

11x Time to Value: Adaptive v. Traditional Business Continuity Approaches

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Summary:

The Adaptive Business Continuity (BC) approach may provide value at least eleven times faster than Traditional BC approaches that are modeled on existing standards such as DRI's Professional Practices and ANSI standard ISO22301. By analyzing the lifecycle of Traditional BC practices as outlined in the BCI's *Good Practice Guide*, estimating the hours it would take a hypothetical organization to execute those practices, and then estimating the value gained from each practice, it is possible to calculate a Time to Value (TTV) for the two approaches. The resulting calculations, while potentially subject to a large margin of error, indicate that the Adaptive BC approach is at least eleven times faster at providing value. In some BC lifecycle phases, the TTV of an Adaptive BC approach may be 18 to 20 times faster. These results have broad and significant implications in the preparedness industry, several of which are highlighted in the conclusion of this paper.

Executive Highlights:

Given a hypothetical organization of 401 employees and ten executives, a blended hourly rate of \$100, and a first pass through all six phases of a Traditional BC lifecycle:

- Overall, an Adaptive BC approach may provide equal value roughly 11 times faster than Traditional BC practices
- Savings remain generally linear with Time to Value 10 to 11 times faster for Adaptive BC even with organizations ten times the size
- In certain phases, an Adaptive BC approach may provide equal value roughly 18 to 20 times faster
- An Adaptive BC approach may provide an estimated cost savings of \$642,750
- An Adaptive BC approach may provide an estimated cost savings of \$713.88 per RVU (Recovery Value Unit)
- Both the Time to Value and cost savings estimates improve using Adaptive BC when given a higher blended hourly rate for executive's time

Introduction:

Commentators like [Regina Phelps](#),¹ [Miles Coburn](#),² [Rod Crowder](#),³ [myself](#),⁴ and others have argued that there is no or minimal direct financial return on investment (ROI) for business continuity. Yet, a BC program must provide some type of value, or we BC professionals are wasting our efforts.

While organizations and practitioners can now [measure preparedness and recoverability](#)⁵ with a fair level of precision, it remains rather difficult to measure the value of any individual BC activity.

Nevertheless, it is important to try. While the BC profession does not yet have an exact measure of value, it is possible to assign some rough estimate of value to a BC activity. Let us call this a “Recovery Value Unit” (RVU), namely, some estimate of the value that an activity provides in order to increase an organization’s actual continuity and recoverability capabilities. Recent developments in Lean theory and Agile project management can provide guidance along these lines.

Once we have a way to begin to estimate RVUs, we can pair RVU estimations with measures of Time to Value (TTV). [TTV](#)⁶ is the amount of time an activity, or set of activities, takes to provide the customer with some actualized benefit or value. By estimating both the value that a BC activity provides and the time it takes to provide that value, professionals can judge the potential advantages of adopting and applying one BC approach over another.

The question for the remainder of this paper is this:

[Between Adaptive BC and Traditional BC, which approach provides the most value in the least amount of time \(a better Time to Value\)?](#)

Two Bitter Truths about Value:

Before we begin to estimate value, we need to address two important facts about the nature of value.

Bitter Truth One:

Just because something is valuable to the provider does not mean it is valuable to the customer.

How many times have companies had to learn this lesson? This truth about value is a major reason for the increasing popularity of the [Lean](#)⁷ approach to business, R&D, product development, software development, and even [operations](#).⁸

“Working software is the primary measure of progress.”

— Agile Principle

BC Formulation: Just because something is valuable to the BC program or BC practitioner does not mean it is valuable to the customer.

What this means for BC is that, just because an activity is something the BC practitioner wants to do in support of BC work, that does not mean it provides any value to the customer. In fact, many Traditional BC practices arguably take value AWAY from the customer – consider, for instance, the time executives must spend in meetings to create, organize, and run a BC Advisory Committee, BC Steering committee, or BC Policy committee.

Bitter Truth Two:

Just because something is valuable to the provider, does not mean it helps the organization meet its needs.

“But what happens if there is no good working definition of value? I can easily imagine a Scrum Team that works through their sprints perfectly, delivers high-quality functionality in a steady pace..., but does not actually deliver anything of value to the organization.”

— Christiaan Verwijs
“What is this thing called (Business) Value?”

How many times have companies had to learn this lesson? This truth about value is a major reason for the increasing popularity of the [Agile](#)⁹ approach to project management and software development in particular. Agile focuses on the needs of the customer, providing iterative value in two- to four-week sprints. Value is measured by the end product itself and whether product help address the customer’s need. A long list of documented requirements, any of which might change on any given week, does not help customers solve their problem; only a functional product does this.

BC Formulation: Just because something is valuable to the BC program or BC practitioner does not mean it helps the organization meet its needs.

The end goal of the BC professional is not to establish committees, create documentation, and hang up BC Awareness Week posters. The end goal of the BC professional is to continuously improve the organization’s ability to recover from an uncontrolled loss of people and/or resources. Our job as BC practitioners is to enable the company and empower its employees to do the best they can to function and continue services following a major incident. BC value must be judged on the basis of whether BC activities are helping the organization address this particular issue. A long list of documented policies, scripts, threat matrices, and impact spreadsheets, any of which might change on any given week, does not help customers solve their problem; only recovery capabilities do this.

Recovery Value Unit (RVU):

Adaptive BC [posits](#)¹⁰ that any department in any organization needs three things to recover from disaster: Resources, procedures, and (crisis) competencies. The more of these three

recovery capabilities that a department has in place at time of disaster, the better able they will be to recover. Because we can enumerate and identify these capabilities, we can measure preparedness and recoverability.

These recovery capabilities should also allow us to take a stab at estimating value. Arguably, any BC activity that directly improves a recovery capability provides BC value. Therefore, at least for the purposes of this paper:

Any activity that directly improves a recovery capability provides at least one unit of recovery value (RVU)

Approach:

We can categorize the functions of any Traditional BC program by using any existing guide, such as ISO22301 or DRI's Professional Practices. For the purposes of this paper, let us use the most recently updated standard, namely the BCI's 2018 [Good Practice Guidelines](#) (GPG).¹¹ According to the GPG, we can break a BC program in to six phases:

1. Policy and Programme Management
2. Embedding
3. Analysis
4. Design
5. Implementation
6. Validation

Note that these phases do not line up to the more flexible and non-linear approach found in Adaptive BC, but it provides a place to start. In each phase, we can estimate the RVU and the TTV of the activities in that phase.

