation.
- Standards that promote front-office, back-office, and companywide cloud integration, such as SOA and open APIs.
- Standards that promote simplified, cost affordable movement of applications and data into and out of the cloud, such as open transport protocols.
- Standards that drive security and privacy of your assets, such as audits and assurances, so that once you provision cloud services (for example, virtual machines) your assets are protected, including from your originating provider.
- Service level agreement and operational (SLA/SLO) standards.
- Standards that drive cloud portability so that you can use one provider's platform today and another's tomorrow such as Open Virtualization Format (OVF).

Summary

Following a life cycle of your enterprise cloud adoption strategy ensures investments in cloud are meaningful and positively impact your organization. This chapter described the life cycle and provided some practical examples of how to realize the life cycle. The chapter also highlighted the significance of augmenting traditional EA (your integrated

business and IT strategy) with cloud considerations. If you do not incorporate cloud into your EA, your cloud adoption principles, policies, and procedures will become nonstandardized, which will add to a complex, inflexible environment, and issues with a rogue, cluttered, inconsistent cloud adoption might surface. Worse, the benefits of cloud computing will not be fulfilled.

EA encourages you to make holistic cloud adoption decisions that examine both horizontal—across business units—as well as vertical—business process specific—considerations so that you make informed cloud business decisions. EA domains are examined for relevancy and to guide effective integration and enablement of cloud. A high level mapping of cloud delivery models and EA is provided in more detail than in the previous chapter to demonstrate the interconnectivity of EA and cloud. Business domain defines the processes and standards by which your business operates. The information systems perspective defines and classifies data (structured and unstructured), applications, and the standards that your organization requires for adoption and enablement of business solutions. The technology/infrastructure domain defines the hardware, software, and networking requirements. Examination of each is required to determine best-fit cloud opportunities and ensure development of a sustainable enterprise cloud adoption strategy.

Leverage enterprise architects who drive consistency when it comes to cloud activities and in the development and use of business, technical, and security strategies. In addition to your cloud architects and subject matter experts, leverage the skills of business architects. Business and enterprise architects are accustomed to taking advisory roles and guiding business technology adoption and usage decisions. If you have adopted SOA, you are accustomed to applying cloud adoption principles, such as shared services and reliance on service providers for business capability. You most likely experienced best practices and lessons learned that you carry forward into your cloud adoption strategy, such as balancing legacy and sourced solutions. You appreciate that cloud is a complementary consumption and delivery model to SOA, which is not a delivery model but rather an architectural style or solution pattern.

Cloud standards bodies are emerging so instead of providing a comprehensive list of organizations, incorporated in this chapter are some key areas of standardization that you might consider as a cloud consumer and expect from your providers. Examples are portability and

interoperability. Following are some standards organizations or consortiums that you may find useful to add to your strategy where in the majority of cases you will consult with your providers on relevance and feasibility. You will modify this list to align with your organizational needs:

- **Cloud Standards Customer Council (CSCC):** An end user advocacy group dedicated to accelerating cloud's successful adoption, and drilling down into the standards, security and interoperability issues surrounding the transition to the cloud. A focus is prioritizing key interoperability issues such as cloud management, reference architecture, hybrid clouds, as well as security and compliance issues.⁸
- **Distributed Management Task Force (DMTF):** DMTF's cloud efforts are focused on standardizing interactions between cloud environments by developing specifications that deliver architectural semantics and implementation details to achieve interoperable cloud management between service providers and their consumers and developers.⁹
- **National Institute of Standards and Technology (NIST):** NIST is a nonregulatory federal agency within the U.S. Department of Commerce. NIST's mission is to promote U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhance economic security and improve our quality of life.¹⁰
- **The Open Group (cloud work group):** The Open Group is a vendor-neutral and technology-neutral international consortium, whose vision of boundaryless information flow enables access to integrated information, within and among enterprises, based on open standards and global interoperability. The cloud work group focuses specifically on the development and application of open cloud standards.¹¹
- **TM Forum:** TM Forum is a global industry association focused on simplifying the complexity of running a service provider's business; the Cloud Services Initiative (CSI) recognizes that as buyers start to look at using cloud services there are a number of barriers to adoption. The primary objective of CSI, one of many initiatives, is to help industries overcome these barriers and assist in the growth of a vibrant commercial marketplace for cloud based services.¹²

Application of the enterprise cloud adoption life cycle, as outlined in this chapter, helps determine the best fit cloud solutions and enablers along with alternatives for your company. In the next chapter, you learn techniques for identifying cloud candidates. In addition, you learn why Sharon made specific recommendations for cloud adoption and beyond for Distributors, Inc.

