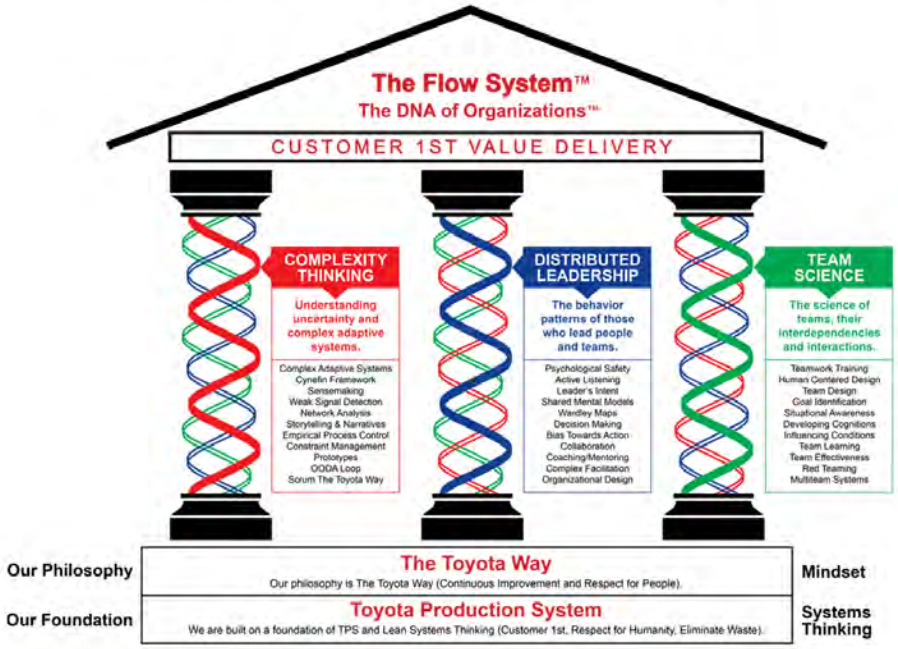
The FLOW SYSTEM

THE EVOLUTION OF AGILE AND LEAN THINKING IN AN AGE OF COMPLEXITY



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By

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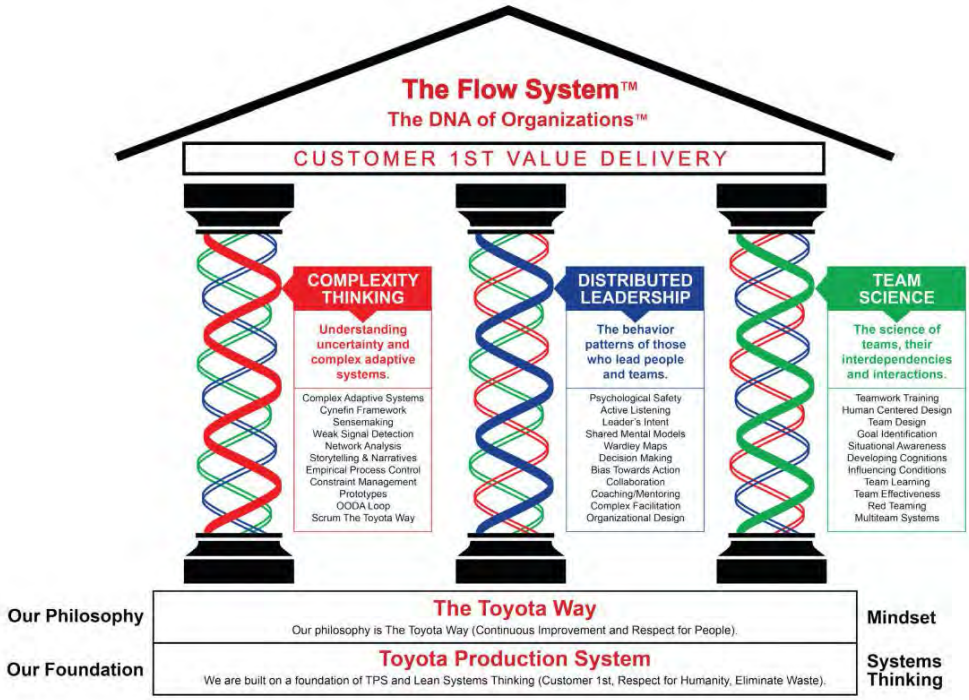