“Agile Project Management - like its lean development counterparts - streamlines the development process, concentrating on value-adding activities and eliminating overhead and compliance activities.”

— Jim Highsmith
*Agile Project Management:
Creating Innovative Products*

Consider a hypothetical organization, a business called SchizzleSoftware. For the sake of round numbers and easy estimates, let us say that SchizzleSoftware has 20 employees in each of its 20 departments, plus an additional 10 executives and one executive assistant, for a total of 411 staff members. Suppose that a BC professional has been asked to launch a BC program for SchizzleSoftware and perform an initial round of preparedness activities.

What value could the BC professional provide, and how quickly? The answer to that question depends a great deal on which BC approach is used.

The next several sections of this paper will examine each of the six GPG phases and estimate the RVUs and TTV for that phase.

Phase 1: Policy and Programme Management:

Traditional BC Approach

In short, this phase involves the set up and launch of a BC program. It “requires top management action, support, and commitment to set up, draft and review the policy relating to business continuity and the programme used to implement it” (GPG p.13). There are 31 steps in this phase according to the GPG.

How long might this take? Taking an artificially conservative approach, assume that the launch needs to involve only half of the executives and one executive assistant, and that each step only takes one hour to complete. The resulting duration estimate would look like this:

Table One: Estimated hours for Traditional Policy and Programme Management activities for SchizzleSoftware

Activity	# Steps	# Execs + Assistant	BC Professional	# Hours / Step	Total Hours
Establish BC Programme Policy	10	6	1	1	70
Define BC Programme Scope	4	6	1	1	28
Establish BC Programme Governance	6	6	1	1	42
Assign Roles & Responsibilities	2	6	1	1	14
[Establish] the BC Programme	9	6	1	1	63
		GRAND TOTAL:			217

How much value did the BC professional generate in 217 hours of BC work?

Optimistically, the 31 steps could provide the following types of value:

- **Awareness:** Just being aware that major incidents can happen, thinking about them and some possible reactions, and knowing that leadership will have a role to play in recovery will improve recovery capabilities at least a little
- **Mission:** It is important that everyone be on the same page with regard to what is important to the organization at time of disaster; if done well, some of these conversations should lay a foundation towards the belief that mission cohesion is important
- **RPC Improvements:** Perhaps the executives even got so excited that they each took initiative to improve at least two resources, procedures, or (crisis) competencies along the way

We can optimistically estimate value like this:

Table Two: Optimistic evaluation of Traditional Policy and Programme Management phase activities

Benefit	# Execs + Assistant	RVUs	Total RVUs
Awareness	6	1	6
Mission	6	1	6
RPC Improvements	6	2	12
		GRAND TOTAL:	24

Pessimistically, however, the executives might have been very angry that the BC practitioner took 186 hours of their time to sit in meetings, edit policy drafts, and help establish a BC program. In this pessimistic case, the total RVU count would be **zero** at best, and perhaps even a negative value at worst. Assume a total of 0 RVUs in this case.

What is most likely? Some executives will find some value in some activities that will provide some actual recovery value. We might estimate it like this:

Table Three: Most likely Evaluation of Traditional Launch Phase activities

Benefit	# Execs + Assistant	RVUs	Total RVUs
Awareness	3	1	3
Mission	3	1	3
RPC Improvements	3	1	3
		GRAND TOTAL:	9

How do we choose which estimate to use? One industry accepted solution in such cases is to use [PERT](#)¹² estimation method. Employing PERT, we estimate that SchizzleSoftware obtained a total of **10 RVUs in this phase** as $(0 + 4*9 + 24) / 6 = 10$.

Adaptive BC Approach

The Adaptive BC practitioner does not perform most of these Traditional launch activities. Having been hired on as a BC professional and told to do the job, the BC professional really just needs to know a few things from executives, such as:

- Is there anything or any threat in particular you're worried about?
- What are the most important things you want me to accomplish?
- What concerns do you have about launching a BC program?
- Which of your twenty departments is most critical and why (discuss at least three)?
- Are there any "landmines" I should know about?
- With whom do I work to schedule a meeting with each department director?
- How often would you like me to update you on progress?

Let us suppose the BC practitioner has a conversation with each of the 10 executives, keeping it under 30 minutes. So, the total time expenditure is estimated as:

Table Four: Estimated hours for Adaptive Policy and Program Management phase activities for SchizzleSoftware

Activity	# Execs	Exec Assistant	BC Prof	Hours	Total Hours
Program launch interviews	10		1	0.5	10
(Logistics and scheduling)		1	1	1	2
			GRAND TOTAL:		12

What value did the BC Professional generate in 12 hours?

While the BC Professional probably learned a lot of important things that s/he will be able to apply down the road, we must focus on the value that an activity actually provides to increase an organization’s recoverability. While I would argue that there is good reason to think that the value estimates might be even higher than those in the Traditional approach above, let us at least assume that they are equal, in that they made advances in the categories of awareness, mission, and RPC improvements. In this case, we can use the same estimations we used for Traditional BC valuation in the launch phase above.

Using the PERT estimation method again, we estimate that SchizzleSoftware obtained a **total of 10 RVUs** in this phase as $(0 + 4*9 + 24)/6 = 10$.

Policy and Program Management Phase Results

The Traditional BC approach provided 10 RVUs in 217 hours.

The Adaptive BC approach provided 10 RVUs in 12 hours.

Expressing the results as a percentage of Time to Value (TTV) we get:

- Traditional BC approach: $10 / 217 = .05\%$
- Adaptive BC approach: $10 / 12 = 83\%$

In this phase, Adaptive BC provided equal value roughly 18 times faster.

A Pause for Objections

Certainly, many will object to these back-of-the-napkin calculations. Here are a few expected objections, and a brief response; a fuller response would require another paper for each.

Wrong notion of “value”

Objection: Some of the activities involved in this first phase have some type of value different than what you have estimated.

Response: This is likely true, however, remember that value must be measured in terms of benefit to the customer. We are measuring value to customers and their organization’s goals, not value to a BC program. A critical lesson in product development, change management, and

business in general is that activity is only valuable in terms of the actual customer's behavior; consider the dot.com bust and subsequent advancements in Lean and Agile.

Wrong approach for a Small or Medium Sized Business (SMB)

Objection: The Traditional BC approach is better suited for large organizations

Response: Assuming this to be true for the moment, substituting a larger organization only makes things worse for the Traditional BC estimates.

The vast majority of BC practices do not have economies of scale.

