



Chaos as Creativity

Catherine E. Wilkins

Western University

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“When you arise in the morning, think of what precious privilege it is to be alive – to breathe, to think, to enjoy, to love.” Marcus Aurelius

About the Author

Catherine Wilkins is inspired by the collegial culture of Western Libraries and Western University. She provided leadership for The D.B. Weldon Library 2006-2018 and is now Librarian Emeritus. In her role at Western she worked collaboratively with colleagues and students on a variety of strategic library initiatives, was elected to Senate and actively served on numerous University Committees. Catherine holds a BMus (Western), MLS (Western), MEd (Toronto), Ed D (Toronto). Catherine's professional experience and scholarly achievements support her view that the academic library, as it has throughout history, continues to play a key role in supporting lifelong learning, teaching and research in the academy. It is important to balance the value of the academic library as a place of inspiration, scholarship and social interaction with the globally accessible digital library. Libraries hold culture—past, present and future that is paramount for intellectual freedom supporting scholarship and research and is fundamental to fostering democratic values. Catherine resides in London, Ontario actively enjoying the arts and music cultural milieu.

Acknowledgements

I am thankful to Western University for granting me Academic Leave so that I can finally present the Chaos Strategics Planning Process diagram that Kenneth G. Wilkins, BSc, Mathematics (Western), MA Sc, Management Science (Waterloo), my late husband and I worked on over time evolving originally from my Doctoral Dissertation. I dedicate this work to his memory.

I constructed and lead a comprehensive review committee for the manuscript. The review process consisted of multiple meetings and ongoing discussion, from draft review through to final review and completion. Committee members from Western included the following: Robin Keirstead MA, MAS, University Archivist, Western Libraries who thoughtfully reminded me about the importance of setting context for the reader. Joel Faflak PhD, Professor, Department of English who suggested I write in first person narrative to describe my journey through the Chaos Strategics Planning Process. Donna Pennee PhD, Professor, English, who encouraged me to use my voice and who provided a broad interdisciplinary perspective. Shirley Harrison MEd, an external colleague from the Peel District School Board who provided a contemporary perspective beyond the University.

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On a personal note I would like to acknowledge Susan Haley MSc, my sister, she encouraged me to be methodical, task-oriented and stay focussed. As a result, I developed thorough outlines and once I started to write the text and ideas began to flow.

I am also grateful for my many friends and colleagues who have joined me providing encouragement and laughter on this writing journey.

Preface

I am thankful to have been granted academic research leave by Western University. To prepare to write I took a course on mindfulness practice at Harvard University and am continuing with my mindful practice on a daily basis. I truly value and enjoy my solitude as it enables me to be reflective and gain energy, and may even share insight. That is for you the reader to determine. This writing project brings together 3 important facets of my professional-and-personal life: my education as a musician; my education as a librarian; and my life-long partnership and conversations with Kenneth G. Wilkins, with whom this manuscript first came into view.

Why am I writing this now?

I am finally ready to write this book having taken time to reflect over my career coupled with my personal reflection following the passing of Kenneth G. Wilkins, my husband and am determined that his thoughtful, creative, and insightful work, on the Chaos Strategic Planning Process which provides an overview to the Chaos Strategic Planning Process be presented for review, discussion and application (represented in the original diagram in Appendix A). This writing and Kenneth's original diagram, will be preserved into perpetuity in open access on Scholarship@Western, the institutional repository of Western University. For this I am truly thankful. It is my belief that this will honor Kenneth's thinking, and his memory. He was a proud graduate of Western University.

Purposeful Voicing

I am writing in first person narrative so that this work and the ideas are active, personal, thoughtful, reflective and authentic. To prepare for my writing journey, I read numerous

volumes to get my head into first person narrative. The writing of numerous authors is most inspiring – Ernest Hemingway, F. Scott Fitzgerald, Philip Glass, Neil Postman to name a few.

My Quest, My Voice, My Music

I am sharing my quest, my story mapped out in a narrative timeline outlining the sequence of events and connections of how the Chaos Strategies Planning Process evolved from my dissertation in 1995, coming full circle to 2018.

Following completion of my dissertation, *The Changing Library Environment* I went through a period of reflective thinking about whether the process and the resulting document was of value to other researchers. Now in 2018, looking back, the dissertation was valuable in terms of both content and process. The research methodology followed the Delphi method, which is used for future oriented study. This enabled and informed my thinking about mapping to future directions. One of the key outcomes of the dissertation was a conceptual summary, a framework with a diagram (Illustration: figure 4). The framework provided a theoretical structure to synthesize symmetrically and thereby capture the perspective of the past, present and future. The use of a diagram helped to focus on the theoretical structure and maintain symmetry for each subset frame of reference. The use of the symmetrical structure for analysis made it possible to identify the transformation factors in order to be able to develop their potential future relevance that influenced the change. Once the transformational factors between the past and present were developed, it was possible to postulate or project the factors affecting the transformation between the present and the future. Succinctly, applying the modeling process enables projection of a probable future. The concept of applying the framing construct to project a probable future is key. This can be broadened from libraries to many organizations.

The future is always my greatest driving interest! Music is my compass and pathway for thinking, but my thinking about chaos as creativity came after the dissertation, and was a spinoff from reading about chaos theory in science and mathematics. I was looking for something greater, more at 30,000 feet and I continue to be interested in the future of libraries and education at 30,000!

My quest for exploring with three decades of ongoing reflection

My exploration of the future of libraries and education began in the early 1990's and I am sharing three decades of ongoing reflection and learning as these decades are how my story unfolds to now!

Crafting the Dissertation

My dissertation resulted in the development of the Frame of Reference for the Changing Library Environment. The Framework was based on key elements within the library environment understood through the lenses of past, present and future timeframes and identification of factors that cause change. The Framework was symmetrical to synthesize the data for the past and present and create a foundation for projection into the future library environment and role of the librarian. The change or transformation factors, allow for both monitoring and a projection capability. It is important to note that the frame of reference does not predict the future however, following its principles it suggests a likely or probable future framework to enable the design of future libraries and training programs for professionals and users. The process of following the

design principles to project a likely or probable future framework is the part of the process that is most meaningful for me and I hope for my readers.

Sharing the Dissertation

It was now time to talk about my dissertation. This was a daunting task as I began to talk about it and the more I talked the more I flowed. I considered these talks as performances and for me—with my Music background--this is “flow”. Once I gave several talks--presentations to professional library and research associations across North America-- I began to consider-- broadening the Frame of Reference to make it applicable to a variety of organizational settings. I realized this process would take time and require more investigation and learning.

Testing my quest

Conducting a Feasibility study with Public and School Libraries (1996) was a fortuitous example of the application of the framework model for assessing the feasibility of collaboration between public and school libraries. Following completion of the Study, I was invited to present my findings to the Canadian Library Association. My quest to test my quest was evolving and I needed to continue to explore the literature further.

Exploring new ideas projecting the future

The 2000's provided time for more exploration and reading the literature about organizational change, strategic planning, organizational behaviour, and chaos theory – in science and mathematics. Chaos theory was an intriguing concept and platform for ideas. “What if” became integral to my thinking and fuelled my quest!

During the 2000's I was leading and learning in my voice and gave numerous talks, that is, performances—using my Music background-- in my voice, to a variety of audiences in libraries, business, research, and education.

My reading interests included organizational change and organizational behaviour from the perspective of the social sciences, and I was seeking literature that made sense within the context of libraries and educational institutions. At the same time, I was reading about chaos theory specifically the writing of James Gleick's, who cites the research on chaos theory of Edward Lorenz and others. Gleick and others write about chaos in relation to science and mathematics. My early understanding of chaos theory then was conceptual relative to science and mathematics; subsequently, I began to explore the literature about chaos in other disciplines, returning to Tom Peter's *Thriving on Chaos* from 1987 and reading broadly from there.

Music continued to be my compass, central to my thinking, with reflective practice and listening serving as a pathway forward.

Thinking from 30,000' my quest in the clouds

Around 2001 I had an idea to explore chaos theory and discuss the idea of looking at chaos terminology in, and applicability across, disciplines and timeframes. My personal assignment at that time was to begin to collect quotations and articles of interest related to chaos. I considered that chaos could be a possible source of ideas like “what if?”, and open new thinking related to change and creativity, within the context of libraries and education.

Mapping the Chaos Strategics framework

In the early 2000's Kenneth and I continued to discuss how the original Frame of reference could be abstractly applied to a variety of organizational situations and settings. He re-crafted and evolved the original framework into the Chaos Strategics Planning Process seen in Appendix A, Figure 3. This diagram continued to evolve, and he integrated his ideas from mathematics for clarity. We discussed this at length and continuously over many years. We wanted the diagram to present an overview of the planning process in such a way that it could be understood by readers at a glance. This meant that the diagram should be able to stand on its own and be understood. Of course, we all see things differently so there were several versions of this Figure and I have included the final version in Appendix A. Figure 3.

Going to Harvard

Completing the Harvard Academic Libraries Leadership Course influenced my thinking and was a stimulating learning process. Two concepts stood out to me: “going to the balcony” and “kaleidoscopic thinking”. “Going to the balcony” is the metaphor for taking stepping out of the room, going to the side-bar getting a view of the big picture of organizational context. Joan Gallos, (Harvard, 2007) suggests that we all have a “blind spot” and we need to identify it and be aware that we may miss things in our analysis of problems and situations. Her metaphor is a helpful reminder and I practice it on a daily basis. At graduation, in his closing remarks, Joseph Zolner (Harvard, 2007) passed around a kaleidoscope, his symbol for the leadership process. He stated that all leaders need to think “kaleidoscopically”, which means thinking on many planes simultaneously. I have come to think that “going to the balcony” enables reflection and may

open pathways to creative thinking. The kaleidoscope concept captures the multiple modes of leadership and change. When I make presentations, I send my kaleidoscope around and share this perspective.

Writing from 30,000' literally

During 2009-10 I was travelling around North America with a group of colleagues involved in a library leadership fellowship program. During this period of travel, we were learning about various research library settings. I spent much of my flying time drafting an article outlining the Chaos Strategies Planning Process. This is the foundation for Chapter 2 of this manuscript.

The music continues with the passing of Kenneth

With the 2013 passing of KGW, my husband, I came into a period of simultaneous reflection and motivation. I was deeply committed to completing the manuscript and motivated to write and publish the Chaos Strategies overview framework to share in an open access platform. I was exploring and learning, and music continued to be my pathway for exploring chaos as creativity.

Exploring chaos, and creativity through music

I dove back into the literature and developed a proposal for Academic Leave and also focussed on playing the piano and listening to music intensely. The scope of my literature search became an exploration of chaos theory and chaos not just across disciplines but also over time periods. As I dove into the literature to explore chaos across disciplines, and over time it became clear to me that chaos is an integral aspect of change opening us to creativity. In my view we actually benefit from and need chaos to open our minds, and thinking to change, and creativity in order to

go forward and create our future, the future we want and deserve. As a result the title for this writing is: Chaos as Creativity.

Today is a new day – Chaos as Creativity

My Academic Leave commenced in June 2017, and I am sharing my story through this wonderful opportunity for new learning, reading, thinking and writing with music as a compass and now an underlying analogous theme. I am purposefully speaking in my voice as a librarian, a generalist and musician. Writing, performing and presenting as forms of dissemination, are through my voice. This creative work is truly energizing! I hope you will be energized as you read and consider ways for exploring new ideas using chaos as creativity in order to create the future you want!

Chapter One

Introduction

During current times, the world is facing major global threats: climate change environmental crises, expanding economic crisis, poverty, violence, and inequality. The global society needs the humanities to find fair and meaningful solutions to its problems, and the humanities must collaborate with a variety of disciplines, from social sciences to the technological fields, to meet these challenges. Respecting the distinctiveness and complexities of these disciplines, each of them contributing in its own right, the humanities must continue to analyze and propose theories and methods, to combat ignorance, intolerance and injustice, and to act upon the world. (Pettersen and Bjorsnos, 2015, p.5)

As I begin to write today I am reminded of Pettersen and Bjorsnos' reflections on the work of Simone de Beauvoir presented above. Several of the chapters in *Simone de Beauvoir—A Humanist Thinker* examine her interdisciplinary approach and argue that she advances the humanistic sciences. Like Pettersen & Bjorsnos I believe the ideas of Simone de Beauvoir are timely, relevant and accurate for our global world today.

Humanistic research and study teach us not to forget experiences and knowledge of the past, but to reflect upon them and use our collective memory to better address the needs of today's society. For example, to enable citizens to actively participate in the continuous effort to build and defend democracy, key humanistic methods such as critical analysis and interpretation are required. In contributing to the education of today's and tomorrow's citizens, the humanities need to interact with society. This is another example of where Beauvoir's work and life offer an excellent model. Her thinking—rooted in humanistic traditions at the same time inspired by the ethical and political questions of her time—aims at concrete action and engagement.