Endnotes

1. CMMI Overview—generally used as a baseline for maturity models. See <http://www.sei.cmu.edu/cmmi/>.
2. EA maturity models and cloud maturity models are fairly popular, but we could not find a converged model for development of an effective Cloud Adoption Strategy. This chapter highlights the convergence maturity model.
3. Colvin, Geoff. 2011. Fortune Investors Guide. “C-Suite Strategies; The UPS Green Dream, Interview with Senior VP Bob Stoffel.” A response to inquiries pertaining to operating beyond UPS core business competencies (see p. 49 <http://www.amazon.com/Fortune-Magazine-December-2010-162/dp/B004GVIJ4I>).
4. Consumability is a necessity for all cloud service types, regardless of whether the adoption is public or private. It is a business requirement that should always be considered when planning cloud adoption.
5. See Computerworld article by Patrick Thibodeau, November 2010, “NASA Wants Its Data Up in the Clouds.”
6. See <http://www.executiveboard.com/information-technology/infrastructure-executive-council/index.html>.
7. “IBM Cloud Computing Reference Architecture,” specifically, the Cloud Computing Management Platform. See <http://www.infoq.com/news/2011/03/IBM-Cloud-Reference-Architecture>.
8. Cloud Standards Customer Council. See <http://www.cloud-council.org/about-us.htm>.
9. DMTF. See <http://www.dmtf.org/standards/cloud>.
10. NIST. See http://www.nist.gov/public_affairs/general_information.cfm.
11. The Open Group. See <http://www.opengroup.org/>.
12. TM Forum. See <http://www.tmforum.org/EnablingCloudServices/8006/home.html>.

Index

A

AA (application architecture),
72-74

accessing on-demand networks, 4

adaptation, enterprise, 137-146

adoption strategies, 2-3

benefits of, 186-200

bottom-up analysis, 95-96

business

influencers of cloud adoption,
283-285

scenarios, 97-99

value of, 26-29

clouds

defining outcomes, 13

determining utility opportunities,
15-16

developing metrics, 19

driving business innovation, 12

governance, 20

identifying use cases, 10-11

publishing stakeholder

involvement, 18

roadmaps, 20-21

specifying ecosystems, 17-18

value of, 21

convergence, 29-34

delivery models, 244-248

GDM (global delivery model), 251

ITaaS (IT-as-a-Service), 254-257

PSDM (project and solution delivery
life cycle), 249-250

SSDM (shared service delivery
model), 252-253

developing, 35-38

EA implementation, 39-41

- life cycles, 45-46
 - gap analysis*, 78-80
 - governance*, 82-83
 - implementation planning*, 81
 - initial planning phases*, 46-47
 - target architecture*, 61-67, 70-78
 - transition planning*, 78-80
 - vision for cloud adoption*, 49-61
- patterns, 228-235
- private cloud adoption case study, 267-277
- SOA, 83-84
- standards, 84-85
- top-down analysis, 91-95
- transitions
 - modifying current business models*, 163-170
 - planning*, 161-162
 - vision, creating*, 4, 9-10
- agility**, 27, 165-168
 - indicators, 65, 199
 - KAIs (key agility indicators), 29
 - metrics, 66
- allocation**, 56, 228
- analysis**
 - bottom-up, 95-96
 - capabilities, 143
 - decision, 97-99
 - gaps, 38, 78-80
 - top-down, 91-95
- APIs (application programming interfaces)**, 74, 84, 109
- application architecture. See AA**
- Application Governance and Management Strategy**, 75
- applications**, 73
 - applications-as-a-Service
 - questionnaire, 75
 - development, 174
 - governance, 104
 - frameworks*, 105-116
 - innovation*, 123-128
 - outsourcing*, 118-119
 - ownership*, 116-117
 - service brokers*, 120-123
- applying federation**, 31
- AppStores**, 122, 305
- architecture**
 - AA (application architecture), 72-74
 - BA (business architecture), 61-67, 181, 197
 - baselines, 36-37
 - delivery models, 244-248
 - GDM (global delivery model)*, 251
 - ITaaS (IT-as-a-Service)*, 254-257
 - PSDM (project and solution delivery life cycle)*, 249-250
 - SSDM (shared service delivery model)*, 252-253
 - Enterprise Architecture, 60
 - enterprise reference architecture
 - case study, 277-278
 - Federal Enterprise Architecture, 26
 - IA (information architecture), 68-72
 - Information Architecture, 72
 - SOA, 83-84
 - standards, 84-85, 221
 - TA, 75
 - target, 61-70, 73-78
- areas, assessments**, 52, 59
- artifacts**, 53, 65, 71
- assessments**, 41
 - areas, 52, 59
 - Enterprise Architecture, 60
 - maturity levels, 52