The more departments the organization has, the more the BC practitioner has to perform the same activities. Think of the additional work the BC practitioner would need to perform and other departments s/he would need to involve if the hypothetical organization was just five times larger. Having to deal with the Legal department and set up additional steering and advisory committees alone will continue increase time in approximately the same 18:1 ratio above, if not higher.

Too many hours estimated for Policy and Programme Management

Objection: It would not take as many hours to perform the activities in this phase.

Response: The estimated hours were extremely conservative. Naturally, for better estimates, actual empirical research would be needed and welcomed.

“Recovery Value Unit” is not an accepted industry term

Objection: There is no such thing as a “Recovery Value Unit”.

Response: While this is indeed a new term, introduced for the purposes of this paper and future research, certainly the BC profession ought to provide value for its efforts, and such value ought to be quantifiable to some degree.

“Any roles involved in a project that do not directly contribute toward the goal of putting valuable software in the hands of users as quickly as possible should be carefully considered.”

— Stein Inge Morisbak

Phase Two: Embedding

Traditional BC Approach

“The goal of embedding business continuity is to ensure that it becomes part of business as usual across the organization...” (GPG p. 28). According to the GPG, this phase involves:

- “Raising awareness about business continuity through communication.
- Encouraging buy-in from interested parties.
- Ensuring required competencies and skills are in place.
- Ensuring appropriate training and learning opportunities are provided.” (GPG p.28)

This likely involves a good deal of work across the organization, work that requires “a collaborative approach from top management and the business continuity professional” (GPG p. 28) to ensure “that business continuity is considered by top management when the organization’s strategic plan is being developed or reviewed” (GPG p. 30). It requires that “all

individuals with roles and responsibilities for business continuity should have the appropriate education, training, and experience required for the development and implementation of the business continuity policy and programme...” (GPG p. 31).

I find it difficult to estimate the hours involved. To try and keep the number of estimated hours to a minimum, assume that the BC practitioner will only do one “round” of embedding phase activities across the organization, and s/he will keep it limited only to department heads and half of the executives. Having just written the policy document in the previous phase, the BC practitioner will skip work on updating the organization’s strategic plan.

Table Five: Estimated Hours for an initial Round of Traditional Embedding phase activities for SchizzleSoftware

Activity	Comm Dept + Exec Assistant Hours	# Dept Heads' Hours	# Execs' Hours	BC Prof	Total Hours
Raising awareness about business continuity through communication.	20	20 x 1	6 x 0.5	20	63
Encouraging buy-in from interested parties.	1	20 x 0.5	6 x 2	20	43
Ensuring required competencies and skills are in place.	1	20 x 2	6 x 2	20	73
Ensuring appropriate training and learning opportunities are provided	20	20 x 2	6 x 0.5	20	83
			GRAND TOTAL:		262

What about the delivered value for these 262 hours?

Assume that this initial round of training does not go into much depth and that the awareness activities would likely be rather general in nature. Assume that emotional support for the program such as executive buy-in does not qualify as an RVU, as it does not directly translate to improving recovery capabilities. Further assume that training does provide three RVUs per person, as it contributes to the improvement of, say, at least one procedure and two competencies. Finally, assume that those involved in the process were not so upset by having to dedicate their time to these Embedding efforts that they were unable to realize the value. With these assumptions, and skipping the individual steps for a PERT calculation, we might estimate the value as such:

Table Six: Most likely Evaluation of Traditional Embedding phase activities

Benefit	# Recipients	RVUs	Total RVUs
Awareness	26	1	26
Training	26	3	78
		GRAND TOTAL:	104

The Traditional BC approach provided 104 RVUs in 262 hours. Expressing the results as a percentage of Time to Value (TTV) we get: Traditional BC approach: $104 / 262 = 40\%$

Adaptive BC Approach

The Adaptive BC approach simply does not do these embedding activities as a separate phase, and very few of them as stand-alone activities at all. These embedding outcomes are a natural byproduct of the continuous improvement process when performed properly. By way of a brief explanation:

- Raising awareness: Awareness is generated organically with the successful engagement of the customer; there is no need to focus on this as a separate deliverable supported by specific corporate communications programs.
- Encouraging buy-in: The outcomes of the BC process should provide enough value that it requires no overt executive support other than the permission to perform the job and the money to purchase resources as warranted.
- Ensuring required competencies and skills are in place: This is a key activity but cannot be efficiently and effectively performed when separated either from the process of improving recovery capabilities or from the unique culture and individuals of each specific department.
- Ensuring appropriate training and learning: This too cannot be artificially disassociated from improvements and departmental culture.

Therefore, we must say that this category requires zero hours for an Adaptive BC approach and provides **zero** value, as it is simply “not applicable.”

Embedding Phase Results

The Traditional approach provided 104 RVUs in 262 hours. The Adaptive BC approach is not applicable. Expressing the results as a percentage of Time to Value (TTV) we get:

- Traditional BC approach: $104 / 262 = 40\%$
- Adaptive BC approach: NA

Phase Three: Analysis (BIA)

Traditional BC

For Traditional BC, this phase is comprised of the business impact analysis and a risk assessment. For the sake of brevity, let us assume that the organization has hired a Risk Manager to perform the risk assessment, and therefore the BC practitioner will not perform a risk assessment.

In the 2018 version of the GPG, there are now *four* different types of BIAs, and the organization may undertake any or all them. The GPG and ISO/TS 22317:2015 make it quite clear that this can be a very intensive and detailed undertaking indeed. While no formal study has been done to determine the average length of time it takes to conduct a BIA, anecdotal evidence suggests it requires between three and nine months, and sometimes over a year.

Perhaps it is best to adopt a middle-of-the-road estimate with regard to hours. Assume that the BC practitioner for *SchizzleSoftware* decides to perform *only two of the four possible BIAs*, that only three people from each department need to be involved, and that no executives need to participate.

The Initial BIA, the first type of BIA according to the GPG, takes 13 steps. Here are the desired high-level outcomes of the phase; these can serve as an indication of the level of detail and complexity involved in this phase:

- “A list of the organization’s products and services...
- The impacts over time related to the delivery failure of products and services.
- Estimated MTPDs [maximum tolerable period of disruption] for products and services.
- A list of processes and owners that contribute to the delivery of products and services.
- A breakdown of internal and external activity dependencies.
- A list of products, services, processes, and activities that have been excluded, along with the justification of the exclusion.” (GPG p. 44)

Again, it is difficult to estimate how many hours these activities require, so, again, I will simply provide for a best, conservative guess.