(Pettersen and Bjorsnos, 2015, p.6)

The humanistic traditions of Simone de Beauvoir speak to concrete action and engagement. Action and engagement are purposeful, thoughtful and proactive – and are imperative. Now, in 2018 it is time for us to step forward to act proactively, collectively and collaboratively to create an inclusive, collaborative, proactive sustainable society and global world for the betterment of all.

Today is a new day – the first day of my academic research sabbatical, and this is my opportunity to tell the story of *Chaos as Creativity*. This writing will be about chaos and about planning. It will be a narrative journey where we will connect two concepts unlikely partners—chaos and planning-- and use chaos, though non-linear, as a pathway to explore how chaos can open our thinking, inspire creativity and become a critical element in planning for today and generations to come.

Over the course of my career as a librarian and a generalist I have developed a perspective for seeing the big picture from the clouds, seeking knowledge, as ways of making meaning - understanding to illustrate and to explore. I share the sentiment of Michael Harris in his most recent writing *Solitude A Singular Life in a Crowded World*, where he refers to the solitary aspect of writing a book. In his words, “as I began writing this book I was dreading the time I’d be spending alone”. He continues and acknowledges that he reclaimed his solitude over time as “moments of solitude started showing up everywhere” (Harris, 2017, p. 41). By that point he was reaping the benefits of solitude. Understanding “solitude” as also “adventure” is just one example of how “chaos” and “planning” function together for me. For me this writing process is an adventure that is daunting and exciting at the same time. I enjoy reclaiming my “moments of solitude” and the opportunity to write, wonder and think and write again all the while continuing to wonder!

*Planning
for the
future*

Now, let's begin.

I dipt into the future far as human eye could see;
Saw the Vision of the world and all the wonder that would be.
Alfred Tennyson (1835)

The words of Alfred Tennyson, from *Locksley Hall (1835)*, seem fitting in 2018, as he reminds us of the importance of vision and holding onto wonder as we look into the future. As you read this text I invite you to use the ideas and thoughts presented to inspire thinking, explore possibilities, push boundaries, raise questions and provoke the same in others. We live in a time where we are immersed in a world of ubiquitous connectivity through technology and participatory culture that holds tremendous potential. Through it, we can challenge the status quo – and we all have a voice. It is time to create, think, reflect, speak, be heard and act to create the future we want, our future.

My writing is not so much about solutions or answers but a presentation of ideas with interconnections and parallels related to understanding the management of change as an abstract principle. Through the process of exploration we will observe progress toward change along with transformation to reveal interconnections/ inter-relationships and parallels between ideas that encourage thinking, and conversation for enabling a future forward perspective. Ultimately, I hope this exploration will help others to engage and come up with solutions or answers to their own questions or challenges.

Setting the context

In my role as a librarian my voice is that of a generalist. Over the course of my career I have worked in a variety of library environments, which I call the continuum of libraries and am sharing my broad perspective. “Libraries as an institution are one of the key structures that hold and deliver information to our community.” (Wilkins, 1995, p.1). Libraries hold culture—past, present and future.

In the Opening Statement delivered at my Dissertation defense in 1995 I said this:

our society is experiencing tremendous change (economic, social and technological). It is evolving from a post-industrial to an information-based economy (global influences – globalization of our society – particularly as it relates to doing business and the way society functions). Societal changes are impacting libraries and the role of librarians. As a library professional I see first-hand how increasing demands require:

- 1) Information be delivered in multimedia form, and it needs to be timely, relevant, accurate and secure
- 2) Information needs to be managed and interpreted because of volume, while ensuring the accuracy and integrity
- 3) Standards and security are required because of the ease of manipulation of data and information through technology

We need to understand the foundation of the library environment and the role of the librarian to be able to use information effectively for strategic advantage—in business and education and to preserve information for historical purposes and we need a direction for the future library environment and the role of the librarian. We also need to understand the issues raised as a result of the changing library environment and the role of the librarian in order to create an effective library environment to meet needs and train professional to meet these new challenges. My dissertation focuses on these issues and presents a framework to address this problem (Figure 3).
(Wilkins, 1995)

With the benefit of the passage of 20 plus years, I am convinced these fundamental aspects of managing information are continue to be part of an expanded continuum we see today. We are immersed managing information in all aspects of our work as professionals. The rate and trajectory of change is increasing. The continuum of managing information is also top of mind for the working and academic lives of our diverse library user community. Our library users have become more directly involved and informed about these aspects of information management.

I do see in today's information knowledge based society that we are cognizant and mindful of the need to ensure that our information and knowledge is timely, relevant,

*Planning
for the
future*

accurate and secure. These four key concepts are constantly being challenged by those with competing interests. Some of our current information tools, such as social media that enable us to connect together as a community, have also made it easier for the interlopers to infiltrate and corrupt our information spaces--digital, ephemeral and print based. Challenges related to information and knowledge are evident in academia, research, the public milieu and across our diverse user community and society more broadly. These challenges need to be managed and we need to be informed about how best to mitigate these challenges going forward. As our information and knowledge based society continues to evolve, I continue to be curious about the role of libraries in our society and in education. In my view, in the era of “Fake News” now more than ever we need libraries and education to stand for and broaden our knowledge and scope in terms of managing access to credible, authoritative information. Consider libraries as the guardian of knowledge of the past, present and future as symbolized by the ancient roman God Janus (Wilkins, 1991). Libraries are the credible source for access to timely, relevant, accurate and secure information. Libraries have a critical role to preserve, hold, curate, disseminate and foster culture and knowledge-building through learning today and into the future. When you are in a library – be it a physical or digital library -you can be anywhere in the world and in any time frame. We have achieved the global library without walls and we need to be vigilant about holding the library as our cultural heart with a foundation based on supporting the full knowledge cycle.

*Libraries
hold
culture –
past,
present
and
future*

From 1995 dissertation to 2018 research

With a solid academic and practical foundation in libraries and in managing information and change it is time to step outside of my comfort zone, libraries and education, and leap into my new world to explore chaos as creativity. I am following my passion for exploring new ideas and interconnections as an abstract principle.

I am choosing my words thoughtfully and am mindful of using language to convey my ideas while striving to engage a broad readership to make this writing meaningful for today and for generations to come. Connecting chaos and creativity may seem unsettling, which is deliberately thought provoking, and proactive. The manuscript is suggestive of a series of parallels between domains and processes. The planning process, outlined in Chapter 2, is titled the Chaos Strategies Planning Process which is the title for the diagram in Figure 1. It follows the discussion of the Process in Chapter 2. The Planning Process is conceptually based on deterministic chaos theory drawing parallels from chaos theory. In discussion about the Process I refer to it using several terms such as process, model, construct, framework and overview and all of these are to be considered synonyms. In Chapter 3 we will learn about chaos theory broadly. My thinking and learning about chaos theory began while reading about the work of Edward Lorenz. In 1963, Lorenz published a technical paper titled “Deterministic non periodic flow”, and he discovered the butterfly effect which went unnoticed at that time. The term “the butterfly effect” was recognized by others later and made famous in 1972 when Lorenz presented a conference paper entitled: “Predictability: does the flap of a butterfly’s wings in Brazil set off a tornado in Texas?”. The butterfly represents a symbol of beauty connected to

*The
Butterfly
Effect*

creativity. We will discuss the work and findings of Lorenz and the “butterfly effect” further in Chapter 3.

Chaos as creativity

Let’s consider how chaos and chaos theory can be useful in planning as a pathway to foster creativity. I am most interested in thinking and writing about chaos as creativity. For the remainder of Chapter One I will highlight key ideas from the chaos literature that I see as an integral part of planning and necessary to foster creativity. The key ideas we will consider include; linearity and non-linearity and how they co-exist, cause and effect and influence and how they are related, the use of language to influence and to communicate how disruptors can be seen as positives; and finally, the recurrence of chaos, its history and continued relevance across disciplines. These ideas are interesting from several perspectives, not least of all because such they can be related and interconnected. I am using chaos theory to describe how planning is necessarily both ordered and disordered. In Chapter 2, I discuss how the Chaos Strategies Planning Process works using the overview illustration (Figure 1) as a visual to support the planning process. This discussion will inspire readers most interested in thinking about thinking and planning. In Chapter 3, I offer my ideas and discuss my exploration of chaos theory and chaos more broadly across disciplines and its recurrence from ancient times to now. From my perspective, chaos and planning are related in a cyclical process. I consider planning to be a holistic big picture activity that is dynamic and recurring. Systems are less bounded and less systematic than we might think, and thus changing any system will, of course, bring

and be disorderly. Put another way, the planning process is as important as the plan. Chaos is integral to planning, by fostering creativity and providing an opportunity for us to create an intriguing, non-linear pathway to our future. And in Chapter 4, I discuss Chaos theory as a metaphor, consider how we can create a probable future model and share my reflections on the survey of Chaos.

Chaos theory and planning

In the literature dating from the 1990's there are several authors -- Shipengrover, Murphy, Mossberg, and Richey -- from the discipline of education -- explore possible connections between chaos theory and planning. These authors all attempt to explain the unexplained aspects - that is the messiness of organizational planning and change relative to chaos and relate how these phenomena relate to our current organizational environments. In 1996 Judith Shipengrover published an article entitled: "If it Doesn't Embrace Chaos, Can it be Called a Strategic Plan?" (Shipengrover, 1996, p.1) and it remains relevant because the one constant of the world is chaos. The provocative title captured my attention. This article presents one of the most compelling cases for connecting chaos theory to strategic planning. Shipengrover suggests that we consider several dilemmas that are not fully explained by the strategic planning process. Specifically, she cites cases where, despite having strategic plans in place organizations may not really know where they are headed and the pathway forward is not clear because there will be disruptors that make it appear as if the system does not know where it is headed next. In some cases, organizations

will appear to move forward despite these disruptors, with some aspects of plans showing evidence of successful implementation and yet some plans will simply not happen or be implemented. Some organizations may improve in the short term, only to lose momentum in the long run. These are challenging situations for planners. Shipengrover points out that these ambiguous/uncertain differences are “universal characteristics of complex systems that scientists call chaotic.” (Shipengrover,1996, p.1). She continues with her analysis stating that: “the approach of strategic planning is not always equal to the challenge of explaining how we cope with such uncertainty and rapid change.” (Shipengrover, 1996, p.1)

In organizational cultures, policies, and structures are not likely to be changed merely through careful planning.

Specifying objectives may induce a temporary vision to bolster confidence. Planning may implicitly facilitate sharing the vision. Planning task forces and meetings may help create shared meaning. Reports may reduce ambiguity and symbolize that changes are on the right track.
(Shipengrover, 1996, p.1)

These steps sound all too familiar from my work in the school district, college and university library sector environments. They represent communicating a plan, sharing a plan, sharing its meaning and intended outcomes, and confirming those intentions

are being met. But: Shipengrover suggests that we are in a time of great change where our endeavours can be pre-empted at any time, with swings in economies, communities, governments, or technologies that cause, perpetual change. She refers to this state of perpetual change as “permanent white water” and suggests that how we become expert at handling planned and *unplanned* change is better explained by the new science of chaos. She continues to explain that

With new models and new rules, the emerging science of chaos and complexity challenges the way we think about planning. ... The new rules suggest that order emerges from the “messiness” of disorder through experimentation and trial and error. Unlike models of planned change, chaos teaches that there are no prefixed, definitely describable destinations and that we do not know what is going to matter until we are into the journey.

(Shipengrover, 1996, p.2)

Shipengrover elegantly describes the value of the journey, as opposed to the destination, because in a state of “permanent white water,” we cannot know the “outcomes” in advance.

Priscilla Murphy explores some key concepts of chaos theory and notes:

the very term chaos theory is somewhat misleading. She [Murphy] clarifies that although chaos theory incorporates elements of chance, chaos in her view is not random disorder. She suggests that chaos theory attempts to understand the behavior of systems that do not unfold in a linearly predictable conventional cause-and-effect manner over time.

(Murphy, 1996, p.96)

She suggests viewing the system as a whole, as this is how patterns and structures can be revealed or observed. She cautions that it would not have been possible to predict future direction solely based on past history, which is where chaos theory applies, particularly its concern with non-linearity. Murphy outlines the features and terminology of chaos theory, such as non-linearity, strange attractors and renewal. Using chaos theory as a model for managing change and seeing the big picture, she advocates to that things are not always as they appear. This is a familiar perspective and useful in planning when you are trying to dig deeper to understand the scope and depth of a problem or situation.

Mossberg discussed chaos in the context of an academic campus and she challenged the common perception of what we call “chaos whenever we deplore the state of things or simply want to give up” (Mossberg, 1993, p.49). She suggests we challenge our assumptions and recognize connections that are evident in large

dynamic systems as a way to open up our thinking. She calls chaos theory an oxymoron and, like Murphy, sees the value in looking at a system as a whole or from a broader higher perspective. She suggests we try to understand and learn about chaos so that we can manage change, and thus see and solve problems in our global world.