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Foreword

By Professor Dave Snowden, creator of the Cynefin Framework, chief scientific officer of Cognitive Edge, and director of the Cynefin Centre

We live in complex times, verging on the chaotic. The coronavirus pandemic has, at least in the short to medium term, radically changed the way we view the world and the body politic. A former British prime minister once coined the phrase "There is no magic money tree" to justify an economic policy of austerity, but faced with this crisis of unprecedented scale, entire *magic money forests* suddenly have cropped up in most national states. It is a truism to say that nothing will be the same again, but the nature of the difference is far from clear. Will we genuinely rethink the nature of our interactions with our fellow human beings and, more important, the planet, or will we simply lurch back to some dystopian populism and await the next crisis? The only thing that is certain about highly complex situations is that all interventions will produce unintended consequences both good and bad. Our ability to disrupt the bad and exploit the good is a measure of our resilience at all levels.

The Flow System's Triple Helix of Flow provides many of the tools and ways of thinking we will need to do that. It is *agile* without being doctrinaire about *Agile,* and its Toyota origins show in that it doesn't reject what we have done in the past, but rather finds the boundaries of those practices and then identifies new approaches for when those boundaries have to be crossed. Rethinking the nature of teams, distributing leadership, and understanding the science of uncertainty in human systems, anthro-complexity shows a willingness to go beyond a single propriety method to one that collects different methods, tools, and philosophies that are diverse enough to create resilience, but coherent enough to give an adaptive sense of direction. In anthro-complexity, we start journeys with a sense of direction, open to novel discoveries and adaption as the nature of the system with which we are dealing unfolds. This is a paradigm shift from the engineering approach that has dominated the past few decades in which futile attempts have

been made to eliminate rather than embrace uncertainty. Following are some of the fairly easily understood heuristics of managing in uncertain times:

1. Centralize coordination and constraint management but distribute decision making. You simply cannot control the diversity of decisions that have to be made, and made in shortened time scales, so building trust into teams and into process will allow you to do this; coordination is the role of leadership and the ability to sense weak signals and quickly allocate resource to where it is most needed.
2. Communicate by engagement, and use your employees and networks as a distributed human sensor network to increase the diversity not only of your situational assessment but also of future scenarios. The familiar platitudes of employee engagement do not apply, if they ever did. Your staff are *entangled* with the world, your organization, and its future. Just as bramble bushes in a thicket[1] attempting to untangle what has emerged over time will simply break things, it is better to take advantage of its connections—you don't have to understand all of its many threads to take advantage of the fruit it bears.
3. Map and manage the constraints in play and understand that *enabling constraints* can reduce the cost of energy flows within the organization. Some constraints are dark, and you can see the impact but can't see the source; some constraints can be changed; and others, at least for the moment, are a given. Recognize the reality of what you can change, and more critically, identify the areas you can monitor the impact of change and rapidly redeploy resources to amplify the good and disrupt the bad.

Of course, there are many things you should not do, but to enumerate those would take a book in its own right. Two points are critical:

1. Avoid using the occasion to peddle a single solution or idea. Most of what we have done in the past has value, it was just not universal in its nature, and your bright new shiny idea will have its limits. Use what worked before up to the boundaries of its applicability and then experiment (without ideological fervor) on the other side of that boundary.
2. Don't ignore context. I've lost count over the years of the number of times case studies of successful organizations were used, and abused, to justify some new management theory. Understand the basics of biology: the first into a new sector is likely to be the apex predator and the rest of the food chain will organize around it. The success of any one entity may mask inefficiencies that will be exposed as the context shifts. You have your own path to follow. Learn from others but do not use the retrospective coherence of an airport book to constrain you to a recipe, or worse yet, a set of platitudes.

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1 This phrase originally was used by Alicia Juarrero to describe a complex system.