Table Seven: Estimated hours for an Initial BIA for SchizzleSoftware

Activity	# Dept Staff	# Dept Staff Hours	BCP Prof Hours per Dept	# of Depts	Total Hours
A list of the organization’s products and services	3	1	2	20	100
The impacts over time	3	1	2	20	100
Estimated MTPDs for products and services	3	1	2	20	100
A list of processes and owners that contribute to the delivery of products and services	3	1	3	20	120
A breakdown of internal and external activity dependencies	3	1	3	20	120
A list of products, services, processes, and activities that	3	.5	2	20	70

have been excluded, along with the justification of the exclusion					
			GRAND TOTAL:		610

This brings us to one of three other BIAs. Arguably the least complex of these is the Product and Service BIA, though it does require nine steps. The desired outcomes are:

- “Clarification or modification of the scope of the business continuity programme.
- A list of the organization’s prioritized products and services.
- Evaluation of impacts over time.” (GPG p. 45)

Assume that the BC practitioner elects to adopt the Product and Service BIA as the second type of BIA. An estimate of the hours required for a Product and Service BIA might look like this:

Table Eight: Estimated hours for a Product and Service BIA for SchizzleSoftware

Activity with Executives	# Execs + Exec Assist	# Hours	BCP Prof Hours	NA	Total Hours
Clarification or modification of the scope of the business continuity programme.	6	1	2		8
A list of the organization’s prioritized products and services.	6	3	6		24
Evaluation of impacts over time	6	1	2		8
Activity with Departmental Staff	# Dept Staff	# Hours	BCP Prof Hours per Dept	# of Depts	Total Hours
Clarification or modification of the scope of the business continuity programme.	0	0	0	0	0
A list of the organization’s prioritized products and services.	3	1	3	20	120
Evaluation of impacts over time	3	1	2	20	100
			GRAND TOTAL:		260

What is the output of these two BIA activities with regard to value? Why does a BC practitioner perform a BIA? GPG maintains that, “The BIA identifies the urgency of each activity undertaken by the organization by assessing the impact over time caused by any potential or actual disruption...” (GPG p.38) and that, “The business continuity professional uses the BIA to determine the organization’s business continuity requirements” (GPG p.38).

The key item that directly contributes to the recoverability of the organization is a full prioritization of all services. Everything else simply sets the stage for future phases of BC work – the BIA “will enable the organization to develop continuity solutions and plans that avoid reaching the MTPD” (GPG p. 43).

This being the case, the value proposition to the organization is rather straightforward. Based on the decisions made during these BIA meetings, those who participated in the discussions should have a good understanding of what products, services, and activities to recover or continue following a disaster, and in what order. As the BIA forms the cornerstone of most Traditional BC activities, let us give it a triple-weighting.

Table Nine: Most likely evaluation of BIA activities

Benefit	# Participants	RVUs	Total RVUs
Prioritization	66	3	198
		GRAND TOTAL:	198

Adaptive BC

One of the ten principles of the 2017 [Adaptive BC Manifesto](#)¹³ is to omit the BIA. Practitioners should eliminate the BIA because:

- “The goal of quantifying the impact of disaster is likely a non-starter from the beginning. Numerous commentators have identified numerous deep flaws at the core of the BIA practice...
- Executive leadership can be trusted to identify critical services based on their experience and knowledge of the organization... and therefore can set general direction and prioritization for preparedness planning.
- The proper sequence to restore services at time of disaster will depend on the exact nature of the post-disaster situation, a situation that cannot be predicted ahead of time. Because the organization must be flexible and responsive to the situation as it unfolds in real time, recovery time targets and a prescriptive recovery sequence should not be predetermined.” (Adaptive BC Manifesto, p. NN) (See also: [“What was the BIA?”](#)¹⁴)

While nothing replaces a BIA in the Adaptive BC approach, the Adaptive BC professional should facilitate a discussion with department staff to determine which services are of value in a post-disaster situation, and why. Note that this is not the same as a prioritized list. Military organizations sometimes call this, “general intent.”

For the sake of more easily comparing time and value estimations, we can look to the [SIPOC](#)¹⁵ model from SixSigma as a way for the BC practitioner to guide these facilitated discussions, and for us to estimate hours. Note that SIPOC stands for suppliers, inputs, process, outputs, customers, and can usually be completed in 20 to 60 minutes.

Using the same number of participants for this estimate as we did for the Traditional BIA estimate above, our results might look like:

Table Ten: Estimated Hours for a SIPOC for SchizzleSoftware

Activity	# Participants	# Hours	BC Prof	# Hours	Total Hours
SIPOC with Departments	60	1	1	1.5 x 20	90
SIPOC with Executives	6	.5	1	1 x 6	9
			GRAND TOTAL:		99

Adaptive BC posits that a strict recovery prioritization of products and services is unnecessary at best, and harmful at worst. What is important is that as many people as possible understand what is important at time of disaster, both inside and outside of their department, and why. Everyone should understand the “general intent” of what they need to do following a disaster. Equally important is enabling individuals to take action and make decisions in a post-disaster environment without direct instruction from leadership.

To keep the main comparisons in the paper as equivalent as possible, we can use the same valuation score as we did with Traditional BC in this phase, despite the fact that I believe the Adaptive BC approach actually provides additional value.

Table Eleven: Most likely Evaluation of SIPOC Activities

Benefit	# Participants	RVUs	Total RVUs
General Intent and Empowerment	66	3	198
		GRAND TOTAL:	198

Analysis Phase Results

The Traditional BC approach provided 198 RVUs in 870 hours.

The Adaptive BC approach provided 198 RVUs in 84 hours.

Expressing the results as a percentage of Time to Value (TTV) we get:

- Traditional BC approach: $198 / 870 = 23\%$
- Adaptive BC approach: $198 / 84 = 236\%$

In this phase, Adaptive BC provided equal value roughly 10 times faster.

Phases Four and Five: Design and Implementation

Traditional BC Approach

These two phases involve the design and implementation of recovery and continuity strategies. There are at least 14 steps for the design phase and another 26 for the implementation phase. This is a very complicated process, involving all levels of the organization, with a focus not only on planning, but also the “documented plans” (GPG p. 75) and regular approval from senior management of strategies, response structures, and solutions.

As a detailed estimation would be quite lengthy, let us make some assumptions for a high-level estimation of hours. As noted above in our hypothetical situation, the BC professional will only perform a first pass through these two phases. Assume that each of the 30 steps takes only one hour of preparation and two hours of execution; note that this is a very conservative estimate, and likely would require significantly more time. Further assume that only five executives (and an executive assistant) and four representatives are required from each department.