Thinking specifically about education and future instructional design, Richey outlines the influence of theory on instructional-design models of the future. She notes that change in thinking and instructional-design models is anticipated in areas such as chaos theory, constructivism, situated learning, cognitive-learning theory and general systems theory. Generally, instructional design models are explored from a linear perspective but Richey, notes there is growing interest in nonlinear models:

There is growing interest in chaos theory, where chaos theory posits the existence of order within apparently chaotic or seemingly random systems. Richey drawing from (You, 1993) asserts that nonlinear ISD models:

Assume a more holistic orientation, rather than one of mutual causality; are able to better accommodate those factors in a given situation which can interfere with the prescribed design processes; and reflect the dynamic and unpredictable aspects of the learning process.

(Richey, 1994, p.707)

Based upon emerging theoretical developments in the field, Richey anticipates the important influence that chaos theory will have upon the instructional design models of the twenty-first century.

Shipengrover, Murphy, Mossberg, and Richey share several intriguing ideas about how to approach and use chaos theory effectively when managing change and planning. Shipengrover uses “permanent white water” as an analogy for times when we are dealing with unplanned and continuous change. Murphy and Mossberg both allude to considering chaos from a broad holistic perspective. I concur with their ideas and see because we are in a time of constant— both planned and unplanned— change, adopting a broad holistic approach is valuable for problem solving and planning. The key points which they identified are central aspects of the Chaos Strategies Planning Process, as we shall see in Chapter Two.

Key ideas related to chaos as creativity

As we begin to think about key ideas related to chaos as creativity, let’s also consider the relationships between these ideas in terms of non-linearity and linearity, and cause and effect and influence. Another key idea is the use of language. It is how we tell the story and it helps us to make meaning or sense of and reflect on change. In fact, language is continuously evolving and it influences thinking and can bias readers positively or negatively. As well it recurs in cycles, that is, what goes around comes around. Now consider the relationships between these ideas. For example,

*Explore
new
ideas...
“what if”*

consider chaos and disruptors as positives instead of negatives as they are often characterized or juxtaposed.

Individually and collectively we have a central role to play in the process of planning and creating our future. This is part of our human chaos, but is not always how planning models and processes work, in that they often seek order in complex, dynamic, disorderly, messy organizational environments. We often find ourselves taking the linear approach of cause and effect, which provides a useful framework but does not tell us the whole picture. I am mindful that beyond “cause and effect” lies the role of “influence”, that is, the mess of intangibles related to change and exploration of new ideas. I call this approach the “perhaps there is another view”, “let’s be crazy”, which is to ask “what if?” or even loosely just to say “maybe”. For many at least, linearity is in fact valuable to help articulate and discern facts, from assumptions, but it helps to keep in mind several non-linear key concepts. From my perspective, then, cause and effect- the linear approach- is a useful beginning framework to explore ideas *while keeping in mind* several non-linear key concepts: “go to the balcony”, “apply kaleidoscopic thinking”, “watch out for your blind spot”. These are all reminders of what I learned at Harvard. I think that linearity and non-linearity can work in tandem in the most abstract sense as what chaos theory calls, “strange attractors”. The role of the effective planner is to recognize and acknowledge how linearity and non-linearity work together within a bounded range.

According to Shipengrover:

If we look at such a system long enough and with the perspective of time, it eventually settles down. There are areas the system is magnetically drawn to, pulling it into patterns. The most chaotic systems never go beyond certain boundaries; they stay contained within a shape. Scientists refer to the forces that pull chaotic systems into such patterns as strange attractors

(Shipengrover, 1996, p.3)

In time of change and chaos in my own life quest, I find myself constantly considering “what if”, and “what have I missed”! These are simple but probes valuable for exploring a non-linear perspective when planning. This is how I explore change and chaos and trust that you will find these probes useful for understanding and engaging in the exploration of chaos as a positive. I suggest that being in chaos is critical for perspective in planning and it is part of being human. Shipengrover suggests that one needs to be in the journey to see what is important. Her idea resonates with me as I see that *we have a role at the centre of planning* and chaos is a word for a paradox of a place and as human beings we are wired to continuously renew and look to the future. Looking to renew and get to the future is a cycle and is dynamic, both continuous and ever-present and this is the paradox of things. This is how things are and I recognize that planning is a process we use to get to the future.

This dynamic future oriented cycle is part of our human chaos. I acknowledge though that for some the pathway to the future may be linear and continuous.

In *Words without Music: a memoir* Philip Glass reflects on the work of John Cage who relates that music encompasses the interpretation of music—how we actively play the notes and score of a piece—are intertwined. (Glass, 2015, p.96) I find Glass' reflection insightful in relation to the Chaos Strategies Planning Process, in which the plan and the application of its process, provides a mapping tool similar to playing the musical score. Glass paraphrases John Cage who argues for the crucial role of the individual as interpreter of the music. Similarity in the Chaos Strategies Planning Process the reader, planner, teacher, librarian, writer, all “play” the Chaos Strategies Planning Process “score”. In so doing, all players are engaged in mapping probable future, and have a central role in influencing the process. So the question becomes: How do we embrace chaos to do something differently to be more effective in the future?

Language conveys meaning and everything is in a name, as the saying goes. But we also know language is continuously evolving. In the 1980s, Tom Peters' use of the term “innovation”, was about capturing and expressing ideas for managing change. Today we are seeing and hearing frequent use of the term “disruptors” to convey similar ideas and new directions for change. To some this terminology can have a negative connotation, as we do need to be mindful of language to convey ideas as intended. The terminology used in the Chaos Strategies Planning Process was chosen

purposefully and with intention. As part of our humanity we individually and collectively have a central role to play viewing things positively, not negatively in the process of planning and creating our future and this is part of our human chaos.

With the perspectives of Shipengrover, Murphy, Mossberg, Richey and Glass in mind, however, I suggest we step back and look at the whole picture. This big picture perspective is a fundamental concept that Kenneth and I discussed and built into the Chaos Strategics Planning Process. He was very much a “cause and effect” thinker owing to his study of mathematics. From his study of philosophy he also used phrase “project a probable future. “ We discussed the concept of projecting a probable future earlier in my doctoral work and this key concept continues to be evident in the application of the evolution of the Chaos Strategics Planning process. But I was interested in influence and saw this as a broader perspective and at the same time related to cause and effect. Influence is somewhat grey and ambiguous. The concept of projecting a probable future also expressed as a probable outcome, is where our ideas meshed. We will consider these ideas further in Chapter Two when we learn more about the Chaos Strategics Planning Process.

Voicing, curation and how this manuscript ties together

Voicing and curation are important concepts that resonate with me from my natural voice as a musician and librarian, which unifies performance and presentation as parallel activities. I am not talking about literary voice here. In my view there are three voices tying this work together, each of which plays a role in or is layered with,

the integration and curation of the whole work: the first voice is the Chaos Strategies Planning Process overview illustration (Figure 1); the second voice is the text that explains the process of planning at an abstract level; and the third voice is the narrative text that presents chaos and chaos theory across disciplines and over time frames, a narrative through which I connect chaos to creativity as integral to planning.

Let me give you an analogy. I think about voicing as similar to a musical composition with several integrated layers. For example, Beethoven's *Adagio Sostenuto*, the first movement from the Moonlight Sonata, Op 27, No2, for piano, (music that is likely familiar to many). The musical score is similar conceptually to the Chaos Strategies Planning Process illustration (Figure 1): the score the first layer and voice, the overview. The second voice is the melodic path woven through the score: this is the process of the music, how the music flows and where it leads, which describes how the process of planning is as important as the plan. Finally, the third voice is the repetitive pattern across the score and its performance, representing the flowing concept of moonlight floating over water through music: evoking how chaos, like change continuously swirls and evolves dynamically with some form of repetition.

Curating the Chaos Strategies Planning Process

The Chaos Strategies Planning Process construct is represented in the overview illustration (Figure 1). The illustration is an updated streamlined version for 2018,

based on the original overview diagram that KGW created (@2006-2012) (Figure 2) as an overall representation for the Chaos Strategics Planning Process. Together the updated illustration and the original diagram present a visual in the reader's mind's eye as you think and read through the planning process. For those interested in the original diagram it is included in the Appendix with explanatory notes to set the context and provide background into KGW's ideas. Keep in mind, both the illustration and the original diagram follow the principles of universal design--that is, that the diagram presents enough detail so that it stands alone for the reader to interpret meaning. Kenneth and I agreed that diagrams must stand alone, and we kept coming back to this fundamental design principle as versions, visuals and ideas evolved.

Everything is connected

Thinking about the interconnectedness of the three voices in the musical score and considering how this interconnectedness relates to the Chaos Strategics Planning Process, I draw your attention to the writing of Elana Mannes: “music teaches us everything is connected. Nothing is really disconnected.” (Mannes, 2011, p.212).

Interconnections, interdependence and parallels are by design and critically important in the Chaos Strategics Planning Process. In Chapter Two I will discuss how the Process works. To use the music analogy – melody, harmony and rhythm are interdependent in musical scores and performance; everything is connected.

Being provocative

To conclude this chapter, I am writing now to present the Chaos Strategics construct to inspire ideas and thinking for the next generation. We live in a time of tumultuous change and we truly must be--in fact we are responsible-- *for working together to create a greater world*. I present these ideas to inspire thinking, explore imagination, challenge the status quo, engage communication across disciplines, cultures, locations-- geo-political boundaries, and generations, all to address our humanity and set a path for going forward and creating community for the greater good in our global world.

Chapter Two

Making the connection—The Chaos Strategics Planning Process—is a conversation about change, chaos and creativity

The Chaos Strategics Planning Process is the start of a conversation about planning. The conversation begins when we acknowledge we are in a time of great tumultuous change and need to plan, craft and see our way forward. We need to have the end in mind; that is, what is our outcome and what is our endgame? The process, as in all processes, is valuable in part for the time it takes as this may enable us to pause, step back and reflect, converse, imagine, and create new as we move forward and plan and construct the future world we want. In planning it is valuable to adopt a holistic approach that encompasses kaleidoscopic thinking – where we can envisage in our mind’s eye a long view or high level perspective so that we can consider many possibilities and not overlook our blind spot. In the previous chapter we took a journey through the literature on the value of chaos theory and chaos as creativity. I believe considering chaos as creativity is a perspective that helps us to think about chaos as an abstract principle – up in the clouds at 30,000’, as the saying goes. The Chaos Strategics Planning Process will help organizations dealing with planned and unplanned changes and this is where the connection to chaos is useful. Change is cyclical, continuous and dynamic and to deal effectively with change one needs to adopt a problem-solving approach. The Process is intended to be helpful to inspire thinking, conversation, creativity, mindful planning and enable mapping our future plan. Now we will take a look at the overview of the Chaos Strategics Planning Process.

*Mapping
your
world*

First some background, Kenneth crafted the working title Chaos Strategics for the planning process. The planning process outlined is loosely tied to deterministic chaos theory from mathematics (Kenneth's discipline). The Oxford English Dictionary (OED) provides the etymology of chaos and chaos as related to math is defined as:

Unpredictable, apparently random behaviour exhibited by a dynamical system governed by deterministic laws, typically considered to consist of frequent instability, aperiodicity, and the occurrence of widely diverging outcomes corresponding to small change in the initial conditions of the system.

(OED)

As well, in the OED, the noun "strategics" has multiple origins and is partly Latin and partly Greek. The OED defines strategics as "the art, practice or science of military strategy" (OED).

We discussed strategies for managing change, and consider planning is a continuous, cyclical and dynamic process. Kenneth was mindful that we be provocative with the title for the planning process and break from the standard use of the term strategic planning. He chose to use "strategics" because it is a noun. I can say for certain these definitions for chaos and strategics, from the OED, resonated with Kenneth as he understood the mix of art, practice and science from his study of philosophy and

mathematics. He was also a proponent of the OED and always sought the etymology of the language he used. Kenneth's thinking and ideas are evident in the Chaos Strategics Planning Process, and the original diagram (Appendix A) is presented in the appendix with explanatory notes. The diagram evolved over time through our discussions stemming from his love of mathematics, philosophy, history and literature. He continuously challenged the status quo and was provocative.

Overview of the Chaos Strategics Planning Process

Introduction to our “InfoWorld”

Our world has been transformed into a globally information reliant society and a knowledge based economy that is characterized by major technical, economic, political, and social changes. While the transition to this new economy has been recognized for some time, the implications are only beginning to be recognized with regard to everyday life. In this new “InfoWorld” all sectors of our economy, both private and public, require greater access to information than ever before.

The education sector, specifically the higher education sector, has also been transformed as part of this new information and knowledge based economy. As a result, educators and researchers require access to timely and relevant information to support informed decision-making, solve educational problems and support research. There are many factors that are impacting education and the use of information. In Ontario the distinction between College and University is blurring, as Colleges were

given the opportunity to grant baccalaureate degrees in specialized areas of study in 2000. In the Ontario college sector programs are developed to provide skills based training and continuing education based on needs identified by local industry. College curriculum is developed locally and information skills, such as information literacy, are integrated into program curricula to enable students to effectively use information while gaining experience in solving practical, applied problems. The applied curricula model utilized by the college sector is also founded on the principles of problem-based learning. In the university sector the use of information is an integral part of the inquiry process, encompassing the broad spectrum of teaching, learning and research across the sector. Information literacy skills have been identified by the Ontario Council of Academic Vice-Presidents (OCAV) as critical learning outcomes for university completion. Throughout the curricula documents, information literacy is a prerequisite for success in all subjects, for preparation for work and further education, and for lifelong learning.