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Preface

A lot has happened in just a short amount of time. We wrote this book during the summer of 2019. The book is a compilation of years of research from the fields of complexity, leadership, organizational theory, psychology, and team science. It draws on years of experience in the disciplines of engineering, military safety, and strategy throughout various organizations involved in implementing and practicing agile and lean methodologies. Since the end of August 2019, however, several events have unfolded that sparked a global pandemic from the COVID-19 virus, causing a complex environment to emerge around the globe. This new complex environment will be with us for some time. In response to the COVID-19 outbreak, a preface was warranted before this book went to press to position The Flow System within the current complex environment, in which we will be living moving forward. For context, the following events provide a review of the complex environment that had surfaced in this short time frame:

- Originating in Wuhan, China, the SARS-CoV-2 coronavirus emerged toward the end of 2019. On December 31, 2019, China alerted the World Health Organization of an outbreak due to SARS-CoV-2. This virus had then proceeded to spread globally into what is now known as the COVID-19 pandemic and had since spread to 70 other countries (Scripps Research Institute, 2020).
- Across the United States, educational institutions have shut their doors indefinitely to students. These educational institutions have transitioned to online delivery to complete this year's academic curricular obligations. The impact that this transition will have on broader educational institutions will become irreversible, as this transition could be more permanent than most may be willing to consider.
- Manufacturing facilities have come to a halt, with China shutting down toward the end of 2019 and other parts of the globe shutting down in the early

part of 2020. The COVID-19 pandemic has completely halted an entire supply chain network for manufacturing around the world. Even if China was able to begin ramping up their facilities, as they were the first hit with the virus, given the probability that they would be the first to recover, the rest of the world remains inoperable. Estimates are predicting that these supply networks will not be up and running until, at best, fall 2020. Unfortunately, most estimates dismiss the potentiality of a reoccurrence or relapse of COVID-19. Corporations are having to find different suppliers other than China; they now are looking to local manufacturers and suppliers. Reliance on China is likely to be reduced moving forward as corporations will need to have in place multiple networks in case one supplier is unable to deliver: "Redundancy is built into that diversified supplier base, which enables a quicker rebound" (n.a., 2020: Long Road). These dynamics place the global supply chain network as a complex adaptive system that will look quite different once we move beyond the COVID-19 pandemic.

- Many corporations are repurposing their facilities to provide products that are in short demand, especially those deficits found in healthcare. Some of these include Dior, who repurposed their facilities in Italy to produce hand sanitizers (*Knowledge@Wharton*, 2020). Tesla, Ford, and GM announced repurposing their facilities to provide ventilators and other medical equipment (Cormack, 2020). Honeywell, 3M, and GE are agreeing to alter facilities to produce face masks, hand sanitizers, and other shortages in hospital supplies (Smith, 2020). With the closing of manufacturing facilities, you have unemployment. Recent closures have contributed to an unprecedented unemployment rate in the United States that is "three times worse than the peak of the Great Recession" (Cox, 2020: para 9). Similar unemployment figures are being realized around the globe. These global dynamics are setting the stage for new emerging corporations for the post-COVID-19 age, producing innovative products for a different kind of customer. To survive in the future, pivoting product lines to meet current demands, even if these demands require producing a completely new product, will be the new norm expected of corporations moving forward.
- National security is at risk because of COVID-19. One such example comes from the inability of the *USS Roosevelt* to continue operating as it became grounded in Guam as a result of illness among its personnel. After identifying three members with the virus, standard procedural actions called for removing these three people to an isolated healthcare facility for treatment. Unfortunately, after a brief time, two days later, the aircraft carrier was forced to shut down indefinitely, placing our national security at risk. Although the U.S. Navy, and other military divisions, are known for being capable of responding quickly in times of emergency, the actions taken followed protocol and best practices, placing personnel in danger as a result of the COVID-19 outbreak. The protocols and best practices followed were not suitable for complex issues or problems; they were designed for reacting to known problems. For complexity, new techniques must be developed and practiced.

- The healthcare industry already had been growing with high demands for qualified personnel to meet this growth. With the current pandemic, healthcare workers have placed themselves at risk, with many paying the ultimate price. China estimated that more than 3,300 healthcare providers were infected, with about 22 deaths. Similarly, Italy experienced an infection rate of approximately 20% among healthcare providers, with a few deaths (Editorial, 2020b). Because of the COVID-19 pandemic, some are claiming that the United States will soon "run out of health care workers who are essential in fighting the sprawling pandemic" (Semotiuk, 2020). Similar shortages are expected in other regions, especially Africa and Latin America, where the pandemic is just beginning to surface.