A final note: The last step for the Response Structure sub-phase as well as the Developing and Managing Plans sub-phase involves exercising. I have assumed for the sake of time estimation that this step merely indicates the need to plan out an approach for exercises, and not the actual exercise itself, as phase six (Validation) of the GPG specifically calls out exercises.

Table Twelve: Estimated hours for Design and Implementation for SchizzleSoftware

Steps Requiring Executives	# Execs + Exec Assist	# Hours	BC Prof Hours	Total Steps	Total Hours
Design 1, 7, 8	6	2	3	3	45
Risk and Threat 5	6	2	3	1	15
Implementation Process 1, 2, 3, 6, 7, 8	6	2	3	6	90
Develop and Manage Plans 1	6	2	3	1	15
Activity Requiring Departmental Staff	# Dept Staff (4x20)	# Hours	BC Prof Hours (per Dept)	Total Steps	Total Hours
Design 2, 3, 4, 6	80	2	3	4	700
Risk and Threat 1 - 4	80	2	3	4	700
Implementation Process 4, 5, 9, 10, 11	80	2	3	5	860
Develop and Manage Plans 2-15	80	2	3	14	2,300
Activity Requiring Both Executive and Departmental Staff	# Staff	# Hours	BC Prof Hours	Total Steps	Total Hours
Design 9	86	2	3	1	232
Risk and Threat 6	86	2	3	1	232
Implementation Process (NA)					
Develop and Manage Plans (NA)					
Grand TOTAL:					5,189

As always, the question of how to assess the value of these activities is a difficult one. For the Design and Implementation phase, ISO22301 may provide some guidance. Section 8.3 of this ISO standard outlines a number of items deemed essential for a successful business continuity strategy. Sections 8.4.1 through 8.4.4 identify 26 beneficial outcomes of the BC plan.

How many of the 30 Design and Implementation steps will actually achieve value for each of the 26 beneficial outcomes, particularly if the BC practitioner for *SchizzleSoftware* is only

making a first pass through these activities? Once again, we must make a good deal of assumptions with very little research data.

To keep it simple, particularly by way of comparison between Traditional and Adaptive BC approaches, simply assume that every one of the 26 outcomes was addressed at least minimally. Let us assign one RVU to each of the 26 outcomes for each of the 20 departments.

The following three ISO22301 outcome items seem to provide value only at the organizational level, and not at the departmental level:

- 8.4.2 a) identify impact thresholds that justify initiation of formal response
- 8.4.3 a) detecting an incident
- 8.4.3 d) receiving, documenting and responding to any national or regional risk advisory system or equivalent

Therefore, for the purpose of RVU calculations, assume that these three items provide value only at the organizational level.

Based on these assumptions, our estimates might look like this:

Table Thirteen: Most likely evaluation of Design and Implementation activities for SchizzleSoftware

Benefit	# Benefits	RVUs	# Depts	Total RVUs
8.4.1 General	6	1	20	120
8.4.2 Incident Response	5	1	20	100
8.4.3 Warning and Communication	5	1	20	100
8.4.4 Business Continuity Plans	7	1	20	140
8.4.2.a, 8.4.3.a, 8.4.3.d	3	1	1	3
			GRAND TOTAL:	463

Adaptive BC Approach

Recall that the Adaptive BC professional has now met with each department for one hour and used the SIPOC approach as a tool to understand what they do, why they do it, and how they would begin to respond to a major incident.

At this point, in terms of designing and implementing continuity strategies, the Adaptive BC professional would partner with departmental representatives to create a portfolio of recovery and continuity strategies for three impacts: Loss of people, locations, and things.¹ This involves strategic and tactical strategies and actions to improve the resources, procedures, and (crisis) competencies associated with each of these impact scenarios.

¹ More specifically, the Adaptive BC Professional would set the *aperture* for BC preparedness activities. See, Lindstedt and Armour, 2017, *Adaptive Business Continuity: A New Approach*, p. nn.

The practitioner would need at least two one-hour meetings with four representatives from each department, and one hour of preparation and follow-up time for each meeting. Also assume that at least half of the participants would be willing to spend one hour to make some improvements following the meeting. In addition, the practitioner would likely want to check in briefly with executives at the end of these improvement sessions, so assume a half-hour meeting with each participating executive and the executive assistance, along with one hour to prepare each of these meetings.

Table Fourteen: Estimated hours for Adaptive BC Design and Implementation efforts for SchizzleSoftware

Activity	# Participants	# Hours	BC Prof	# Hours	Total Hours
Work with Departments	80	2	1	2 x 20	200
Independent Improvements	40	1	0	0	40
Touch-base with Executives	6	0.5	1	1 x 6	9
				GRAND TOTAL:	249

As the end goal of the Adaptive BC practitioner is always the continuous improvement of recovery capabilities, we need to estimate value in accord with improvements of those capabilities. For a source of estimation categories, we can look to The RPC Model of Organizational Recovery as presented in [“Measuring Preparedness and Predicting Recoverability”](#)¹⁶ and manifested in [The Readiness Test™](#).¹⁷

For an estimation of value, we can use the 21 items found in the high-level BC assessment from The Readiness Test™. As we did for the Traditional BC evaluation, assume that the work successfully addressed every one of the 21 outcomes at least minimally. Assign one RVU to each of the 21 outcomes for each of the 20 departments. Assume also that each participating executive receives at least one-half of an RVU for half of the 21 items.

Table Fifteen: Most likely evaluation of Adaptive BC Design and Implementation efforts for SchizzleSoftware

Benefit	# Benefits	RVUs	# Depts	Total RVUs
Resource Improvements	8	1	20	160
Procedure Improvements	7	1	20	140
(Crisis) Competency Improvements	6	1	20	120
Executive-centered Improvements	10	0.5	5	25
			GRAND TOTAL:	445

Design and Implementation Phases Results

The Traditional BC approach provided 463 RVUs in 5,189 hours.

The Adaptive BC approach provided 445 RVUs in 249 hours.

Expressing the results as a percentage of Time to Value (TTV) we get:

- Traditional BC approach: $463 / 5,189 = 9\%$
- Adaptive BC approach: $445 / 249 = 179\%$

In this phase, Adaptive BC provided equal value roughly 20 times faster.