This changing information environment, particularly digitized information and virtual access to it, influences both organizational structure and how educators access and use information and in turn impacts how libraries in all education sectors deliver services to meet changing needs. In order to gain strategic advantage, learning to use information effectively is a critical skill for all learners in the continuum of education in primary, secondary, post-secondary and higher education.

Accordingly, academic libraries must be periodically restructured like the word “disruptors,” this word has negative connotations (about cutting positions) to deliver services to all of these stakeholders. For our education institutions a continuous cycle of managed change will be necessary to support changing needs for teaching, learning, and research. Kenneth and I refer this process as a cyclically modulated framework. The Chaos Strategies Planning Process uses the term “chaos sphere” when referring to the framework. Modulation refers to the process of adding intelligence to the base environment throughout its life cycle.

Our transformed information world, “InfoWorld”, has also greatly altered the role of the professional librarian and library staff roles. The conceptual metaphors that describe the role of the librarian in the changing environment are “an architect of information sources and services, and a client consultant.” (Wilkins, 1995, p. 48). The challenge for organizations and service delivery structures within them, such as libraries, is to successfully regenerate organizational frameworks that can respond to the many transition and transformation influencing factors affecting them and to create an environment which manages change easily and cost effectively for continued success.

Kenneth and I have combined our many years of experience and expertise to develop a process model that supports the strategic needs of libraries to adapt to and manage change. This model is dynamic, responsive and cyclical in its application. Since the environmental framework for libraries and the framework of influence are dynamic

not static, we refer to these frameworks as chaos spheres or chaos frameworks. The term “chaos” is used in its technical sense, borrowed from chaos theory, where the behavior within a sphere is reasonably well defined by initial conditions and the influences on that sphere are not random. In this sense it does not suggest complete disorder but does stress the presence of the variability of events which need to be managed to maintain order. The behavior of inertial and projected frameworks processed and developed in the model will be characterized as deterministic chaos frameworks. The Chaos Strategics Planning Process is a methodology for designing organizational frameworks or “chaos spheres” which are responsive to change, orderly, effective and manageable. Once the complete cycle of the model has been processed another cycle begins, where the realized end game becomes the new initial or inertial framework. The model can be applied to many organizations.

Rationale for strategics

The chaotic nature and growing complexity of the library chaos sphere (environment or framework) presents a difficult challenge for leaders charged with the responsibility for administering services, allocating resources, and adapting to and managing change.

Success depends on managing events rather than being managed by them, and therefore it essential to develop well-constructed and documented strategic plans and initiatives that are flexible, responsive and optimize the use of available resources. These plans must also allow for any meaningful intrinsic or extrinsic knowledge to be

applied to the strategic process. A complex delivery service such as a library is a non-static, complex and dynamic environment (a chaos framework or chaos sphere). In this environment the strategic planning process needs to be cyclic, simple, easy to use and flexible.

Many of the components of these chaos spheres interact with one another and can be best visualized using an illustration as shown in (Figure 2). A chaos sphere is a dynamic strategic framework or environment which identifies any given service delivery model with all of its influences and the resources to provide those services. The term “Framework” is not used directly to identify a given organizational environment since it implies a rigid structure rather than a more flexible structure as identified by the technical term chaos. Using the term chaos in its technical sense does not imply a random structure or process. The butterfly effect will not necessarily apply in the technical sense. However, small organizational changes or influences may cause a significant change to the existing structure and this is conceptually the idea or principle behind the butterfly effect. chaos spheres are strategic organizational entities or sub-entities that consist of a set of defining characteristics referred to as “Strategic Characteristics”. A library, for example, is a sub-entity chaos sphere within a university, school district, college or a branch of a public library.

Historical perspective

Before looking forward let us review the historical perspective of libraries as institutions. In my dissertation completed in 1995, a Frame of Reference for the

Changing Library Environment was constructed that provided a theoretical structure to synthesize symmetrically and thereby capture the changing role of the librarian and the library as an institution from the perspective of the past and present and enable a projection to the future. Of interest here is the construct from the past:

The library environment for the past may be characterized according to the following major components: the role of the librarian [which] is conceptualized with the metaphor “a custodian of books”. (The librarian provided access to information, collection management, client services, linkages with defined skills and expertise). Library collections, technology and user’s needs are also major components. (Wilkins, 1995, p.76)

In this construct of the past the scope of the role of the librarian and the library environment were limited but always service oriented.

The librarian provided access to information that dealt with recorded information, primarily books and manuscripts. Information was stored locally and was from current and archival library holdings. Collection management focused on selection, organization, and preservation of all library materials for library users. There were several themes from the construct of the past that are relevant for our discussion and

development of our planning process. The relevant themes are the service orientation directed toward both users' and institutions that libraries served. As well, librarians were cognizant of the need to preserve and organize materials for both current and future users. Future orientation or thinking was a dynamic element of the role of the librarian.

Maintaining awareness of user needs enabled librarians in the past to create a relevant library environment. Traditionally, libraries as an institution have been one of the key support structures that hold and deliver information to the user community. Thus, a process for ongoing planning was seen as valuable to the "InfoWorld" going forward.

A search of the literature regarding library planning revealed numerous models and key concepts that can assist in the planning process. In Bednarz (2007) a survey of key models is provided. One example is the systems model, which has a long history going back to the time of Aristotle, and is focussed on the internal environment of the library. Later, in open systems theory the interdependence of the internal environment and the larger system it serves is acknowledged and is evident in the equilibrium theory reported by Bednarz (2007). In the various models Bednarz (2007) the question of "how to deal with the future?" is raised. The CSPP is process that focuses on contextualizing and documenting the current organizational environment, identifying transition and/or transformation factors that are influencing

that environment and with the benefit of analysis, a new projected future environment is synthesized and mapped.

Guiding principles that inform the Chaos Strategies Planning Process

The Chaos Strategies Planning Process begins by establishing a contextual foundation with several guiding principles that inform the Planning Process. These principles are foundational and relevant to an organization. When you are applying this Planning Process in your own organization you will need to outline or define guiding principles that are relevant to your organizational setting, as these will establish the foundational context for the Planning Process.

While influences in any specific library environment or library chaos sphere may be different in form and content, there are many influencing factors that are common to library service delivery frameworks. In the Chaos Strategies Planning Process we begin by defining these influencing factors as guiding principles. The guiding principles used in the chaos sphere—Chaos Strategies Planning Process have been established from the transition, transformation factors and organizational needs common to most libraries. These include:

Development of political will

All strategic planning processes are subject to political influence, some of which are not in the best interests of the organization undergoing change. Unless the needs and goals are clearly articulated and a strong political will developed to support change at the outset, the desired new framework will be a kaleidoscope of political influence.

Therefore, the internal and external stakeholders must understand the impact of change at the outset and through the process, and they must support the process to manage it. The political stakeholders are in fact symbolic leaders who can support and foster effective change management. These symbolic leaders are both internal and external to the organization undergoing change.

Service delivery aligned with strategic needs of the institution

Client Services: Client services are linked to user needs. The focus of client services or user services will be specialized information research services where the librarian plays a key role on organizational committees and is an active research partner. As the electronic information services evolve, virtual users require information filtering to support informed decision-making.

Complexity and change with new technologies

Evolving technologies: New technologies increasingly play a major role influencing libraries and empowering user communities; learners, teachers and researchers, to be self-directed. It further enables the decentralization of information resources and services. It affects the nature and scope of information, in quality, quantity, integrity and security, format, storage, manipulation, and reproduction. It demands a more complex security network to insure integrity and protection of intellectual property and all aspects of the management of information.

Online learning initiatives evolving: Seamless access to information for student, teaching, resources and administrative staff is a requirement. As information access and online learning continue to evolve, learners will require access to both locally and globally distributed resources, in a variety of formats, such as print, online,

video, archival and other ephemera, ultimately all in a web-enabled environment. Information/inquiry tools for retrieval and evaluation will be required and mediation of information will become paramount.

Change in the way information is managed

Collection Management: The librarian will continue to be responsible for collection development processes, and providing pathways to remote information as in collection management, which will evolve to become a form of information management. This will incorporate collection development and management with the provision of gateways to global information sources for local and virtual users.

Effective management of budget and other resources

Management of budget and other resources including human resources: Library budget and human resource administration will be aligned with institutional processes for development and review.

Changing role of librarians and all library staff roles

Linkages: The role of librarians and library staff will be research focused and involve research consultation, extensive liaison for collections and research and will be characterized as a “partner in the research process”. The librarian will liaise with partnering organizations and associations, including universities and colleges themselves, as well as educational associations, provincial, national, and international bodies to ensure the development of relevant and timely information services. Concurrently, librarians will need to be involved with library vendors to influence the development of timely and relevant library technologies and services. Librarians will

also be involved in research to extend the profession of library and information science.

Professional development support needs: librarians and library staff will require ongoing professional development in a variety of subjects related to information management, teaching and research methods, and organizational culture and management.

Skills and expertise: The skills and expertise on the part of all library staff will continue to include maintaining an awareness of information sources, technology, and user needs, which will include both local and virtual users. Specifically, greater knowledge and expertise will be required in evaluation methodologies, information seeking behavior, and the ability to develop a vision to develop information gateways to information sources and services to meet the diverse needs of and teachers, learners and researchers.

Changing user needs and demands for teaching, learning and research

Information research needs: The user community will evolve to become more diverse, encompassing users with accommodation and accessibility needs, requiring support and education as well as users who are highly skilled with defined needs, requiring more complex information research on diverse topics. Owing to the breadth and depth of information available and the range of users' skills and needs, educators and researchers will increasingly require analysis, synthesis and informed filtering of information to effectively support decision-making. They will need teaching skills founded in information literacy.

Economic impact factors: Libraries as institutions in school districts, colleges, and universities will continue to be funded by their parent institutions and governing bodies.

Partnership: Librarians will increasingly rely on building partnerships and consortia to manage costs, and also to develop comprehensive services related to the provision of access to information for current and future users.

Grant Pursuit and Execution: Grant funding will be an avenue for librarians to pursue in seek of support for library initiatives, although as adjunct to, not replacement for, base funding. As well librarians will need to be involved with library development and fund raising initiatives to foster long term philanthropic relationships that will benefit libraries.

Legislation: Libraries will continue to monitor and influence legislators on matters related to information access, rights and privacy. In the era of “fake news” and “revisionism” it is critical that libraries continue to steward knowledge, educate their diverse user communities and be a reliable source for access to timely, relevant, accurate and secure information for current and future users. The era of “Fake news” and “revisionism” are contributions to chaos. Libraries will continue to hold culture that is past, present and future in a myriad of forms. With increasing globalization vigilance will be required to protect and promote access to timely, relevant, accurate and secure information for current and future users.

Globalization of standards, access, information sharing

Access to information: Access to information will deal with recorded information and will include multimedia and ephemeral forms, including voice, data, image, and holographic images. Information will be seamlessly accessed and transferred from anywhere to anywhere. In our increasingly global world librarians will need to continue to be involved with the development of effective and relevant standards, as well as collaborative and consortia initiatives to enable information sharing and to maintain access and for both current and future users.

Intellectual property issues: Issues around intellectual property and use of the Internet, such as copyright are becoming increasingly prevalent as more web-enabled information sources are utilized and as our technologies become smarter. Librarians will need to be involved to provide effective services, including education about ethical use of information in a world where technology makes the transformation of information almost seamless. Librarians will need to promote practices so that their user community is respectful of the rights of copyright owners, and holders of intellectual property, while balancing the users' need for access to information.

Other legal aspects, contracts, collective agreements: As our society evolves, legal matters including contracts and collective agreements, will increasingly provide the framework within which the library and librarians operate. It is anticipated that these legal matters may provide transparency to enable, the profession and library service delivery.

Education and political will of senior executives: In many complex organizations senior executives often lose touch with the realities of providing operational services. The process of fostering executive political will or enlightenment is an important part

of the planning process. Enlightenment is linked to political will and in many organizations there is formal political will and there is informal internal “institutional” political will.

Developing the Chaos Strategic Planning Process

The primary objective for creating a strategic planning process as a construct is to develop an operational organization within which resources are structured to successfully deliver required services to clients or user communities and which has the ability and flexibility to adapt to and manage change. Designing future or projected strategic frameworks can be considered as a six-phase process, with several internal steps in the phases. The following outlines the six phases of the Chaos Strategic Planning Process (CSPP):

1. Defining the end game - formulation of a strategic initiative(s) or goal(s).
2. Documenting the current environment - the inertial chaos sphere.
 - a. Determining the “strategic characteristics” of the current environment.
Strategic characteristics include major components or divisions that are unique and integral to the current environment.
3. Documenting all factors which influence and impact the current environment, including a needs analysis - these are the transition/ transformation factors.
4. Analyzing the impact of the transition/transformation factors--influence factors - building knowledge outcomes
 - a. Begin by building choices or options based on phase 3.
5. Designing a new environment. This is the synthesis phase we call framing.
 - a. In the planning process this is referred to as framing the projected

chaos sphere.