Organization Readiness, 61
 Products and Services, 61
 readiness, 135
 assets, 37
 reusability, 124
 trades, 56
 assurance, 40, 69, 73
 audits, clauses, 150
 availability, 154

B

BA (business architecture), 32,
 61-67, 181
 reviewing, 197
 transformation, 40
 balance sheets, improving, 197
 balancing
 flexibility, 178
 privacy and transparency, 146-148
 baselines, architecture, 36-37
 BE (breakeven), 41
 beneficiaries, targets, 47
 benefits
 of convergence, 29-34
 financial implications of,
 186-192, 194-200
 big data innovations, 306
 billing, 168
 bottom-up analysis, 95-96
 boundaries, 47
 BPaaS (Business Process-as-a-
 Services), 37, 56, 62-67, 227
 BPM (business process
 management), 209
 BPO (business process
 outsourcing), 98, 231
 Brand, Inc. business scenario,
 201, 204
 breakeven, 41
 bring your own license, 227
 brokers, 56, 120-123, 228
 BSS (Business support
 services), 33
 building environments, 41
 bundling, 56, 228
 Business Innovation, 60
 Business Interaction Matrix,
 64-65
 Business Process-as-a-Services.
 See BPaaS
 Business support services, 33
 businesses
 agility indicators, 199
 architecture. *See* BA
 influencers, cloud adoption,
 283-285
 information models, 63, 70-71
 models, modifying current,
 163-170
 process management, 209
 process outsourcing, 98, 231
 profitability, 195-198
 scenarios, 201, 204
 unit ownership, 117
 values, 26-34
 developing, 35-38
 EA implementation, 39-41
 buyers, considerations, 178
 BYOL (bring your own
 license), 227

C

café-style-services, 169
 candidates
 identifying, 89-95
 bottom-up analysis, 95-96
 business scenarios, 97-99

- discovery workshops*, 96-97
- top-down analysis*, 91-95
- prioritizing, 94
- capabilities, 36, 49-59
- Capability Maturity Model**
 - Integration**. *See* CMMI
- capacities, 41, 77, 94
- case studies, 48
 - enterprise reference architecture, 277-278
 - hybrid models, 280-282
 - private cloud adoption, 267-277
 - value of clouds, 279
- CCMP (Cloud Computing Management Platform)**, 77
- CFOs (chief financial officers)**, 212
- change management, 172
- checkpoints, 41
- CIOs (chief information officers)**, 208-211
- classification, 148
- clauses
 - right to audit, 150
 - termination, 150
- client satisfaction, 125
- Cloud Adoption Patterns**, 55
- Cloud Adoption Principles**, 74
 - for Application Architecture, 75
 - BPaaS (Business Process-as-a-Services), 65-66
 - for Information Architecture, 71
 - reviewing, 71
 - for Technology and Infrastructure, 78
- Cloud Center of Competency**, 109
- Cloud Computing Management Platform**, 77
- Cloud Security Alliance**. *See* CSA
- cloud service brokers. *See* CSBs
- Cloud Sourcing**, 60
- Cloud Vision document**, 55
- clouds
 - defining, 4, 9-10
 - stacks, 10
 - types, 7
 - use cases, identifying, 10-11
- CMMI (Capability Maturity Model Integration)**, 21, 52, 57
- CoC (Cloud Center of Competency)**, 109
- collaborations, 32, 41, 125, 209, 260-264
- communication, 113
 - executives, 108
 - financial benefits and implications, 186-200
 - protocols, 150
 - service providers. *See* CSPs
- community clouds, 8
- competencies, 64, 92
- completeness of strategies, 41
- complexity, 97
- compliance, 93, 97, 113-114, 138
- components, 33, 92
- constraints, 93
- consumability, 65, 154
- context, 47
- contracts, 150, 171-175
- convergence, benefits of, 29-34
- coordination, 32
- Corporate Executive Board Company, The**, 75
- corporate standards, 111
- costs, 97
 - café-style-services, 169
 - direct, 192

flexible pricing, 168
 lean principles, 169
 managing, 189-193
 opportunity, 195
 reducing, 41
 services, 141, 168
 take-outs, 217
 TCO. *See* TCO
 transactions, 97
 types of, 191-193
credibility, 139
CRM (customer relationship management), 140
cross-divisional teaming, 41
CSA (Cloud Security Alliance), 147
CSBs (cloud service brokers), 120-123, 142
CSPs (communication service providers), 175, 212
CTOs (chief technology officers), 212
Customer and Market Insights, 59
customer-centricity, 139
customer relationship management, 140