Phase Six: Validation

Traditional BC Approach

The final phase of in the Traditional BC lifecycle as outlined in the GPG is validation. This phase focuses on exercises to “ensure that the business continuity solutions and response structure reflects the size, complexity, and type of the organization and that the plans are current, accurate, effective, and complete” (GPG p. 87). The Developing and Exercise Programme sub-phase requires ten steps, including “review and assess current risks and threats,” creating “an exercise schedule,” submitting “to top management for approval,” and the requirement to “identify any training requirements for exercise participants or planners, and integrate them into the exercise programme” (GPG p. 89). After creating a “programme” specifically to manage exercises, the BC practitioner then begins Developing an Exercise as the next sub-phase. This takes six steps and includes conducting the exercise itself.

“A value-added step in a process is defined by three characteristics. First, the step must be something that the customer is willing to pay for. Second, the step must directly change the form, fit, or function of something to produce a product or service. The final characteristic of a value-added step is that it is so important that it must be done right every time to successfully produce the intended product or service.”

— Robert E. Hamm Jr.
Continuous Improvement; Values, Assumptions, and Beliefs for Successful Implementation: It's All About the Culture

Importantly, this phase also includes several other sub-phases in addition to exercises. GPG requires an additional 12 steps for an audit review. Further, there are 11 steps for Quality Assurance and Performance Appraisal, and nine for Maintenance. For the purposes of a shorter treatment of the subject and ease of estimation and comparison, assume that these 32 steps are *out of scope* for the BC professional's first pass with SchizzleSoftware.

Finally, there are six steps required for a Self-Assessment of the effectiveness of the BC program. As I have argued [elsewhere](#),¹⁸ it is difficult, if not impossible, for Traditional BC practitioner to identify actual “measures for the business continuity programme against which performance can be assessed” (GPG p.

101). Whereas the Adaptive BC approach is founded on measuring resources, procedures, and competencies, thus providing a strong basis for valuable metrics and KPIs, Traditional BC has only a collection of disparate practices and deliverables for “yes/no” and “check-the-box” documentation. Therefore, I will not include this sub-phase in the estimate of hours and value, noting only that this is another area where real value may be found only in the Adaptive BC approach.

As with the last few phases of the Traditional BC approach, this phase could be executed in a manner both detailed and complicated. Assume that each step of the Developing and Exercise Programme sub-phase takes the BC practitioner an average of four hours to prepare, and that any of these steps requiring management involvement takes 30 minutes with five executives and the executive assistant and one hour of preparation.

Table Sixteen: Estimated hours to Develop an Exercise Program for SchizzleSoftware

Activity	# Execs + Exec Assist	# Hours	BC Prof	# Steps	Total Hours
Develop an exercise program	0	4	1	7	28
Obtain executive approval	6	1.5	1	3	31 (rounded)
			GRAND TOTAL:		59

Planning and executing an exercise for twenty departments could be a daunting task. Again, to simplify the estimation, assume that it takes the BC professional only one hour for each of the three steps leading up to conducting an exercise, and one hour to conduct the exercise and “debrief the participants immediately after the exercise” (GPG p. 93). Assume that half of the staff for each department will participate. Assume it will take the BC professional and half of the participants only one hour to “follow-up to address any issues raised by the exercise and take corrective action...” (GPG p. 93). Finally, assume it take the BC professional only one hour to “report the outcome and lessons learned” from each exercise.

Table Seventeen: Estimated hours to Develop and Conduct an Exercise for SchizzleSoftware Departments

Activity	# Participants	# Hours	BC Professional	# Steps	Total Hours
Develop exercises	0	3 x 20	1	3	180
Conduct and debrief exercises	10 x 20	1	1	1	220
Follow-up and address issues	5 x 20	1	1	1	120
Report the outcome	0	1 x 20	1	1	20
			GRAND TOTAL:		540

What is the measure of value provided by 599 hours of exercise work? The GPG indicates that there are seven beneficial outcomes, from “confirmation that personnel are familiar with their roles, responsibilities, and authority” to “ideas for further exercises and scenarios relevant to the organization” (GPG p. 95). Assuming that every participant from every department obtained at least one point of value for each of these benefits, an estimate of value might look like this:

Table Eighteen: Most likely evaluation of Traditional BC Validation Activities

Benefit	# Benefits	RVUs	# Depts	Total RVUs
Exercise programme	7	1	20	140
			GRAND TOTAL:	140

Adaptive BC

The Adaptive BC approach does not require special steps to establish an exercise program for the organization. Exercises are one of many activities that the Adaptive BC professional simply performs as s/he works to continuously improve recovery capabilities. In fact, many Adaptive BC professionals choose to facilitate an exercise as their *first* step in beginning continuity work with a department.

As this is the Adaptive BC professional’s first pass through with SchizzleSoftware, s/he will take one of three approaches to selecting an exercise scenario for each department:

1. Ask departmental representatives if there is any particular scenario they would like to use, perhaps based on a past incident or current concerns.
2. Select a scenario based on the information obtained during initial conversations with the department.
3. Use an “instant exercise” approach where one or more scenarios are randomly generated using dice, playing cards, or software.

The Adaptive BC professional will use existing materials and templates, thus requiring an average of only 30 minutes (and probably less) to prepare each exercise.

Assume, as we did with the Traditional BC approach to exercises above, that it takes one hour to conduct an exercise and debrief the participants. Assume that half of the staff for each department will participate and that it will take the BC professional and half of the participants only one hour to follow-up and make initial improvements following the exercise. With these assumptions, the effort estimation may look like this:

Table Nineteen: Estimated hours to Develop and Conduct an Exercise for SchizzleSoftware Departments

Activity	# Participants	# Hours	BC Prof	# Steps	Total Hours
Develop exercises	0	.5 x 20	1	1	10
Conduct and debrief exercises	10 x 20	1	1	1	220
Follow-up and make improvements	5 x 20	1	1	1	120
			GRAND TOTAL:		350

Recall, as with the previous phase, we need to estimate value in accord with improvements of capabilities. Again, we can use the 21 items found in the high-level BC assessment from The Readiness Test™. As we did for the Traditional BC evaluation, assume that the work successfully addressed every one of the 21 outcomes at least minimally, especially as half of the participants will spend at least one hour following the exercise to make immediate improvements to their department’s capabilities. Assign one RVU to each of the 21 outcomes for each of the 20 departments.

Table Twenty: Most likely evaluation of Adaptive BC Exercise efforts for SchizzleSoftware

Benefit	# Benefits	RVUs	# Depts	Total RVUs
Resource Improvements	8	1	20	160
Procedure Improvements	7	1	20	140
(Crisis) Competency Improvements	6	1	20	120
		GRAND TOTAL:		420

Analysis Phase Results

The Traditional BC approach provided 140 RVUs in 599 hours.