6. Adjusting the new environment to meet operational needs, goals and realities.

This phase is referred to as “modulation”. It is the process of adding information as in intelligence to the final design of a projected chaos sphere.

- a. This step also includes establishing the “endgame” to begin a new cycle.

In its simplest form the Chaos Strategic Planning Process is analogous to taking a trip. At the outset you will need to know where you want to go or at least that you want to go somewhere, which is the “endgame”. Second, you will need to know where you are. Third, you need to consider what things may impact your trip. Fourth, you will need to consider how these things may impact your trip. Fifth, you must construct a scenario as to how the trip will unfold and how you are to get to where you are going. Finally, you will need to adjust your plan as you go, (i.e., how to deal with things that may interrupt the trip). The “endgame” of course is not eternal. Once reached it becomes the new initial or inertial “chaos sphere” and the planning cycle continues. It is also a soft target that needs to be modulated through time and should be viewed as a probable outcome. Planning is a process and the process enables us to learn and adapt or evolve plans as needed to deal with ambiguity. The concept of modulation is really about how to modify or adapt plans as new information or changing information needs to be accommodated in a plan. This is why the use of the term “probable” outcome makes sense in this planning process.

Since the sum total of this process is variable and dynamic it cannot be represented as a deterministic model but rather as a chaos model. As such we refer to the total environment within which everything operates as “chaos space” and the entities within it as “chaos spheres”. An overview illustration of the Process is presented in Figure 1. This is an updated graphical version for 2018 based on the original diagram that is included in Appendix A with explanatory notes (Figure 2).

Phase 1: Defining the end game

In Phase 1 using the Chaos Strategies Planning Process, the process is to define the strategic end game. The end game is characterized as a future objective that adds value and improves the strategic advantage of the current environment. It can be a general statement such as we need to do something about the way in which we deliver services, or a specific objective such as we need to use new technologies to improve our service levels, or a complex set of strategic initiatives which may include a total reorganization precipitated by pressing political and economic impact factors. The end game defined at the outset may be somewhat soft in nature and may often not turn out to be the real end game at the end of the planning process. In simple terms things are not often black and white there is a lot of grey ambiguity that will emerge. As the planning process unfolds it will evolve based on new information learned or gained in the process. This speaks to the value of the process. Recall Shipengrover (1996) who reminds us that in planning we do not always know what we need until we are into the process. This is the intangible, the ambiguity and

the fun of planning.

As specified in the guiding principles when using the Chaos Strategies Planning Process, the first significant task will be to understand the internal politics as this key aspect of the organizational context will be needed to successfully address political will issues. Both an understanding of the issues in defining an end game and a commitment from the key stakeholders to resolve them will be a requirement for success. Real costs to carry a strategic initiative forward for example are often not clearly understood at the political level.

Phase 2: Documenting the current environment

In Phase 2 using the CSPP, the process is to document the current environment to confirm and build shared understand across the organization. Managing change clearly means changing something. Often, many of the stakeholders do not have clear information or shared understanding about where they are now, at least in terms of their current organizational environment and what is involved in the CSPP as in any planning process. It is important to document the strategic characteristics of the current environment which we refer to as the inertial chaos sphere. Once the Strategic Characteristic (SC) are documented in the inertial chaos sphere this information will be valuable to inform the key stakeholders and assist them as they build shared understanding about their current environment.

Strategic Characteristics (SC)

Chaos spheres are characterized by unique components or divisions. These components are identified as “Strategic Characteristics” for the purpose of strategic analysis and planning. A “Strategic Characteristic” can be defined as follows:

- It must be a key element in the makeup of the organization or division, for example, student enrolment, facilities, funding, collections.
- Changing an SC will change the nature of the chaos sphere; for example, a decrease in funding to a library may change its service delivery model.
- Strategic Characteristics can be categorized according to major divisions or components within an organization and this will depend on the organizational context. SCs are specific to an organization. In the example presented in the Chaos Strategies Planning Process, we identified the SCs as; political, financial, legal, structural and services. The SCs are coupled relationships influencing the complete culture of the organizational structure in terms of accountability and services. Each of these five major divisions or components will have further coupled or inter-related sub-divisions. The SCs will be determined based on each organization.
- An SC is not an “Operational Characteristic”; for example, the decision to provide services to support a centralized service desk for students is strategic; how the service is provided is operational; once the service is operational however that service delivery model becomes strategic as a structural characteristic.

The visual construct illustrated in (Figure 2) presents an overview of the strategic planning process designed in the Chaos Strategies Planning Process. Future libraries need to be successful and thereby need successful structures to deal with change.

Strategic characteristics of the current organizational environment

Political

Political strategic characteristics include political will, governance and the organizational culture. These represent components which involve establishing the mission, vision and values all within the organizational culture. For example, the endgame—what does the organization want to achieve? What is the desired outcome?

It will be important to understand the political will for the vision as this will impact influence and decision making related to change management. The work of the other major divisions will inform the political division. To be successful in achieving the endgame the work of this division will encompass pitching new initiatives or changes to the larger organization and the internal organization and as well to external organizations and partners.

These new initiatives will need to be expressed in terms relevant to each division and be coupled with the directions of the greater organization. Influencing, funding, supporting and educating others to enact or accept changes will be the key to success in the work of this division.

Financial

The financial division includes accountability and documentation related to matters such as budget management, and budget control. The work of this division will be closely coupled with the legal division. It will involve detailed budget documentation for the current organization and the historical perspective. This division will frequently provide detailed information to support informed decision making related to each of the other major strategic divisions. For example, financial information related to organizational budget, human resources, technology, and services management will be managed by this division.

Legal

The legal division in our current litigious society plays a major role in the strategic development of any successful development and management of change and generally includes accountability, negotiation and documentation related to vendor contracts and employee contracts. Also, legislation can constrain what librarians can and cannot do. Typical legal responsibilities will include legal issues related to employee contracts in unionized environments, protection of intellectual property rights, licence contracts for the acquisition and maintenance of new technologies and services, software contracts for administrative and academic needs. The role and work of the legal division will be closely coupled with and determined by the structural and political divisions of the organization. In the legal division there will be local variations and this work will be closely coupled with the larger organizational structure. Ideally, legal matters will establish transparency for the organization and the service delivery model developed for its clients.

Structural

The structural division includes organizational accountability within organizational structures. For example, the organizational chart identifies the staffing complement, reporting relationships and hierarchy. Also included in the structural division is the relationship to other departments within the organization. It is the set of underlying working relationships related to the organization of the enterprise. Within structure each employee group will have defined job descriptions, and programs for performance management. These structural elements will be determined by the larger organization. Again there will be local variations. Some organizations will have organic loosely defined documents for job descriptions, and performance management. Others will be clearly defined and structured for specific roles within the organization. It is likely that organizations will have multiple employee groups and their documentation will be determined specifically for each employee group. Physical structure is a major component for the organization to be able to support and deliver its services.

Services

The services division includes accountability for all aspects of organization operations and delivery of its services to its user communities. In this division services are reviewed, developed and implemented based on user community needs balanced within the political, financial, legal and structural parameters of the organization. For example, the development and delivery of effective library services requires awareness of the organizational culture and an understanding of the interrelationships between each of the other four divisions. In this context library

services is in one of the five divisions and is impacted by the other four divisions within the library chaos sphere.

When defining and describing these five major divisions as outlined above, it is important to be cognizant of their inherent interrelationships and interdependencies which we define as coupling. The understanding of the coupling, together with the nature and scope of the strategic characteristics will provide an overview of the organization and how it works. The major task in the Chaos Strategics Planning Process will be to follow the six steps outlined in the Process. Once the endgame is defined and the current environment is documented and the subsequent steps are followed as outlined in the CSPP the challenge will be to build a detailed working framework for a library which we refer to as the “Inertial Chaos Sphere”.

Managing change requires a formalized approach for dealing with issues and creating realistic frameworks to deal with the change. Figure 1 illustrates the process for implementing the chaos sphere model. Complete documentation is required at each step in the process.

The initial planning cycle will prove to be the most complex since it will require a learning curve to make best use of the process. For each successive cycle, details from the previous cycle will allow for a more responsive and efficient planning process and should be less resource bound.

Phase 3: Documenting transition and transformation factors

In Phase 3 the process will be to document the transition and/or transformation factors including intrinsic and extrinsic factors. Over time organizations are influenced by a variety of intrinsic and extrinsic factors which cause them to change. These factors are identified as Transition and/or Transformation Factors (TTFs). Intrinsic TTFs are those change agents arising from within the organization and may be the result of a needs analysis, funding constraints or aging technology. Extrinsic TTFs are change agents coming from outside of the organization and may result from political influence, government regulations or economic impact factors.

TTFs often act as catalysts to initiate change and are critical to developing a new strategic environment. The TTF factors can be referred to as action items in the process. Figure 1 presents an overview of the relationship between the inertial library chaos sphere and the TTFs.

The next three phases, Phase 4, Phase 5 and Phase 6, actually work together and are interconnected. They are somewhat sequential and not totally discreet phases. Information and knowledge is shared back and forth in the course of developing and completing these 3 phases and this is how the cyclical process of the Chaos Strategic Planning Process is intended to work. Once the strategic planning cycle has been completed a new cycle can be initiated using the end game chaos sphere as the inertial chaos sphere for the next strategic planning cycle.

Phase 4: Analyzing the impact of the transformation factors

In Phase 4 using the CSPP, the process involves analyzing the impact of the transition and/or transformation factors. Basically, the transition and/or transformation factors or action items are vetted, contextualized, completed and accepted for the projected new chaos sphere. They can alter or replace some of the strategic characteristics previously developed. Phase 4 involves building knowledge-based outcomes; that is meaning making choices or developing options based on the information and knowledge gained in phase 3. This process is analytical and sets the stage to inform thinking and begin considering how to prepare to begin framing a new projected chaos sphere in phase 5.

Phase 5: Framing and synthesizing to design the projected chaos sphere

In Phase 5, working with the results of Phase 4, that is, reviewing the knowledge-based outcomes and choices or options that were created, the task is to synthesize all the information and begin to frame the projected chaos sphere. In fact in Phase 5 the projected chaos sphere can be considered a “beta version” as is anticipated that it will be modulated in Phase 6.

Phase 6: Modulation to the projected chaos sphere

In Phase 6, the projected chaos sphere will be adjusted for the new environment to meet operational, needs, goals and realities. “Modulation” means adding knowledge and intelligence over time to create the new projected chaos sphere.; this can include “fine tuning” the “beta version” of the projected chaos sphere that was in development in phase 5. The projected chaos sphere can be considered complete once the modulation phase has ended and the projected chaos sphere can now be considered as a new “Inertial Chaos Sphere”. The cycle now continues, or begins again, with the establishment of a new endgame. Establishing a new endgame is the signal to begin a new cycle.

Figure 1 presents an illustrative overview of the six phases of the Chaos Strategic Planning Process. The Process will be continuous and cyclical and application of the Process as outlined can be applied to a variety of enterprise and departmental entities.