D

decision models, 51
 bottom-up analysis, 95-96
 business scenarios, 97-99
 top-down analysis, 91-95
defensive behaviors, 140
defining
 clouds, 4, 9-10
 governance, 20
 outcomes, 13
delivery models, 111, 244-248
 GDM (global delivery model), 251
 ITaaS (IT-as-a-Service), 254, 257
 PSDM (project and solution delivery life cycle), 249-250
 SSDM (shared service delivery model), 252-253
demand, 93
 supply and, 97
deployment models, 6-8
development
 applications, 174
 business cases/ROI inputs, 51
 roadmaps, 20-21
 strategies, 35-41, 48
creating visions, 4, 9-10
defining outcomes, 13
determining utility opportunities, 15-16
driving business innovation, 12
identifying cloud use cases, 10-11
metrics, 19
publishing stakeholder involvement, 18
specifying ecosystems, 17-18
devices, mobile, 300
differentiation, 5
direct costs, 191-192
discounts, volume, 227
discover workshops, 96-97
diversification, 56, 229
documents
 agility indicators, 65
 Cloud Vision, 55
 competencies, 64
 requirements, 71
 SaaS requirements, 74
drivers of cloud adoption, 283-285

E

E&U (energy and utilities)

companies, 232

EA (enterprise architecture), 26

benefits of convergence, 29-34

implementation, 39-41

incorporation strategies, 26-29

life cycles, 45-46

gap analysis, 78-80

governance, 82-83

implementation planning, 81

initial planning phases, 46-47

target architecture, 61-70, 73-78

transition planning, 78-80

vision for cloud adoption,

49-59, 61

mapping, 38

ecosystems, specifying, 17-18

effectiveness, measurements

of, 29

efficiencies, 248

storage, 140

emerging technologies, 235, 238

enablers, cloud, 61-70, 73-78

endorsements, executives, 53

energy and utilities companies,
232

enterprise

architecture. *See* EA

governance strategies, 53

integration, AppStore

standards, 221

reference architecture case study,
277-278

resource planning

applications, 247

enterprise adaptation, 137-146

Enterprise Architecture

assessments, 60

*Enterprise Architecture as
Strategy*, 105

Enterprise Cloud Adoption
Strategy, 110

entry points, 5

environments, 47. *See also*

architecture

frameworks, 105-116

governance, 104

innovation, 123-128

outsourcing, 118-119

ownership, 116-117

service brokers, 120-123

ERP (enterprise resource

planning) applications, 247

evasiveness, 140

events, 64

examples of transition planning,
180-183

exception handling, 114

executives

communication, 108

endorsements, 53

ownership, 117

sponsorship, 49

expectations of adoption

strategies, 2-3

clouds

defining outcomes, 13

determining utility opportunities,
15-16

developing metrics, 19

driving business innovation, 12

governance, 20

identifying use cases, 10-11

publishing stakeholder involvement, 18
roadmaps, 20-21
specifying ecosystems, 17-18
value of, 21
 vision, creating, 4, 9-10
 experimentation, 260-264
 expertise, 140
 extensibility, 93

F

FDA (Federal Drug Administration), 68
Federal Enterprise Architecture, 26
Federal Information Security Management Act (FISMA), 149
Federal Risk and Authorization program (FedRamp), 149
 federation, 30-31, 56, 229
Financial Industry Regulatory Authority (FINRA), 197
financials
 considerations, 186-201, 204
 health of providers, 140
 governance frameworks, 112
 impact, 124
 patterns, 229-331
 strategies, 65
fixed costs, 191
flexibility
 balancing, 178
 pricing, 168
frameworks
 financials, 112
 governance, 105-116
 processes, 112-115

front-line contacts, 32
 fulfillment, 98

G

games, 301, 304
 gap analysis, 38, 78-80
GDM (global delivery model), 251
 globalization, 156-157
 goals, 5
governance, 46, 70
 applications, 73
 defining, 20
 enhancing, 71
 enterprise strategies, 53
 financials, 112
 frameworks, 105-116
 implementation, 38
 Information Governance and Management Strategy, 72
 innovation, 123-128
 metrics, 115-116
 outsourcing, 118-119
 overview of, 104
 ownership, 116-117
 processes, 112-115
 SaaS, 74
 service brokers, 120-123
Governance Model, 55
Gramm-Leach-Bliley (GLBA), 197
 grid computing, 16