The SARS-CoV-2 virus had been identified as being a natural virus and not manufactured. Researchers determined that this virus was "the results of natural selection and not the product of genetic engineering" (Scripps Research Institute, 2020: "Evidence for natural selection"). The COVID-19 virus naturally emerged in a way that was possible for the virus to change hosts and jump to humans. Similar events have occurred in recent history. For example, in 2003, the Severe Acute Respiratory Syndrome (SARS) epidemic surfaced in China, which was a virus that transferred after being exposed to civets. In 2012, the Middle East Respiratory Syndrome (MERS) emerged in Saudi Arabia, which had moved from camels (Scripps Research Institute, 2020). The agent transferring the COVID-19 virus is likely a bat, as this virus is similar to a bat coronavirus. Other potential sources could be from pangolins, armadillo-like mammals from Asia and Africa (Scripps Research Institute, 2020).

Response to the COVID-19 pandemic has resulted in countries implementing social distancing efforts; testing and isolating those infected; calling for lockdowns at local, state, and country levels; and rationing health services as a result of shortages in healthcare equipment, supplies, and providers. These protocols are in place to reduce the global death rate to only 1.9 million, an estimated savings of nearly 40 million lives (*Nature*, 2020). At the time of this writing, the total number of infected people approached 500,000, with estimates of between 23,000 (*Nature*, 2020) and 39,356 (Gale, 2020) deaths globally. The spread of COVID-19 is exponential: "It took 67 days for the 100,000 cases to be reported, but just 3 days to go from 400,000 to 500,000 cases" (*Nature*, 2020: 17:35). Several experimental test trials are in progress, but we have no vaccine to date. Even with a vaccine, it does not necessarily protect us from any potential new threat or variation that may emerge from COVID-19.

These types of viral threats will be more commonplace rather than historic anomalies. Although the actions taken to prevent the spread were critical to avoid COVID-19 from spreading to unimaginable heights, these efforts still were reactionary measures. Reactionary measures are behaviors to manage an event after it already has occurred. In this case, the social–physical distancing, calls for lockdowns, and isolation of those infected are reactionary measures. These are best practices played

out on a global scale. Unfortunately, the human race cannot afford to survive on "best practices." These are not effective strategies for protecting the human race; this could be the beginning of the end of our life cycle—the worst-case scenario.

Early signs had been ignored (e.g., SARS, MERS). This is a point that we make in The Flow System; we stress the importance of identifying and acting upon weak signals. Previous events should have raised warning signs that a pandemic was highly probable. This is evident in the following statement: "The damage wrought by SARS, Middle East respiratory syndrome, Ebola virus, Zika virus, the 2009 H1N1 influenza pandemic, and a widespread acceptance among scientists that a pandemic would one day occur" (Editorial, 2020a: 1011). Rather than countries and local communities stumbling to develop a game plan and course of action, programs already should have been made, agreed upon, and put into effect once the COVID-19 outbreak had reached the local community. For example, healthcare providers have to determine the best course of action for their personnel (e.g., doctors, nurses, staff, surgeons). This created a situation in which "most institutions do not have set policies yet, and providers at high risk levels of severe illness from COVID-19 continue to report to work" (Kofman and Hernandez-Romieu, 2020: para 8). Measures to identify, test, and develop a vaccine should have taken a priority, with any necessary resources being made available to do so. If the weak signals were acknowledged earlier on in the outbreak, the essential resources already would have been made available.

Countries and government officials should have been on the same page with the same global reaction around the world. Instead, we experienced delayed responses from various government leaders, ranging from suspended funding to support measures in the United States and other countries, to some countries ignoring the virus entirely. It wasn't too long ago, May 2018, that President Trump's administration nixed the U.S. pandemic preparedness office leaving them "flat-footed in confronting the virus" (Shesgreen, 2020: para 10). Other examples include President Obrador of Mexico (also known as AMLO), who was "dismissive and outright irresponsible" (Felbab-Brown, 2020: para 1), failing to adopt any measures to counter the spread of COVID-19. The Mexican government did not ban nonessential public events until March 24, 2020, which was counter to President Obrador's previous calls for socializing, hugging, and kissing people (Felbab-Brown, 2020). Local officials who recognized the threat were forced to counter President Obrador's directives and take measures locally to protect their communities. Other countries had similar political battles and debates on what course of action was necessary and how evasive these measures would need to be. These behaviors led to delayed responses by governments in which the citizens would be mostly affected:

> The initial slow response in countries such as the UK, the USA, and Sweden now looks increasingly poorly judged. As leaders scramble to acquire diagnostic tests, personal protective equipment, and ventilators for overwhelmed hospitals, there is a growing sense of anger. (Editorial, 2020a: 1011)

These debates also have centered on what impact these measures would have on the country's economy (e.g., gross domestic product, unemployment rate), all items irrelevant to the COVID-19 pandemic, and its eradication. In the end, these actions delayed much-needed safety measures to be implemented, resulting in the adoption of "best practices" being delayed, and making them just "practices" at best.