Chaos Strategies Planning Process

Six phases of the strategic planning cycle

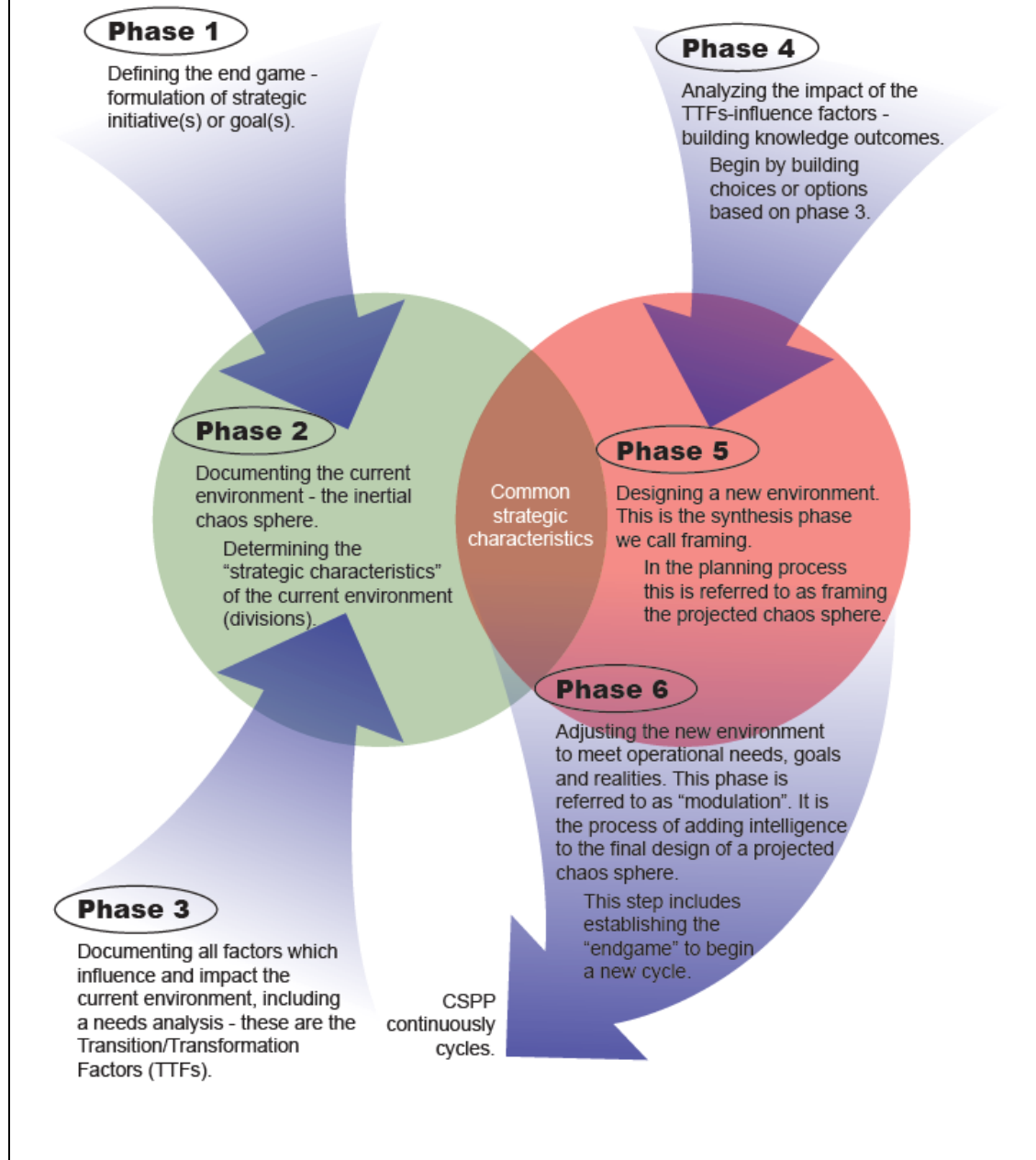


Figure 1. Chaos Strategies Planning Process 2018 (Wilkins)

Chapter Three

Introduction

In Chapter Three I will present a conceptual overview of chaos and chaos theory from a variety of perspectives and illustrate through the literature and discussion how aspects of chaos and chaos theory, while not the same, intersect and connect to one another across disciplines over time from premodern to modern times. The perspectives of chaos for review will include: classical, technical, artistic and humanist. The survey of the literature will present ideas for us to think about to gain an understanding of chaos theory and consider its contribution and possible application to managing change and influencing the creativity within successful planning. From my perspective chaos and chaos theory are effective when considered as positive, strategic and integral parts of change and the creative process.

Part One: Chaos, a classical perspective

In the review of chaos from a classical perspective we will review premodern chaos over time and across cultural boundaries. To determine the time periods for review I looked at the etymology of chaos, chaos theory and Chaos presented in the OED and decided that this etymology presented chaos beginning in 1425. But as there are references to the Greek and Latin, or classical roots of the term in the OED, I needed to look at chaos from ancient times to now and across cultures. Fortunately, my literature search revealed the 1995 article by Michael Butz, “*Chaos theory, philosophically old, scientifically new*”. For this survey of chaos over time I follow the time periods used by Butz in his survey article. Chaos theory and chaos will be presented and explored in:

Ancient civilization including Asian, Egyptian, Babylonian, Native American [Indigenous American], and Greek civilizations; Christian cosmology; aberrations since Christianity; cosmological convergence; and Poincare, beyond the renaissance man (1854-1912).

James Hite Jr.'s 1999, monograph *Learning in Chaos* also provides a brief history of chaos and chaos theory from the classical and technical perspective. Hite corroborates some of the key ideas and concepts expressed by Butz, and he reminds us that it is important to understand that chaos and chaos theory, although related, are not one and the same. He suggests that as we consider the implications related to chaos in our modern world organizations—school, work and life-- we need to look beyond the concepts of classical chaos. According to Hite:

It is important to go beyond that concept and view the changes themselves as part of the systems in which we live and participate. As such, it is important to understand how technical chaos manifests itself within our organizational systems. We need to see how we can recognize it and how we might manipulate it to the greater success of the systems. We need to understand the role that learning might play in helping us, our machines and our networks participate more effectively in a technically chaotic system.

(Hite, 1999 p. 54)

He expresses new ideas relating chaos to learning for the purpose of enabling us to be more effective and for aiding in our search for connection with humanity in the modern world. In my view Hite makes the connection between chaos as part of creativity and how learning can embrace chaos so that we can be more effective.

William Demastes', 1998 monograph *Theater of Chaos Beyond Absurdism, into Orderly Disorder* presents yet another perspective on chaos in premodern cultures, corroborating the perspectives presented by Butz and Hite, and looking forward to modern cultures to challenge us to think across disciplines. He too references our need and search for interconnectedness as part of our humanity in modern times. I concur with Demastes' ideas related to thinking across disciplines.

Butz begins his survey article stating that his intent is to portray for the reader a philosophical history about the concept of chaos that to his knowledge has not been told so far by chaos theorists. He does not claim expertise as a historian or as a philosopher; he explores the ideas of chaos in terms of its psychological meaning. I have selected this article for its breadth, conceptual mapping of chaos and chaos theory over time and its references. I trust you will find this overview thought provoking and recommend his survey article as it presents ideas about chaos from a broad variety of perspectives and (as always) the references are really interesting reading!

*Value of
history
and
breadth
of
cultures*

Ancient civilizations and chaos

Asian civilization

In ancient civilizations holistic existence that is nonlinear was understood as an integral part of these civilizations. Butz reports that the: “Chinese symbol of Yin and Yang predates Greek civilization by at least 2,000 years. The Tao symbol was developed... during 2598-2698 B.C.” (Butz, 1995, p.2)

The essence of the Tao symbol emphasized the central role of opposites and their powerful influence on one another. From the writing of Lao Tzu, Tat Te Ching, Tao is thought not to be constant or predictable but as chaotically fluid. In Chinese cosmology chaos is revealed through the Tao process and “the chaos is the seed of creation.” (Butz, 1995, p.3)

There are more recent examples in Buddhist philosophy. The integration of opposites is integral to holistic thinking and this implies chaos is part of holistic thinking processes. In the Buddhist writings chaos is referred to as orderly. The meaning presented is that chaos is

orderly, because it comes in a pattern; it is chaos, because it is confusing to work with that order.” (Trungpa, 1991, in Butz (1995) According to Butz the concept of wholeness and implicate order (Bohm, 1980) are commonplace in the cosmology of Asian people.
(Butz, 1995, p.3)

Egyptian civilization

Egyptian cosmology presents a different although similar use of the concept of chaos in its creation myth. Chaos is in the Pyramid Texts written by Heliopolitan priests in approximately 2500 B.C.. Butz refers to interpretative text by Guirand, (1965) somewhat exclusively because in his survey of Egyptian mythology he found it to be the clearest. Chaos is presented conceptually as

“chaotic waste” , “chaotic waters”, during creation coming from the Egyptians “having witnessed the apparently miraculous way in which as the floodwaters subside, the pools they leave behind soon swarm with animal life.
(Butz, 1995, p.3)

Butz observes that in both of these ancient civilizations chaos is presented in their mythologies in terms of fluidity, frequently associated with water. Historically both the Asian and Egyptian cosmologic reference is thought to have occurred at around the same time, ca. 2500 B.C..

Babylonian civilization

The Babylonian creation myth dates back to the time of Hammurabi 2000 B.C. (according to Butz who cites Jung, 1967 and Pritchard, 1950.) In the account that Jung presents there are initially three characters:

Tiamat, mother of the gods who “created everything,” Apsu, the progenitor of the gods, and Ea, son of the watery depth of wisdom that has conquered giant snakes and dragons to destroy him, [Ea].
(Butz, 1995, p.4)

The myth discussed by other scholars and in Briggs and Peat (1989), Tiamat is equated to the concept of chaos, (creation of everything) and Briggs and Peat pointed out that with Tiamat’s destruction, a new order is created by Marduk, one of the Gods.

Butz, synthesizing his survey of these three ancient civilizations, confirms that we have the concept of chaos existing in three ancient cultures.

Indigenous American civilization

According to Butz,

Many of the Native [Indigenous] American peoples on this continent have an equally nonlinear and chaotic understanding of the world in their philosophy, similar to the three cosmologies discussed earlier. [Butz acknowledges that] It is difficult, though, to indicate this in a scholarly fashion, because the Native American people by necessity have translated their history and belief systems in an oral fashion.
(Butz, 1995, p.4)

The manuscript of Chichicastenango is generally regarded as the oldest book of the Americas. It was translated into Latin from the oral traditions of its historical roots in the mid-16th century. Scholars postulate that at this point translations may have been influenced by the Christian missionaries in that time. There is ambiguity surrounding the history of this text, but Butz,

notes that scholars argue that the text reflects the cosmology of the Quiche Indian culture at that period. Again looking at the creation myth, the idea of chaos does precede the creation of forms. Butz believes that this is a tenuous conclusion. He however, notes that the type of tradition seems to be a continuation of the “chaos-order sequence”.

(Butz, 1995, p.5)

It is interesting and timely to observe that the Indigenous people of North America also share an understanding of the world in their philosophy that is holistic and rooted in nonlinearity. The holistic perspective from Indigenous people is something in 2018 we are only beginning to acknowledge, explore and coming to understand. In 2018 I participated in a “blanket exercise” that was led by Indigenous Elders at Dalhousie University in Halifax, Nova Scotia. The exercise interwove historical facts and anecdotes to tell the story of the colonization of the Indigenous peoples of Canada, by Europeans. Reflecting on the exercise I see how important it is to be informed and am optimistic that we are ready to acknowledge Canada’s and our

Indigenes past history, planning for an inclusive society and working collaboratively to build our future together in Canada.

Greek civilization

Verily first of all did Chaos come into being, and then broad-bosomed Gaea, a first seat of all things for ever... Out of Chaos, Erebus and black Night came into being...

(Butz, 1995, p. 5) referring to Kirk & Raven, 1957.

The quotation above is Hesiod's description of chaos from Theogony and may be familiar since Greek cosmology is generally thought to be the underpinning from which modern Western civilization began. The description of creation Hesiod proposed was written in 7th century B.C.. This is the standard citation in European-influenced scholarship. Butz

reports that there is another figure in Greek history – Heraclitus of Ephesus, who is now primarily known for his idea concerning the underlying unity of opposites and the essential tension between them.

(Butz, 1995, p.5)

Christian cosmology

In Butz's review he notes that Christianity arose at the same time as Greek cosmology and that scholars suggest that likely the Christian creation myth was adapted from the Babylonian creation myth. The Babylonian myth dates from approximately 200 B.C.; the Christian myth found in Genesis dates to 500 A.D.; with Christianity beginning between (B.C. and A.D.)

Christianity in Europe is thought to be largely responsible for the pervasive rationalistic attitude of the West in contemporary society. Following from this perspective chaos is bad and order is good.

(Butz, 1995, p.6)

In contemporary society we seek order and interpret disorderly ideas based on order in our world view. Butz refers to Descartes, (17th century rationalism) and notes that with the rise of Christianity the Western worldview is "intolerant of contradiction to the idea of "good", unless one is able to find a rationalistic explanation." (Butz, 1995, p.7).

Butz concludes that both cosmologies, Greek and Christian, had a considerable influence on modern thought. He suggests that this may have been "why it continues to be difficult for Euro-Americans to see chaos in any positive sense at all." (Butz, 1995, p.6).

Butz reflects that chaos theory may present us—Western culture-- with an opportunity necessary for growth. He suggests that perhaps we can now step back and view chaos from both a scientific and a philosophical perspective, dispelling fear of chaos in its literal form. This is a strong point of view and one I share.

Aberrations since Christianity

Scholars, including philosophers, scientists and others in various disciplines, have attempted to explain chaos and nonlinear forms in a philosophical scientific context. These have included the Alchemists (1500 -1700 A.D.), Kant (1724-1804), and Hegel (1770-1831) all who parted ways with the separation that proceeded from Christianity. According to Butz, “all had ideas that are now encapsulated in one shape or another, philosophically or scientifically, in the new science of chaos theory.” (Butz, 1995, p.7).

The thinking and ideas of these scholars will be explored in the review of chaos theory across the disciplines, later in this chapter.

Convergence of theories of the universe

One of Butz's findings is that in each of the cosmologic perspectives presented previously there is a period of chaos that is preceded by a new form or order. Butz refers to this as the "chaos-order sequence". (Butz, 1995, p.5)

The Chaos Strategies Planning Process will address chaos and facilitate creation of a new organizational order. Using it to map a complex current environment will reveal chaos in the analysis of the transition and or transformation factors and theoretically the mapping process will be useful to see a way through the chaos as in the "chaos-order sequence" and create a new complex organizational environment as a "projected chaos sphere".