H

hidden costs, 191
HPC (high performance computing), 16
HRIS (Human Resource Information System), 35

HRM (human resource management), 98

hybrids

case study, 280-282

clouds, 8

models, 214-216

I

IA (information architecture), 68-72

IaaS (Infrastructure-as-a-Service), 7, 32, 56, 75-78, 95

compute and storage, 226

risk mitigation, 133

identifying

candidates, 89-95

bottom-up analysis, 95-96

business scenarios, 97-99

discovery workshops, 96-97

top-down analysis, 91, 93-95

cloud use cases, 10-11

image, maintaining, 125

implementation, 35

EA, 39, 41

governance, 38

planning, 38, 81

transitions, 161-162

modifying current business models, 163-170

roadmap examples, 180-183

strategies, 171-180

implications, financial

considerations, 186-200

inappropriate cloud providers,

preventing selection of,

138-141

income statements,

improving, 197

indicators, agility, 65, 199

indirect costs, 191-192

industry

specialization, 140

verticals, 231-233

information

architecture, 68-72

sensitivity, 93

services, 104

frameworks, 105-116

innovation, 123-128

outsourcing, 118-119

ownership, 116-117

service brokers, 120-123

stewards, 70

systems, 68

taxonomy, 63

Information Governance and Management Strategy, 72

information sensitivity, 93

information

Information Technology. See IT

infrastructure, 41

governance, 104

frameworks, 105-116

innovation, 123-128

outsourcing, 118-119

ownership, 116-117

service brokers, 120-123

services, 176

technology, 75-76, 78

Infrastructure-as-a-Service.

See IaaS

initial planning, 36, 46-47

innovation, 97, 299

big data, 306

clouds, 304-305

driving, 12

games, 301, 304

governance, 123-128

mobile devices, 300
 natural language, 307
inputs, ROI, 51
insights, markets, 143
intangible costs, 191-193
integrated service
 management, 151
integration, 26-29, 70-73
 benefits of convergence, 29-34
 developing, 35-38
 EA implementation, 39-41
interdependencies, 41
interfaces
 APIs, 74, 84, 109
 governance, 104
 frameworks, 105-116
 innovation, 123-128
 outsourcing, 118-119
 ownership, 116-117
 service brokers, 120-123
internal capacities, 94
International Organization for
 Standards, 147
investments, 30. See also ROI
IS (information systems), 68
ISM (integrated service
 management), 151
ISO (International Organization
 for Standards), 147
IT (Information Technology), 94
 delivery models, 244-248
 GDM (global delivery model), 251
 ITaaS (IT-as-a-Service), 254-257
 PSDM (project and solution delivery
 life cycle), 249-250
 SSDM (shared service delivery
 model), 252-253
 ownership, 118

J-K-L

JIT (Just-In-Time) strategies, 247
KAIs (key agility indicators), 29
key artifacts, 71
KPIs (key performance
 indicators), 30
leadership, organizational
 structures, 107-111. *See also*
 management
lean principles, 169
life cycles, 45-46
 gap analysis, 78-80
 governance, 82-83
 implementation planning, 81
 initial planning phases, 46-47
 SOA, 83-84
 standards, 84-85
 target architecture, 61-70, 73-78
 transition planning, 78-80
 vision for cloud adoption, 49-61
LP (loss prevention), 192

M

maintenance of environments, 41
management, 77, 98, 113
 BPM (business process
 management), 209
 change, 172
 costs, 189-193
 governance, difference
 between, 105
 ISM (integrated service
 management), 151
 OM (order management), 192
 organizational structures, 107-111
 privacy and transparency, 146-148
 responsibilities, 110
 risk, 5, 113, 133-137