The Adaptive BC approach provided 420 RVUs in 350 hours.

Expressing the results as a percentage of Time to Value (TTV) we get:

- Traditional BC approach: $140 / 599 = 23\%$
- Adaptive BC approach: $420 / 350 = 120\%$

In short, Adaptive BC provided equal value roughly 5 times faster.

Note, however, that we ignored a number of Validation phase steps in our calculations that were suggested by the GPG; it is likely that including these steps in RVU and TTV calculations would indicate even better TTV results for Adaptive BC.

Outcome and Implications:

At the end of the estimation, here are the grand totals:

- The Traditional BC approach provided 915 RVUs in 7,138 hours.
- The Adaptive BC approach provided 1,073 RVUs in 710 hours.
- Expressing the results as a percentage of Time to Value (TTV) we get:
 - Traditional BC approach: $915 / 7,138 = 13\%$
 - Adaptive BC approach: $1,073 / 710 = 151\%$

Overall, the Adaptive BC approach provided equal value roughly 11 times faster than Traditional BC practices.

A summary matrix appears in Appendix A.

Putting dollar amounts to these results may prove particularly illuminating. Assume that each hour of work effort costs a blended rate of \$100. That means the cost to the organization to set up a BC program and perform an initial pass of preparedness activities cost:

- \$713,750 for Traditional BC
- \$71,000 for Adaptive BC

In all likelihood, the Traditional BC approach would actually cost more than the estimated \$713,750, as a fair amount of the 7,138 hours are spent with *executives* whose time is certainly more expensive than others. In fact, if we separate out the time required specifically for executive involvement and use a slightly higher blended executive rate of \$500 per hour, the total cost of the Traditional BC approach rises to \$904,350 (Adaptive BC rises to \$82,200).

For a hypothetical organization of 401 employees and 10 executives, at a blended staff rate of \$100 per hour and a blended executive rate of \$500 per hour, an Adaptive BC provides a cost savings of \$822,150

Finally, based on the \$100 per hour blended rate above, we can calculate a Cost to Value (CTV) for each recovery value unit (RVU). What does it cost to obtain one RVU for the organization?

- \$780.05 / RVU: Traditional BC
- \$66.17 / RVU: Adaptive BC

A single “unit” of recovery value can be gained eleven times faster with an Adaptive BC approach – for this hypothetical organization, that is a savings of \$ 713.88 per RVU

Using the higher blended executive rate of \$500 per hour, we can calculate a Cost to Value (CTV) for each recovery value unit (RVU) as:

- \$988.36 / RVU: Traditional BC
- \$76.61 / RVU: Adaptive BC

The results of this analysis, if at least generally accurate, have critical and far-reaching implications for the preparedness industry. As an exposition of these implications would require a separate treatment for each, this paper will only briefly highlight some of the more important implications for future research, commentary, and academic exploration.

Practice Implications

Clearly, if the BC practitioner can provide equivalent value to the customer in a fraction of the time using a new approach, such an approach is desirable. Adaptive BC, or a similar non-linear approach that focuses on partnering with the customer in rapid iterations of development and delivery of value, should be preferable to Traditional BC practices. As [Occam's razor](#),¹⁹ the [Pareto principle](#),²⁰ and even simple common sense suggest, all things being equal, the simpler solution is the preferred one.

Approaches like Adaptive BC are able to provide value precisely because they incorporate methodologies from related disciplines such as Agile PM, Lean, and Six Sigma, creating a close partnership with the customer to provide value in rapid iterations. The general practice of BC must strive to eliminate overhead, inefficiencies, and activities that serve only to bolster legacy practices, focusing instead only on those activities that directly contribute to improving the organization's recovery capabilities.

Practitioner Implications

Executive dissatisfaction, lack of participant enthusiasm, and core problems with Traditional practices [are evident](#).²¹ While change is often difficult, the BC practitioner might strongly consider adopting new practices that are more in line with the way organizations expect to conduct business. Project managers and software developers continue to struggle with the move to an Agile mindset, and organizations are just recently exploring the benefits of Lean approaches to operations such as DevOps – but the evidence of their successful outcomes has become too overwhelming to ignore, and they are employing these approaches despite the uncomfortable change. The evidence for Adaptive BC successes and its efficiencies may cause a similar path for change.

“Simplicity – the art of maximizing the amount of work not done – is essential.”

— Agile Principle

BC Support Organization Implications

BC support organizations such as DRI, BCI, and even Gartner have suggested few improvements in many years. As the *Adaptive BC Manifesto* posits, “Despite tremendous revolutions in technology, organizational practice, and global business in the last fifteen years, traditional BC methodology has become entrenched. It has made only small, incremental adjustments, focusing increasingly

on compliance and regulations over improvements to organizational readiness” (*Adaptive BC Manifesto*, p. 1). Worse, these organizations [may be reducing](#)²² even this minimal support for BC professionals, focusing their resources and attention on resilience, cyber security, and community preparedness instead. To combat the existing problems within Traditional BC practices, BC support organizations should take a hard look at alternate approaches such as Adaptive BC.

Research and Academic Implications

This paper suggests new lines of research and academic investigation. The concept of a Recovery Value Unit is new to the continuity profession. Explorations into Time to Value have gone entirely unaddressed. Actual measures of value and duration are new. If business continuity is to become a well-founded discipline, or a discipline at all, empirical research and formal analysis must play a critical role. The profession needs to learn not about “best” practices, but actual *proven* practices. Finally, given the importance of research and formal analysis to discover the most effective and efficient practices for the organizations in our communities, public and private organizations should consider providing funds and grants in lines with such work.

Value-Type Implications

Arguably, recovery value is the primary value sought by the organization when it undertakes a BC program. This is particularly so if commentators are correct in thinking that a BC program offers little or no financial return on investment. But clearly there are other, secondary types of value. A 2012 article by Continuity Central, “The Benefits of Business Continuity: A Summary”,²³ outlines ten potential secondary benefits, including “customer confidence,” compliance benefits,” and “competitive advantage.” There are other possible value-types as well, for example, those that provide value back to the program itself and therefore reinforce the likelihood that the problem will continue. We might call these tertiary values, consisting of measurable²⁴ indicators such as executive buy-in, participant engagement, participant satisfaction, and percentage of approved funding for BC-related resource improvements. One could make a long list of additional, potential values that might be generated, directly or indirectly, by BC work.