In tracing of the history of chaos and chaos theory Hite notes that

chaos is an elemental part of human existence, wired in from the beginning through the archetype of the anima. [Jungian Psychology equates anima with soul. It is the magic that makes us believe incredible things and that life may be lived.] It is a primitive concept that humans cannot self-generate. It is built-in, and it surfaces spontaneously.

(Hite, 1999, p.70)

Both Butz and Hite present the perspective that chaos is an inherent spontaneous part of our cosmologies, and that these cosmologies continue to influence modern thought.

Thinking about Butz's reference to the chaos-order sequence I suggest that Hite's perspective is insightful as he goes a step further from Butz and articulates a connection between chaos and learning. Hite clarifies

that chaos exists as an archetype and that learning, closely tied to experience, is a way through which we cope with chaos. It is the pattern of wisdom that ultimately surfaces to aid us in our struggle to make sense of the anima. Experience and wisdom can be viewed as the integrating forces between chaos and order.

(Hite, 1999, p.72)

Hite sees chaos as elemental to our human existence and explains that through learning and experience we cope or manage our path through chaos. I think his ideas are insightful. Consider that we all solve problems, create new ideas and set a path forward to renew constructing our future. This is our human chaos with a future perspective. Hite makes an exciting and critical connection between chaos and learning derived from his view of our elemental human existence, which in turn

supports my rationale for why this study is relevant and important in the context of libraries supporting learning.

Demastes thought-provoking preface to *Theatre of chaos* alludes to similar ideas expressed by Butz and Hite. Specifically, Demastes states that in

premodern cultures, chaos was often seen as the soup of energy out of which change, creativity, and hope have sprung.
(Demastes, 1998, p. XII)

The ideas expressed by Butz, Hite and Demastes converge and challenge us to reconsider our perspective on chaos and consider it more holistically, which was a perspective adopted by some, but not all premodern cultures presented in the review of chaos over time. The review presents how chaos is reflected across cultures and recurs from ancient times to now. The survey of chaos over time has been very revealing and certainly influenced my thinking to encompass chaos from a broader perspective.

The recurrence of chaos intrigues and fascinates us and which was evident in the exhibit *Mystical Landscapes from Vincent Van Gogh to Emily Carr*, curated by the Art Gallery Ontario, 2017. In the exhibit catalogue, Peter G. Martin (2017) said the following about the scope of the exhibit and its presentation related to the fascination with chaos and cosmos:

In the nineteenth and early twentieth centuries it was becoming understood that the observable universe was much larger in in space and in time than had been imagined; but it was not infinite; matter was seen not to be eternal and union with nature was presented within an evidence-based framework.
Martin, (2017), p.273

Part Two: Chaos a modern technical perspective

The review of chaos from a modern technical perspective will include ideas from both chaos and chaos theory in the art of how they naturally intersect. The technical perspective will include the modern physical sciences and mathematics, and the social sciences incorporating business, education and information management.

Poincaré, the European connection

From Butz we learn that in the early 1900s, Henri Poincaré was part of the Intuitionist movement in France that viewed science as an artistic effort. He is known for his work in dynamical systems theory; specifically he worked on solving two-body and three-body cosmological problems. He in fact did not solve the three-body cosmological problems and in his address to the Societé de Psychologe (Butz, p.8 from Koestler 1964) he discussed how this solution rose out of nowhere.

A very small cause which escapes our notice determines a considerable effect that we cannot fail to see. Prediction becomes impossible, and we have the fortuitous phenomenon. (Butz, 1995, p.7) citing (Poincaré in Crutchfield et al., 1986, p.48)

Poincaré's work revealed that

the three-body problem can only be approximated, solving the problem with probabilities that estimate a planet's position. (Butz, 1995, p.8)

As a result, in “modern” science the importance of nonlinearity was demonstrated through his work in the early 1900s.

Poincaré provides a European connection to the survey of chaos of the past in the science of modernity. Poincaré's non-linear and artistic perspectives, as Butz observes, brings us close conceptually to Lorenz's discovery of the butterfly effect (1963). We will discuss Lorenz's work in greater detail later in this chapter.

Chaos necessary for balance and connection

In reflecting on his purpose for writing this survey article, Butz states that

continuous reference is made to the Greek idea of chaos.
Second, it seems that Christians disdain chaos. ... [Butz] contends that in certain cases it has not been safe to study or event consider certain ideas because of the Euro-Christian ethic—such as Galileo’s plight. It has been a powerful political influence pushing along the idea of order, linearity, and other similar ideas that equate to “good” at all costs.
(Butz , 1995, p.9)

Butz notes “even scientists like Hawking (1988) avoid its [chaos’s] inquiry [or the Euro-Christian ethic’s].” (Butz, 1995, p. 9).

Butz reminds us of James Yorke’s (1975) use of the term chaos to describe nonlinear phenomena and suggests that “fortunately, for the Euro-American mind, chaos now comes neatly wrapped in a nice rational scientific package.” (Butz, 1995, p.9).

Butz is well aware that his survey article considers chaos across civilizations at the most abstract level and he believes it is important to include the historical-political ramifications of embracing or avoiding chaos so that we can consider it as an opportunity for growth.

Chaos across subject disciplines

The review of chaos across subject disciplines will be a “journey” that will present ideas about chaos and chaos theory in a variety of subject disciplines in the 20th and early 21st centuries. The journey will meander, as journey’s do--around disciplines and through decades to highlight ideas and promote discussion. As Shipengrover reminds us: “chaos teaches that there are no prefixed, definitely describable destinations and that we do not know what is going to matter until we are into the journey.” Shipengrover, 1996, p.2).

I selected subject disciplines drawing on my professional experience, education and my reading of the literature. Chaos and chaos theory will be presented and explored broadly across the following disciplines:

The Physical sciences, including mathematics; the Social sciences, including business, education, information management and libraries; the Arts, including Fine Arts (Fashion, Visual Arts and Music) Literature, Theatre; and the Humanities perspective.

Chaos theory in physical sciences including mathematics

Butz presents chaos theory from a scientific and mathematical perspective buttressed with a philosophical foundation;

Chaos theory, like many other theories in physical science, was derived from a largely Western or Euro-American viewpoint. The emphasis of “science” during the past century

has largely been to explain complex systems in the simplest manner possible through linear models. In the past, nonlinear, “chaotic” types of equations or systems were mostly avoided. With the popularization of chaos theory, Western scientists, and I posit the Western culture, have been asked to come to grips with the nonlinear and chaotic aspects of their existence. Other cultures outside of the European tradition of the west, have historically valued the nonlinear and chaotic realm of existence that lie beyond the control of science or culture. Chaos theory reintroduces the philosophical roots of chaos to our Western science and culture. Although these ideas may seem to be new scientifically, and new in the western philosophical tradition, they are in fact not new at all.

(Butz, 1995, p. 2)

Butz’s perspective challenges us to think about chaos and chaos theory broadly, to consider nonlinearity in terms of chaotic systems, and of understand our existence from a philosophical point of view.

In the 1960s and 1970s chaos theory was an area of study and inquiry In the physical sciences including mathematics. *The New science of chaos*. (Gleick, 2008, p.43) was a term coined by James Gleick (2008).

But unpredictability was not the reason physicists and mathematicians began taking pendulums seriously again in the sixties and seventies. Unpredictability was the only attention-grabber. Those studying chaotic dynamics discovered that the disorderly behavior of simple systems acted as a creative process. It generated complexity: richly organized patterns, sometimes stable and sometimes unstable, sometimes finite and sometimes infinite, but always with the fascination of living things.

(Gleick, 2008, p. 43)

Gleick provides an account of the work of Edward Lorenz, who is credited with discovering the “ Butterfly Effect”. Edward Lorenz, as a young boy, enjoyed the study of weather, and he had been a weather bug, keeping tabs on the max-min on the thermometer while playing with mathematical puzzles growing up at his parent’s home in West Hartford, Connecticut. He studied mathematics at Dartmouth College, graduating in 1938 and thought mathematics was his calling. WWII intervened and he was assigned the task of weather forecaster for the US Army Air Corps. After the War he took his interest in mathematics and meteorology to begin his work at MIT. In the 1960s meteorologists and “serious” scientists mistrusted computers. Meteorology is about forecasting and mathematics which was Lorenz’s passion. Lorenz worked tenaciously, fascinated by weather phenomena and

With the aid of his primitive computer, Lorenz had boiled weather down to the barest skeleton. Yet, line by line, the winds and temperatures in Lorenz's printouts seemed to behave in a recognizable earthly way. They matched his cherished intuition about the weather, his sense that it repeated itself, displaying familiar patterns over time, pressure rising and falling, the airstream swinging north and south. He discovered that when a line went from high to low without a bump, a double bump would come next, and he said, "that's the kind of rule a forecaster could use" But the repetitions were never quite exact. There was pattern, with disturbances. An orderly disorder.

(Gleick, 2008, p.15)

Lorenz's work continued and in the winter of 1961 he was at a watershed moment. He was working to examine a sequence at greater length, and as his story goes,

he set the computer to task to re-create a sequence and headed off to get a coffee. When he returned the results of the computer produced something unexpected, something that planted a seed for a new science. ... "The Butterfly Effect was the reason."

(Gleick, 2008, p. 16,20)

Lorenz' discovery was an accident, or serendipity merely lead him to a place he had been all along. Lorenz defined the Butterfly Effect simply as “an image of predictability giving way to pure randomness.” (Gleick, 2008, p.22).

Computer modelling related to the study and research of weather continued at MIT and Reading, England. Weather forecasting was just the beginning of using computers to model complex systems. Gleick reports that; “Computer modelling had indeed succeeded in changing the weather business from an art to a science.” (Gleick, 2008, p.20).

As Lorenz continued his research the Butterfly Effect acquired a technical name: sensitive dependence on initial conditions. This thinking has a place in folklore and in science. The research community

were astonished that Lorenz had mimicked both aperiodicity and sensitive dependence on initial conditions in his toy version of the weather: twelve equations, calculated over and over again with ruthless mechanical efficiency. How could such richness, such unpredictability—such chaos—arise from a simple deterministic system?

(Gleick, 2008, p. 23)

In 2010, chaos theory continues to be of interest. Étienne Ghys shares the following commentary on the work of Lorenz in his research paper presented at the *Poincaré Seminar 2010* in France; Ghys, Étienne, “The Lorenz Attractor, a Paradigm for Chaos.” (Chaos, 2010, p.1-54)

it is very unusual for a mathematical or physical idea to disseminate into the society at large. An interesting example is chaos theory, popularized by Lorenz’s butterfly effect: “does the flap of a butterfly’s wings in Brazil set off a tornado in Texas?” A tiny cause can generate big consequences! This is a generally known and accepted fact.

(Ghys, 2010, p.6)

In this article Ghys sets out to sketch some of the main concepts of chaos theory and put it in the context of how we see it today. Ghys states that:

the close observation of the Lorenz attractor does not suffice to understand all the mechanisms of deterministic chaos, but it is an unavoidable task for this aim. This task is also quite pleasant, since this object is beautiful, both from the mathematical and aesthetic points of view. It is not surprising that the “butterfly effect” is one of the few mathematical concepts widely known among non-scientists.

(Ghys, 2010, p.1)

Ghys also understands that chaos is often described from a negative point of view.

He challenges this perspective as he sees that with chaos there is both a positive and a negative aspect which in his view work together. Ghys states that:

Chaos theory is often described from a negative viewpoint: the high sensitivity to initial conditions makes it impossible to practically determine the future evolution of a system, because these initial conditions are never known with total precision. Yet, the theory would be rather poor if it was limited to this absence of determinism and did not encompass any deductive aspect. On the contrary, I want to insist on the fact that, by asking the good questions, the theory is able to provide rich and nontrivial information, and leads to a real understanding of the dynamics.

(Ghys, 2010, p.3)

Ghys explains that within the context of chaos theory the concept of sensitive dependence on initial conditions is part of the mechanics of deterministic chaos.

Ghys considers “the butterfly as a nice gift from physicists to mathematicians.”

(Ghys, 2010, p.3).

Chaos theory in the social sciences

In the Social Sciences there is a plethora of literature on organizational management and organizational behavior. For this review I would like to draw your attention to literature that references chaos theories and change management in learning organizations and educational institutions. Beginning with an editorial written by Peter A.C. Smith—"implications of complexity and chaos theories for organizations that learn". Smith's editorial provides a summative account based on the experience of his 2003 consultation with The Canadian Imperial Bank of Commerce (CIBC). "It was established at CIBC that change could be successfully facilitated through blended application of theory such as system dynamics, and the then emerging notions of 'chaos and complexity'" (Smith, 2003, p.321).

While the all-encompassing aspects related to chaos theory and complexity were understood within the organization, in reflecting back Smith shares that throughout the consultation process the "impact of non-rational people-factors, e.g., emotion, trust, openness, spirituality were underestimated. " (Smith, 2003, p.321).