services, 94
 SLM (service-level management),
 149-153
mapping EA, 38
markets
 insights, 143
 predictions, 29
master data management, 192
maturity levels
 assessment, 52
 CMMI, 21
McKinsey Quarterly, 145
**MDM (master data
 management), 192**
mean-time-to-repair, 60
measurements of effectiveness, 29
meta-models, 65
metering, 168
methodologies, EA, 38
metrics, 60
 agility, 66
 developing, 19
 governance, 115-116
 ROI (return on investment), 199
mitigation, risk, 198
 change management, 173
 enterprise adaption, 137-146
 globalization, 156-157
 management and response
 strategies, 133-137
 performance, 153
 privacy, 146-148
 QoS (quality of service), 153
 SLM (service-level management),
 149-153
 transparency, 146-148
mobile devices, 300

models, 29
 bottom-up analysis, 95-96
 business
information, 63
scenarios, 97-99
 Business Information Model,
 70-71
 café-style-services, 169
 current business, modifying,
 163-170
 decisions, 51
 delivery, 244-248
GDM (global delivery model), 251
ITaaS (IT-as-a-Service), 254-257
*PSDM (project and solution delivery
 life cycle), 249-250*
*SSDM (shared service delivery
 model), 252-253*
 deployment, 6-8
 hybrid, 214-216, 280-282
 meta-models, 65
 top-down analysis, 91-95
**modifying current business
 models, 163-170**
MTTR (mean-time-to-repair), 60

N-O

natural languages
 innovations, 307
negotiations, contracts, 150
networks, 77
**NPV (net present value), 41,
 188, 200**
objectives, strategies, 210
offshoring, 156
OM (order management), 192
on-demand network access, 4
on-premise private clouds, 63

one-time costs, 191
Open Group, 15
 operational support services, 34
 opportunity costs, 195
 optimization, 27
 efficiencies, 248
 ROI (return on investment), 198
options
 delivery models, 244-248
 GDM (global delivery model), 251
 ITaaS (IT-as-a-Service), 254-257
 PSDM (project and solution delivery life cycle), 249-250
 SSDM (shared service delivery model), 252-253
 sourcing, 92, 97
order management, 192
Organization Readiness, 61
organizations
 change, 171-175
 structures, 107-111
OSS (operational support services), 34
outages, 108
outcomes
 agility, 30
 defining, 13
outsourcing, 56, 94, 118-119, 134, 156
 BPO (business processing, outsourcing), 98, 231
 considerations, 177
ownership, 116-117. *See also* TCO

P

PaaS (Platform-as-a-Service), 7, 32, 75-78, 95, 247
 services, 226
partnerships, 143
patterns
 adoption strategies, 228-235
 financial, 229, 231
 solution, 233, 235
pay
 as you go, 227
 for unlimited clients, 190
 per number of concurrent online users, 190
 per seat, 191
 per use, 190. *See also* costs
Payment Card Industry Data Security Standard (PCI DSS) regulation, 138
performance, 27, 30, 140, 153
performance improvement plans, 149
phases, 36, 46-47
physical environment
 security, 157
pilot programs, 171
PIPs (performance improvement plans), 149
planning, 36
 implementation, 38, 81
 life cycles, 45-46
 gap analysis, 78-80
 governance, 82-83
 implementation planning, 81
 initial planning phases, 46-47
 target architecture, 61-70, 73-78
 transition planning, 78-80
 vision for cloud adoption, 49-61
 transitions, 38, 78-80, 161-162
 modifying current business models, 163-170
 roadmap examples, 180-183
 strategies, 171-180

Platform-as-a-Service. *See* PaaS

PoC (proof of concept), 51

point of sale, 192

policies, governance
frameworks, 106-107

portability, 155

POS (point of sale), 192

position statements, 6

prediction of market changes, 29

pricing, flexible, 168

principles, governance
frameworks, 106-107

prioritization, candidates, 94

privacy, 146-148

private cloud adoption, 8, 63
case study, 267-277
enterprise reference architecture
case study, 277-278

processes, 64, 112-115
governance, 104
frameworks, 105-116
innovation, 123-128
outsourcing, 118-119
ownership, 116-117
service brokers, 120-123
models, 37

Products and Services, 61

profitability, 195-198

project and solution delivery life
cycle, 249-250

Project Gold case study, 210-227

projecting ROI, 13

proof of concept, 51

protocols, communication, 150

providers, 244
preventing inappropriate selection
of, 138-141
selecting, 142

provisioning, rapid, 166

PSDM (project and solution
delivery life cycle), 249-250

public cloud computing, 8, 244.
See also strategies

Q-R

QoS (quality of service), 136,
153, 176

questions and responses,
286-295

rapid development, 165-168

rapid provisioning, 166

readiness assessments, 135

rebalancing, 56, 229

recovery point objective, 227

recovery time objective, 227

recurring costs, 191

reduction of costs, 41

redundancies, 41

regulations, 217
Payment Card Industry
Data Security Standard
(PCI DSS), 138

regulatory requirements, 93

rejection, stakeholders, 143-146

reliability, 33, 155

representational state
services, 84

reputation, 125

Requests for Information and
Proposals (RFIs/RFPs),
46, 157

requirements
BPaaS, 64, 66
documents, 71
Information Architecture, 72
QoS (quality of service), 176