These points showcase the disconnect that exists between leaders (government officials) and those closest to the problem (scientists and healthcare workers). Decisions by those at the top are insular from the problem. For those dealing directly with the problem, they often must operate with a lack of resources, information, and support. These frequent examples highlight the importance of leadership; leadership must be distributed and not directional. Distributed leadership calls for those closest to the problem to be capable of making decisions and taking action to meet the demands of any threats they may encounter. Leadership is designed to support these actions by fostering enabling constraints rather than placing roadblocks in the form of inhibiting constraints, and preventing them from acting. The Flow System highlights distributed leadership as a hybrid leadership model that distributes decision-making capabilities to those closest to the problem or customer. Those at the executive levels provide support functions and strategic plans, but necessary decision making must be local.

The tools and practices used for managing or operating in complexity are not the same tools and methods required for complicated or clear problems. Best practices, a technique for clear and complicated issues, could have worked to help reduce the impact of the COVID-19 pandemic in a pre-COVID-19 era as a precautionary and preventive action. Implementing these practices in a post-COVID-19 era places these practices as reactionary and only chases the problem; these practices work for known but not complex issues. The COVID-19 outbreak created a complex environment on a global scale as soon as it became a pandemic. We are just beginning to see the ill effects of using tools and techniques designed for complicated problems in a complex environment. You cannot utilize current "best practices" to resolve complex issues; it requires complexity thinking and new techniques. For example, although current events to repurpose manufacturing facilities to make up shortages in much-needed healthcare supplies are necessary, these efforts came much too late. Too late for many. Exaptation, or repurposing existing facilities or products for a new innovative purpose, is one of the known techniques for surviving in complex environments. These efforts should have been triggered immediately with the detection of the appropriate weak signal. To move in a rapid manner is essential to halt the spread of an epidemic, preventing it from reaching the level of a global pandemic. This quick response would require community members, healthcare workers, local government officials, logistics and supply chain experts, and researchers to act together as diverse and capable teams in a multiteam system. This response

would require resources and support from leadership at the global, national, and local levels, providing them with the capabilities and resources for the multiteam systems to act as they deem necessary to contain the spread of the virus.

These actions connect all of the components of the Triple Helix of Flow, integrating complexity thinking, distributed leadership, and team science into a cohesive unit. The Flow System, and this book, provide details for each of these three helixes, integrating them into a coherent system. You cannot address significant complex problems with leadership alone; it requires teams and multiteam systems. This integration is what constitutes flow, the seamless transition from ideation to delivery. The Flow System introduces a new system of understanding how to manage in disrupted, complex, and ambiguous environments. The methods, tools, and techniques are provided in this book but are also available in a free online guide book at https://flowguides.org/index.php. Currently, this guide has 10 different translations available, with more expected. Although this book, *The Flow System: The Evolution of Agile and Lean Thinking for the Age of Complexity*, presents the same methods, techniques, and tools, it also provides the research behind The Flow System and explains each of the three helixes as well as how their interconnectivity creates the Triple Helix of Flow.

These are just a few examples that demonstrate the impact caused by the COVID-19 outbreak that emerged into the pandemic in which we are now living. These are complex and ambiguous times, indeed. Although we understand that The Flow System is not the only source for necessary tools and techniques, The Flow System is an excellent starting point for many.

We do not yet know what this new complex environment will look like as we transition into a post-COVID-19 era, but we do know that we need a new kind of thinking for the post-COVID-19 age. We are living through the effects of this pandemic and must realize two essential facts. First, the global landscape will be different in the post-COVID-19 time. The world, as we know it, no longer exists, and what it looks like in the future will be up to us. Second, it is critical for nations, countries, states, communities, and organizations to learn, adapt, and begin to implement new methods, techniques, and tools that are designed for complexity. This transition can begin by utilizing the techniques provided in The Flow System. We are hopeful that The Flow System; the integration of the Triple Helix of Flow; and the methods, techniques, and tools provided in The Flow System will aid everyone during this new journey. We trust this will give us, the human race, the capabilities to prevent a pandemic from occurring a second time.