While this paper examined only estimates of TTV for the primary value of recovery, scholars could perform analyses of secondary, tertiary, and other potential values. The main question for investigation in this case would be: Does an Adaptive BC or Traditional BC approach provide more and/or faster non-primary value (and to what degree)? Theoretically, if one could assign weighting to these non-primary values, scholars could determine something like an ideal algorithm for BC practices targeting specific outcomes.

Public Policy Implications

Why should any organization waste efforts where not warranted? As both Lean and Agile state simply as a matter of principle: Eliminate waste. Now that related disciplines have opened new avenues of practice, BC approaches can make use of these improvements. Government

programs, public policy, and preparedness work in general should be guided by the most efficient use of public resources. Moreover, there may be a rather straightforward ethical argument for the adoption of approaches like Adaptive BC in favor of Traditional and legacy BC practices.

Scaling Implications

What if the hypothetical organization used in this paper were larger? As noted above, there are very few if any economies of scale in BC activities. This means that, in general, costs increase linearly with the size of the organization. Increasing the size of the hypothetical organization by five times to one hundred departments, and working with still only six executives, yields the following results based on the estimating methods above:

- | | |
|--|--|
| • Traditional BC Approach: | • Adaptive BC Approach: |
| ○ Total Hours: 33,378 | ○ Total Hours: 3,430 |
| ○ Total RVUs: 3,635 | ○ Total RVUs: 3,953 |
| ○ Time to Value: 11% | ○ Time to Value: 115% |
| ○ Total Cost (at \$100 / hour):
\$3,337,750 | ○ Total Cost (at \$100 / hour):
\$343,000 |
| ○ Cost per RVU (at \$100 / hour):
\$918.23 | ○ Cost per RVU (at \$100 / hour):
\$86.77 |

These results show that the difference in Time to Value between the two approaches remains about the same, with the Adaptive approach providing value 10.5 times faster, and thus providing 10.5 times the savings (\$2,994,750).

Regulatory and Audit Implications

Along these lines, regulatory, compliance, and audit requirements should shift focus away from individual activities and deliverables and toward what actually matters in any business continuity effort: Improvement of recovery capabilities. Through no fault of their own, auditors have inherited a set of standards and guidelines based largely and exclusively on Traditional BC approaches. But now, advances in related disciplines and several decades of experience in the BC field should allow better measures of preparedness. Regulators now have the opportunity to take a step back from what they have been doing to assess the value of alternate approaches.

“The difference between outputs and outcomes is... fundamental and profound.”

--Deborah Mills-Scofield
HBR 2012

Human Implications

As electronic storage capacity and processing capabilities double^{xxv} roughly every 18 months, and an increasing number of once-human activities are being automated through robotics and artificial intelligence, Traditional BC practices are becoming steadily outdated. Rapid iteration is replacing drawn-out requirements gathering. High availability is making recovery planning for individual systems unnecessary. Automated discovery and Hadoop tools are eliminating the need for first-level analysis. Many of the investigative practices of Traditional BC will become obsolete.

An Adaptive BC approach allows the professional to focus on the mission, culture, and individuals within every department of any organization. Each particular department has its own way of doing things, and recovery resources, procedures, and competencies that work for one department may not work for another. The factors allowing for the highest probability of recovery for a steam generation plant in North America will not be the same for a child care center, hotel, shipping and receiving dock, trading floor, or many other services in locations across the globe. Approaches like Adaptive BC may better equip the BC practitioner to prepare our organizations in the coming decades.

Appendix A: Summary of Hours and Value Estimations

	Traditional BC Approach		Adaptive BC Approach	
	Hours	Value	Hours	Value
P&P Mgt	217	10	12	10
Embedding	262	104		
Analysis	870	198	99	198
Design and Implement	5,189	463	249	445
Validation	599	140	350	420
TOTAL:	7,138	915	710	1,073

About

David Lindstedt, PhD, PMP, CBCP is a writer, speaker, consultant, developer, and unconventional business continuity thinker.

Along with colleague Mark Armour, he is the co-founder of AdaptiveBCP.org and co-author of [*Adaptive Business Continuity: A New Approach*](#).

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- ¹ <https://ems-solutionsinc.com/wp-content/uploads/2013/02/The-True-Value-of-Business-Continuity-Shifting-from-ROI-to-VOI.pdf>
- ² <https://www.drj.com/myblog/business-continuity-and-return-on-investment.html>
- ³ <https://www.thebci.org/news/continuity-insights-2018-highlights-and-perspectives.html>
- ⁴ <https://www.manufacturing.net/article/2012/05/does-preparedness-have-roi-part-1> and <https://www.manufacturing.net/article/2012/05/does-preparedness-have-roi-part-2>
- ⁵ http://www.adaptivebcs.com/docs/RPC_Lindstedt.pdf
- ⁶ <http://bit.ly/2LuWrPg>
- ⁷ <https://amzn.to/2HzjR2J>
- ⁸ C.F. https://www.amazon.com/dp/B074G5T77M/ref=cm_sw_r_cp_ep_dp_zFPcBbT53JVRK
- ⁹ <https://www.agilealliance.org/agile101/>
- ¹⁰ https://prezi.com/0hfbn_vkkobc/preparedness-and-recoverability-metrics/
- ¹¹ <https://www.thebci.org/training-qualifications/good-practice-guidelines.html>
- ¹² <https://www.techrepublic.com/blog/it-consultant/use-pert-technique-for-more-accurate-estimates/>
- ¹³ <http://www.adaptivebcp.org/manifesto.php>
- ¹⁴ <https://www.continuitycentral.com/index.php/news/business-continuity-news/2113-what-was-the-bia>
- ¹⁵ <https://www.isixsigma.com/tools-templates/sipoc-copis/sipoc-diagram/>
- ¹⁶ <http://www.readinessanalytics.com/docs/MeasuringPreparednessLindstedt.pdf>
- ¹⁷ <https://www.readinesstest.com/>
- ¹⁸ http://www.adaptivebcs.com/docs/RPC_Lindstedt.pdf
- ¹⁹ https://en.wikipedia.org/wiki/Occam%27s_razor
- ²⁰ https://en.wikipedia.org/wiki/Pareto_principle
- ²¹ <https://www.linkedin.com/pulse/sinking-ship-business-continuity-op-ed-piece-david-lindstedt/>
- ²² *ibid.*
- ²³ <http://www.continuitycentral.com/feature0961.html>
- ²⁴ https://acta.mendelu.cz/media/pdf/actaun_2015063031061.pdf
- ^{xxv} <https://www.investopedia.com/terms/m/mooreslaw.asp>

Note: All web links in the end notes were viewed and verified on 6/19/18.