- SaaS documents, 74
 - security, 109
 - reselling**
 - patterns, 229
 - services, 56
 - resiliency**, 141
 - resources**, 36
 - questions and responses, 286-295
 - responses strategies**
 - questions and, 286-295
 - risk management, 133-137
 - responsibilities**, 258, 260
 - CoC, 110
 - management, 110
 - REST (representational state services)**, 84
 - return on investment. See ROI**
 - reusability**, 124
 - reviewing Cloud Adoption Principles**, 71, 74
 - rewards**
 - sharing, 216-217
 - sustainability and, 223
 - RFIs/RFPs (Requests for Information and Proposals)**, 46, 179
 - right to audit clauses**, 150
 - risk**
 - delivery models, 244
 - enterprise adaption, 137-146
 - globalization, 156-157
 - management, 5, 13, 133-137
 - mitigation, 173, 198
 - performance, 153
 - privacy, 146-148
 - QoS (quality of service), 153
 - sharing, 216-217
 - SLM (service-level management), 149-153
 - transferring, 135
 - transparency, 146-148
 - roadmaps**
 - developing, 20-21
 - examples, 180-183
 - ROI (return on investment)**, 35, 41, 46, 94
 - inputs, 51
 - metrics, 199
 - mitigation of risk, 136
 - optimizing, 198
 - projecting, 13
 - roles**, 6, 258, 260
 - RPO (recovery point objective)**, 227
 - RTO (recovery time objective)**, 227
- S**
- SaaS documents, 7, 56, 68, 247
 - governance, 74
 - requirements, 74
 - services, 226
 - specialization, 140
 - Sarbanes-Oxley (SOX)**, 197
 - SAS (Statement on Auditing Standards)**, 150
 - satisfaction**, 125
 - scalability**, 156
 - secure sockets layer (SSL)**, 149
 - security**, 70, 73, 93
 - physical environment, 157
 - requirements, 109
 - selecting**
 - preventing inappropriate, 138-141
 - providers, 142
 - vendors, 52

- self-service, 56
 - business models, 165
 - patterns, 229
 - portals, 209
- sellers, considerations, 178
- service-desk support, 222
- service level agreements.
 - See* SLAs
- service oriented architecture.
 - See* SOA
- serviceability, 156
- services
 - BSS, 33
 - brokers, 120-123
 - costs, 141, 168
 - delivery, 165-168
 - infrastructure, 176
 - ISM (integrated service management), 151
 - managed, 94
 - OSS, 34
 - providers, 244
 - reselling, 56
 - standalone solutions, 214-216
 - types, 6-7
 - utility, 244
- shared service delivery model, 252-253
- sharing risks, 216-217
- simple object access protocol, 84
- SLAs (service level agreements), 60, 74, 76, 114, 134
 - CSBs, 121
 - negotiating, 149
- SLM (service-level management), 149-153
- SOA (service oriented architecture), 46, 83-84
- SOAP (simple object access protocol), 84
- solutions
 - delivery team, 111
 - patterns, 233-235
- sources, 56
 - options, 92, 97
 - reliability of, 33
- specialization, 140
- speed, 27, 165-166, 168
- sphere of influence, 6
- sponsorship, executive, 49
- SSAE (Statement on Standards for Attestation Engagement), 150
- SSDM (shared service delivery model), 252-253
- stacks, clouds, 10
- stakeholders, 48
 - BA, 63
 - CIOs (chief information offers), 208-210
 - financial benefits and implications, 186-200
 - involvement
 - defining governance*, 20
 - developing metrics*, 19
 - publishing*, 18
 - roadmaps*, 20-21
 - rejection, 143-146
- standalone solutions, 214-216
- standardization, 77, 178
- standards, 84-85, 111
 - AppStore, 221
 - governance, 104
 - frameworks*, 105-116
 - innovation*, 123-128