Our appreciation and gratitude go to the healthcare communities, scientists, and researchers working tirelessly to develop a vaccine for COVID-19. *Thank you!*

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CHAPTER 3

The Flow System

The Flow System

The concept of flow involves one's experience of being totally engaged, the sense of "joy, creativity, the process of total involvement with life" (Csikszentmihalyi, 1990: xi). Flow, from a psychological perspective, relates to achieving happiness by having control of one's life (Csikszentmihalyi, 1990). Within the context of the theory of optimal experience (or happiness), flow has been described as follows: "The state in which people are so involved in an activity that nothing else seems to matter; the experience itself is so enjoyable that people will do it even at great cost, for the sheer sake of doing it" (Csikszentmihalyi, 1990: 4).

From a personal viewpoint, achieving happiness effortlessly would be the best explanation of flow. One example of this would be when an artist finally reaches the stage at which they feel their product is done. Many artists struggle with finishing a product, constantly wanting to tweak something or start fresh just because they don't, or didn't feel, that the product achieved what was anticipated. Once these struggles escape the artist, and the artist feels that the piece of work is finished, a sense of relief is felt along with the joy of contributing a new piece of work.

This same feeling of joy and happiness has been found in studies looking at dance and listening to music (Bernardi et al., 2018). These studies have defined flow as "a strong rewarding experience of deep absorption and energized, focused attention" (Bernardi et al., 2018: 416). Other experiments include spoken-word artists performing in conjunction with dancers in an improvisational performance. The spoke work artist would speak while the dancer reacts to the spoken words. This improvisational performance known as *Flow!* has taken root in the United Kingdom in which two art forms, spoken word artists and dancers, come together as an *integrated whole* to achieve a type of *consciousness awareness* (Connell and Newland, 2017). In this context, flow is best described as "a narrative

of in-the-moment decision-making of judgements, directions and predilections that inform the dancer's movements" (Connell and Newland, 2017: 264).

Flow is characterized as being associated with the "upswing, upwelling of life" (Smith and Lloyd, 2019: 3), as a product of "our actions and interactions with others" (Smith and Lloyd, 2019: 3). This description extends the activity of flow from being just an individual construct to a social construct. This upswing and upwelling of life occurs from the interactions with others, when structure and practice become unnoticed and all that is conscious is the act of doing.

This move to flow being a social construct implants knowledge gained from fields, such as anthropology, ecology, physics,[1] psychology, and team science, to name but a few. Flow is a result, in part, of collective motion in which individuals, or agents, learn to react to their environment to obtain their goals. Agents achieving flow through collective motion is identified in the following: "Entities that interact with their environment via explicitly modeled perceptions and actions, endowed with an internal mechanism for deciding how to respond, and capable of adapting those responses based on an individual history of interactions and feedback" (Ried et al., 2019: 2).

In The Flow System (TFS), providing customer value cannot be achieved without first interconnecting the concepts of complexity thinking, distributed leadership, and team science as an integrated organizational structure. TFS is contextual in that it is primarily conceptualized for complex, ambiguous, rapidly changing, disruptive environments rather than for dealing with the status quo. The concept of flow is an evolving process, as the components of complexity thinking, distributed leadership, and team science become more interconnected over time, flow becomes even more seamless, natural, and unnoticed. Flow as an evolving concept comes from constructal law, which states that everything that moves is a flow system and the system's configuration must evolve in such a way that provides easier access to the currents of flow through it (Kosner, 2012). TFS is one such design for organizations to evolve while navigating, successfully, disruptive and complex environments. The following sections provides a brief description of TFS, while the remainder of this book provides details of each component in the system.

The Triple Helix of Flow

TFS is composed of three essential concepts or schools of thought: complexity thinking, distributed leadership, and team science. Each of these components

1 From the field of physics, constructal law states: "For a finite-size system to persist in time (to live), it must evolve in such a way that it provides easier access to the imposed (global) currents that flow through it" (Reis, 2006: 269). Constructal law highlights that a system to does not develop on its own: "system shape and internal flow architecture do not develop by chance, but result from the permanent struggle for better performance and therefore must evolve in time" (Reis, 2006: 269).