- outsourcing*, 118-119
- ownership*, 116-117
- service brokers*, 120-1223
- Statement on Auditing Standards (SAS)**, 150
- Statement on Standards for Attestation Engagement**, 150
- statements, positions, 6
- stewards, 70
- storage, efficiency, 140
- storefronts, cloud, 305
- strategies**
 - adoption, 2-3
 - creating vision*, 4, 9-10
 - defining governance*, 20
 - determining utility opportunities*, 15-16
 - developing metrics*, 19
 - driving business innovation*, 12
 - identifying clouds use cases*, 10-11
 - outcomes*, 13
 - publishing stakeholder involvement*, 18
 - roadmaps*, 20-21
 - specifying ecosystems*, 17-18
 - value of*, 21
- Application Governance and Management Strategy**, 75
- benefits of, 186-200
- bottom-up analysis, 95-96
- business influencers and drivers of cloud adoption, 283-285
- business scenarios, 97-99
- clarity of, 91
- delivery models, 244-248
 - GDM (global delivery model)*, 251
 - ITaaS (IT-as-a-Service)*, 254, 257
 - PSDM (project and solution delivery life cycle)*, 249-250
 - SSDM (shared service delivery model)*, 252-253
- Enterprise Cloud Adoption Strategy**, 110
- enterprise governance, 53
- enterprise reference architecture case study, 277-278
- financial, 65
- impact, 124
- Information Governance and Management Strategy**, 72
- integration, 26-34
 - developing*, 35-38
 - EA implementation*, 39-41
- JIT (Just-In-Time)**, 247
- life cycles, 45-46
 - gap analysis*, 78-80
 - governance*, 82-83
 - implementation planning*, 81
 - initial planning phases*, 46-47
 - target architecture*, 61-70, 73-78
 - transition planning*, 78-80
 - vision for cloud adoption*, 49-61
- MDM (master data management)**, 192
- objectives, 210
- patterns, 228-235
- private cloud adoption case study, 267-277
- response, risk management, 133-137
- SOA**, 83-84
- standards, 84-85
- Technology and Infrastructure Governance and Management Strategy**, 78
- top-down analysis, 91-95

transitions
modifying current business models,
 163-170
planning, 161-180
roadmap examples, 180-183
 vision, 210
streaming technologies, 304
suitability, 97
supply and demand, 97
support
 BSS, 33
 OSS, 34
 service-desk, 222
sustainability, 33, 223, 248

T

TA (technology and infrastructure architecture), 75
tangible costs, 191, 193
targets
 architecture, 61-70, 73-78
 beneficiaries, 47
Taxonomies, 71
taxonomy, 63
TCO (total cost of ownership),
 14, 35, 94
teams, solution delivery, 111
technology, 75-78
technology and infrastructure architecture, 75
Technology and Infrastructure Governance and Management Strategy, 78
termination clauses, 150
testing
 pilot programs, 171
 test strategy considerations, 180

time value of money. See TVM
tools, governance, 115-116
top-down analysis, 91-95
Toshiba, 60
total cost of ownership. See TCO
total offering, 141
traceability, 36
trades
 assets, 56
 patterns, 229
transactions, costs, 97
transferring risk, 135
transformation, 40
Transition Plan, 55
transition planning, 78, 80
transitions, planning, 38, 78-80,
 161-162
 modifying current business
 models, 163-170
 roadmap examples, 180-183
 strategies, 171-180
transparency, 142-148
transport layer security (TLS),
 149
trends, 26
 big data, 306
 clouds, 304-305
 games, 301, 304
 innovations, 299
 mobile devices, 300
 natural language, 307
trust, 33
TVM (time value of money),
 188, 200
types
 of clouds, 7, 164-165
 of costs, 191-193
 of services, 6

U–V

- updating applications, 73
- UPS (United Parcel Service), 60
- use cases, identifying, 10-11
- utilities, 15-16, 244
- validation, 35, 41
- value added resellers. *See* VARs
- values
 - clouds case study, 279
 - integration strategies, 26-29
 - benefits of convergence*, 29-34
 - developing*, 35-38
 - EA implementation*, 39, 41
 - NPV, 41
 - strategies, 21
- variable costs, 191
- VARs (value added resellers), 214, 229
- vendors
 - selection criteria, 48
 - selections, 52
- virtualization, 41, 77
- visibility, 97
- vision
 - clarity of, 91
 - cloud adoption, 49-61
 - creating, 4, 9-10
 - strategies, 210
- vitality, 113-114
- volume discounts, 227

W–Z

- work artifacts, 53, 65
- workloads, 176, 195-198
- workshops, discovery, 96-97