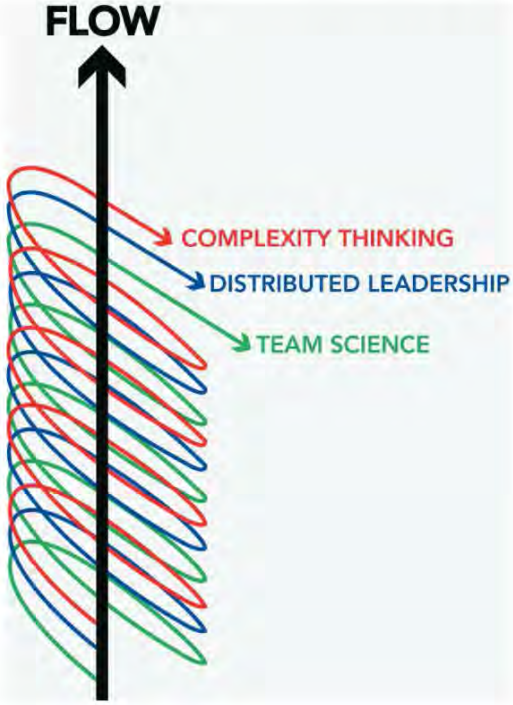

FIGURE 3.1. The Triple Helix of Flow

must be interconnected, synchronized, and embedded in an organizational structure before being able to achieve flow in delivering value to the customer in complex and disrupted environments. This integration of these three concepts is what we termed the Triple Helix of Flow and is shown in Figure 3.1.

The concept of a triple helix represents the spaces in which the interactions between and among agents emerge to become more adaptive and agile. This triple helix represents the interconnected links between complexity thinking (agility), distributed leadership, and team science principles. This new agile triple helix can be described as being similar to other conceptual models. For example, when identifying the processes of innovation, a triple helix of innovation was represented by Leydesdorff and Etzkowitz (1998). Their representation identified the triple helix of innovation that included the interactions among independent institutions (industry, government, and academia). The Triple Helix of Flow is similar with the exception of the integrating agents; here, we are looking at the patterns that emerge between and among agents through the frameworks of complexity thinking (agility), distributed leadership, and team science principles. The Triple Helix of Flow identifies the nonlinear[2] interactions that emerge into new patterns, networks, and knowledge that advances innovation theory

2 Nonlinearity occurs when an input does not always produce a predetermined outcome.

and practice (Triple Helix Research Group, 2019). The emergence[3] that occurs from these nonlinear interactions from the concepts of complexity thinking, distributed leadership, and team science results in an organization's capability to adapt to external forces while providing value to the customer.

A System of Understanding

TFS is presented as a system of understanding. We define TFS much in the same manner that Deming defined a system for his *System of Profound Knowledge* (Deming, 1994). Deming's system of profound knowledge involved managerial transformation through an understanding of four components: appreciation for a system, knowledge about variation, theory of knowledge, and psychology (Deming, 1994). Deming stated that managers were not required to be an expert in any one of these components, all that was required for transformation to occur is for managers to have an understanding in which they can apply the components (Deming, 1994). TFS is such a system of understanding in that no one employee, manager, or executive is expected to be an expert in all three of the components (complexity thinking, distributed leadership, team science), nor are they expected to be a master in any one of the components. What is being proposed, however, is that employees, managers, and executives have a level of understanding of each of the three components so that they can be put into practice. The benefits will be an organization that is capable of adapting to environmental variation[4] to meet the demands of the customer in today's complex environment.

TFS also can be considered an informal theory. Formal theories are those that have been tested in different contextual settings and have been accepted by a discipline as an explanation or a prediction of a phenomenon of interest to that discipline. An informal theory is a new theory that has not been tested, or has not been fully tested, preventing the theory from being adopted by any single discipline. The theoretical life cycle, or the scientific process, however, involves the introduction of alternative theories that, at times, replace formal theories for a discipline. TFS identifies the constructs of the system and within the body of this book, the interconnections between each of these three constructs will be presented. This identifies how each of the three constructs must work together to achieve *flow*. TFS could be identified as a theoretical model per the following definition of a theory: "A conceptual framework that identifies the connections, or lack of connections, between concepts/constructs to describe a phenomenon that furthers the academic knowledge base and supports researchers and practitioners in the field in which the phenomenon takes place" (Turner et al., 2018: 38).

3 Emergence occurs when new outcomes not previously expected occur.

4 Environmental variation refers to the frequency in which environmental conditions change (e.g., globalization, global warming).

Not a Framework or a Taxonomy

Although presented as a system of understanding and a theory, TFS is not to be mistaken for a framework or taxonomy.

A framework is a presentation of systems or concepts that are expected to be present across all, or many, domains (Snowden, 2012). It is a representation of a structure or a system that consists of categories that account for a phenomenon; frameworks describe phenomenon by categorizing items or events, but they do not provide explanations for phenomenon (Nilsen, 2015). TFS is not a framework and does not provide any type of categorization.

The purpose of a taxonomy, typically represented as a 2 x 2 matrix, is to "classify units of study by creating superordinate categories that are similar on a number of different underlying dimensions" (Hollenbeck et al., 2012: 83). Taxonomy is another tool used to categorize items or events related to a specific phenomenon. Again, TFS is not taxonomy.

A Brief Description of The Flow System

As a system of understanding, TFS highlights the essential components that lead to *flow*. Flow is constantly moving steadily and freely, like a river, with temporary boundaries and constraints. Also, like a river, the force over time will change the boundaries and restraints, causing the river to flow in the same manner but along a different path. The river will continue to flow just the same. When dealing with human social systems (e.g., team, organization, government), the boundaries and constraints are human-derived (human-made and self-constructed). A social system can either be derailed by these self-derived boundaries and constraints, or the social system can transform in such a manner that the flow changes the boundaries and restraints allowing the social system to forge ahead. TFS is a system that provides the necessary components for a social system to *flow* in times of uncertainty, complexity, and ambiguity to provide the ultimate objective for any organization, to provide value to the customer.

The components of TFS (complexity thinking, distributed leadership, team science) must be interconnected into one fluid river rather than separate smaller streams. The tools and techniques listed under each of these three components in Figure 2.1 include only a few tools and techniques that have been identified to address complexity. There are more tools and techniques than those listed, and there are more being developed as time moves on. Our intention was not to list all of the tools and techniques in one diagram; we listed only some of the main tools and techniques that we have experienced to date. Other tools and techniques will be identified and tested over time, and this list will more than likely be updated over time. This work to identify additional tools and technique is part of a larger project within our research team. Updates to the list of tools and techniques will be provided on our webpage (www.theflowsystem.com) along

Recommended Readings

The Flow System Reading Materials include:

1) The Flow System: The Evolution of Agile and Lean Thinking in an Age of Complexity;
2) The Flow System Guide;
3) The Flow System: Key Principles and Attributes.

The Flow System: The Evolution of Agile and Lean Thinking in an Age of Complexity

Amazon Hardback Edition: https://amzn.com/1680400584/
Amazon Kindle Edition: https://amzn.com/B08NXPGMSC/

The Flow System Guide Available online (free)

https://flowguides.org/index.php

Amazon book (print-to-order)
https://amzn.com/B085KN39FP

Amazon Kindle Format
https://amzn.com/B085PQFXFN/

The Flow System: Key Principles and Attributes

Amazon book (print-to-order)
https://amzn.com/B085DQB92N/

Amazon Kindle Format
https://amzn.com/B085DHFNMT/

Praise for *The Flow System!*

"The only thing that is certain about highly complex situations is that all interventions will produce unintended consequences both good and bad. Our ability to disrupt the bad and exploit the good is a measure of our resilience at all levels. The Flow System's Triple Helix provides many of the tools and ways of thinking we will need to do that."

— DAVE SNOWDEN

Creator of the Cynefin Framework; Chief Scientific Officer of Cognitive Edge; Director of the Cynefin Centre

"The Flow System shows how to generate and nurture self-organizing teams that mobilize the full talents of those doing the work to cope with dizzying change and complexity, while also drawing on the contributions of those for whom the work is being done — the customers."

— STEPHEN DENNING

Forbes Senior Contributor on Leadership Strategy; Author of *The Age of Agile*

"Organizations that pull off this Triple Helix trick of thinking about the complexity of their systems and the environment in which they're operating, distributing leadership to engage the collective intelligence and creativity of the organization, and building teams of teams so the whole is greater than the sum of the parts have a good chance of keeping up and staying ahead."

— DR. STEVE J SPEAR

MIT Sloan School Sr. Lecturer; Author of *The High Velocity Edge*

"The authors of The Flow System thankfully make no claims at offering a roadmap. Instead, they suggest a set of concepts and practices to serve as invaluable aids in navigating the uncharted waters ahead."

— JOHN SHOOK

Chairman Lean Global Network; Senior Advisor Lean Enterprise Institute

"I strongly recommend that you create your own way.
The Flow System builds on TPS in helping you do that."

— RITSUO SHINGO

President Institute of Management Improvement; Former President Toyota China

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