Smith reminds us that the uptake of new ideas, modes of exploration and adoption of these new ideas are dependent on management mindsets. His experience reveals that management mindsets impact every aspect – implicit or explicit-- of what people actually think and do. He cautions that the process of creating the new state of change, the desired new environment envisaged in chaos and complexity while maintaining stability, is one of the most important functions of the newly defined management roles. I agree with Smith's findings to some degree and suggest that the

uptake of new ideas, and adoption of new ideas is dependent on the mindsets of all members of the relevant organization in all roles, not only management as he suggests. The Chaos Strategies Planning Process attempts to address these and other change factors with the identification of intrinsic and extrinsic transformation factors.

Looking at the literature related to chaos and chaos theory and education broadly I discussed the writings of Shipengrover, Murphy, Mossberg, and Richey earlier in Chapter 1. Now I am looking at the literature specifically related to organizational change within the context of education and am sharing an interesting article for your consideration by Terence J. Sullivan published in 2004. Sullivan makes the case for using multiple system theories to describe organizational change in an education context. He discusses the viability of complex systems theory, evolutionary theory and chaos theory as metaphors for providing a viable context to give a global perspective within an educational setting. He presents a rationale for “using chaos theory as part of a much larger theory of evolution and complexity.” (Sullivan, 2004, p.43).

In his view, chaos theory is useful as part of an emergent phase of decision-making and change management. He notes that “at some point in people’s individual and organizational learning, a certain global understanding of the complexity leads people to appreciate their place in their global network.” (Sullivan, 2004, p.53).

In Education, the theme of globalization related to chaos, is also addressed by Mossberg, who provides a prescription for global leadership to which chaos is integral and she argues that

the new science of chaos mandates a view of institutions and of the role of leadership that is profoundly optimistic—and even, in the classic meaning of the work, comic.

(Mossberg, 1993, p.5)

She suggests learning to understand chaos will provide a lens to visualize problems, situations, and strategies, specifically about the nature and role of organizational leadership in dealing with change and diversity.

(Mossberg, 1993, p.50)

Mossberg refers to chaos as an oxymoron. Let's think about this in terms of our current environment based on her analysis: demographics are changing, cultures are becoming more diverse and migratory, technology makes us truly global, and interconnections are no longer optional. In other words, we are increasingly interdependent, joining different cultures with different views on how things should be done and why, which means conflict has increased while at the same time we have grown closer, have greater access to different views than ever before, and thus more potential to reduce conflict than ever before. In thinking about our global world and society today as reported in the new media, we are seeing more unpredictable conflict. In times of organizational change there is evidence of increases in incidents

of lateral violence. “Lateral violence is a worldwide occurrence and is a learned behavior as a result of colonialism and patriarchal methods of governing and developing a society.” (Native Women’s Association of Canada, Lateral violence fact sheet, 2015, p.1). Lateral violence can be manifested in many ways and the root cause is the nature of the imbalance in power relationships that can exist in organizations or groups. “When a powerful oppressor has directed oppression against a group for a period of time, members of the oppressed group feel powerless to fight back and they eventually turn their anger against each other.” (Native Women’s Association of Canada, Lateral Violence Fact Sheet, 2015, p.1).

Mossberg continues her argument stating that chaos isn’t chaos. Rather, chaos is an expression of infinitely complex order. Chaos (the theory) is founded on an accumulation of evidence that chaotic-looking behaviours may be manifesting order in patterns visible only from a distance of time or space. Chaos sees movement, growth and change as orderly processes of things becoming different over space and time.

(Mossberg, 1993, p.50)

Mossberg is suggesting Chaos has a sense of patterned order that is viewable from a distance and this matches my concept of considering the view from the clouds at 30,000’ to inform one’s thinking and planning. This high level view provides breadth to take in the big picture in a holistic manner.

In, the field of Public Relations Priscilla Cottone outlines how the discipline is evolving to address the traditional scientific world view and encompass a broader perspective for the process of critical research. This process involves exploration of key questions stemming from the new science of chaos. She argues that the new science of chaos opens up to incorporate multidisciplinary perspectives and is informed by information that traditional science omits. Interestingly enough she begins her article reflecting on the work of Thomas Kuhn:

When Kuhn (1962/1970) first suggested that science does not progress smoothly, adding one block of knowledge to the next, but rather grows in sudden spurts, in revolutions often fomented by individuals who live in academic crevices of interdisciplinary thought, he created what he predicted—a revolution in science. Thirty Years ago Kuhn’s ideas were considered radical, outside the mainstream. Today Kuhn is acknowledged as one of a number of scholars who opened the door to a re(dis)covery of the art and poetry of science.
(Cottone,1993, p.168)

Kuhn’s vision and clarity for observing simple truths from a peripheral view continues to be acknowledged as foundational for forward thinking ideas that are

relevant today. From my perspective Kuhn’s writing, now half a century old, resonates today for his thinking about the “art and poetry of science“.

Chaos theory in business literature

Tom Peters authored *Thriving on Chaos* a key monograph in the business literature in 1987. The book is about how we must change – revolutionize our thinking to manage in the future, and it was quite extraordinary in 1987. In my role as an education librarian, in the 1980s, this was one of the most sought out publications.

In the Preface, Peters shares his “great debate” and how he arrived at the title *Thriving on Chaos*.

The book is about a revolution in thinking and Peters was adamant about “revolution”. The great debate was about the choice of a preposition: “amidst” or “on”. The competitive situation was chaotic—so “chaos“ was easy. And it’s not hard to sign up for “thriving.” He landed on using the preposition “on” as this was in his view more proactive and being proactive would be key in the revolution for the future. Winners of tomorrow would need to deal proactively with chaos.

(Peters, 1987 p.xi, xii)

Peter Senge's 1990 monograph: *The Fifth Discipline: the art and practice of the learning organization* presents an elegant description of the "Shift of Mind". (Senge, 1990, p.68) that he sees is required to learn, and solve problems in our complex, cyclical and changing world. He is an advocate for adopting a linear *and* a non-linear approach to learning and solving problems as required. He refers to this as "seeing interrelationships rather than linear cause-effect chains, and seeing processes of change rather than snapshots." (Senge, 1990, p.73).

Moving forward to 2010, the business environment continues to be dynamic and in continuous change. This is evident in the literature where authors continue to probe and be inquisitive about chaos theory in relation to change in information and knowledge management settings. For example, Peter Smith writes about the knowledge lifecycle, stating; "The lifecycle consists of four stages: creation, mobilization, diffusion, and commoditization. It is the first state, knowledge creation which has the most direct implication for the role of chaos theory in knowledge management theory." (Smith, 2010, p.118).

Smith suggests chaos theory provides a new orientation that focusses more on a process rather than a structural systems approach when solving problems in an knowledge management environment, states that: "The role of the knowledge manager should therefore be to embrace chaos to facilitate knowledge creation." (Smith, 2010, p.120).

Smith cites Google and Pixar as two companies that have successfully embraced this approach for knowledge creation. Adopting chaos theory as an approach to problem solving fosters broad communication including lateral and vertical communication. Working in environments with a high degree of ambiguity requires leaders to communicate widely and this contributes positivity to the organization and as a result knowledge creation thrives.

Connecting classical and technical perspectives on chaos

Citing Peters, Hite identifies three themes that relate to organizational thinking in the 1990s: a global world is now the perspective for many organizations; more flexibility is needed in the marketplace; and continuous innovation is a given. Hite states that with these three themes in mind: “That is— excellent firms of tomorrow will cherish impermanence—and thrive on chaos.” (Hite, 1999, p. 73)

Hite reminds us that in the classical sense, chaos is neither totally good nor totally evil. It is something we accept as part of history. In modern organizations we seek to understand how systems operate, evolve, manage change and continuously reinvent themselves. Part of our purpose is to understand change, but also to improve to enhance success in the midst of change. Chaos is not something we want in successful enterprise activities. It is accepted in the classical sense. Hite suggests that “to accept chaos as an operating reality might be possible if we understand how the chaos itself operates. This in his view brings us to technical chaos and the acceptance of chaotic activity in organizational systems.” (Hite, 1999, p.74).

Hite declares that in his view technical chaos begins with organizational theory. He uses the term technical chaos as a way to distinguish mathematical, scientific, or theoretical chaos from the form of chaos we have described and reviewed as a classical perspective. Broadly speaking I concur and note that Butz references Poincaré, in his survey of chaos over time,

it seems that in chaos circles, Poincare, the father of dynamical systems theory is known chiefly for two ideas. First, he is known for solving the three-body problem (or not solving it, actually). Second Poincaré has become known through his address to the Société de Psychologie, in which he discussed his creative act of Fuchsian problems and how the solution arose out of nowhere.

(Butz, 1995, p.8)

Butz elaborates stating that Poincaré viewed science as an artistic effort. This is where I see technical chaos beginning as this is where Butz begins the discussion of science, physics, mathematics and philosophy related to modern European thought. (Butz., 1995, p7) It is really interesting to take note of Poincaré for making the connection between science and art in relation to chaos. This is a thought I will consider later in my reflections and discussion about how ideas and theories of chaos begin to converge.

I recently read Michael Harris' (2017) *Solitude A singular Life in a Crowded World*.

He discusses some of what he learned from visiting the Cognitive Science of Thought Laboratory at UBC where he went to find out if daydreaming matters. Cognitive science research at UBC is exploring “undirected thought processes” shop talk for daydreaming and mind wandering.

(Harris, 2017, p.46)

Harris explains this as “the brain doing intensive work where the conscious mind is unaware of this work so thoughts emerge without our anticipation or understanding. They emerge from the blue.

(Harris, 2017, p.49)

Similarly, Kalina Christoff's (UBC) “new vision of a well-tuned mind included an interplay between concentration and stream of consciousness. Over-exercise one or the other and you impair the functioning of the whole apparatus.” (Harris, 2017, p.51)

She sees “solitude as a pathway connecting the analytical mind with the wandering mind.” (Harris, 2017, p.51) and states that daydreaming is an inherently creative process. From my perspective I understand the connection between daydreaming and creativity and by extension see this as connected to chaos. Is chaos part of our creative process? Is this what was implied in the OED chaos definition 5: “The natural or preferred environment of a person or thing; element; abode.” (OED.) In

my view chaos is part of the creative process and perhaps this was the implication in the OED chaos definition 5. The challenge is how to conceptualize or think about chaos and use it constructively and creatively for problem-solving.

Part Three: Chaos an artistic perspective

My review of chaos and chaos theory from an artistic perspective is approached from a personal perspective. Here I am sharing several ideas and concepts that I see as related broadly to chaos; these ideas and concepts were gained through personal experiences and reflection in the arts and in the literature.

Chaos in the fine arts

I begin with observations from my recent visit to the Royal Ontario Museum for the Christian Dior exhibit. The exhibit was all about fashion design, the society in which Dior created his designs in Paris and our more local Toronto scene where a few were fortunate to wear his creative fashions. The exhibit was a rich archive of fashions, patterns, fabric colour swatches, film footage, and design drawings. It is fortunate that these archival gems have been preserved and cared for over the decades. This speaks to the critical inherent value of libraries and archives in our changing world. The exhibit portrayed visual and cultural detail that revealed Dior's creativity and addressed change in Parisian society during his tenure in Paris. Dior's designs epitomized femininity and celebrated the female form. Through the exhibit I learned fashion design techniques changed radically with Dior's work as he creatively worked with fabric to provide comfort and grace with flowing lines. Prior to Dior

fashion was structured and very tailored to minimize the need for fabric: Europe was recovering from WWII and resources such as fabric were limited. Dior opened design and fashion to ideas about balance, form, colour, graceful lines and flowing fabric. In my view through, design Dior inspired women and men to recover from the chaos of wartime and to enjoy glamour in their lives through fashion.

Chaos theory in theatre

The world of theatre presents many ideas, reflections and learning. The plays of Tom Stoppard, for example, are eclectic. He drew from the world of science, philosophy, chaos theory and much more. John Fleming states that, “Cumulatively, Stoppard’s work has been concerned with the social moral, metaphysical and personal condition of being human in an uncertain world”. (Fleming, 2001, p.1-2) Fleming’s synthesis of Stoppard’s plays is timely and relevant for our changing world today. We learn from Fleming that Stoppard, having read the work of James Gleick, *Chaos: The Making of a New Science*, knew he could use chaos theory for the foundation of a new play; *Arcadia*. Fleming provides a detailed analysis relating *Arcadia* to chaos theory in many aspects of the play, including the setting with scenes alternating between time periods, the 1800s and today, and the characters’ discussion of chaos theory is part of the plot in both time periods. In the past, Thomasina theorizes ideas on chaos; in the present, Valentine educates the characters and audience about chaos. Fleming sums up *Arcadia*, as a work that dramatizes “Stoppard’s world view of life’s being comprised of a complex, dynamic interaction of randomness, determinism and metaphysics.” (Fleming, 2001, p.207)

Chaos theory in visual arts

The visual arts provide us one kind of opportunity to reflect back on ourselves and our humanity. This can be challenging, provocative, and inspiring all in relation to our own reality. Thinking about visual arts, Philip Glass states that “the rate of change in the visual arts world was far, far quicker that could ever happen in the music world. The world of painting expected innovation and new ideas.” (Glass, 2015, p.80).

Ocean Wave, influenced my thinking and reflection over time as it was part of my daily environment. (Hodgson, 1988). Momentum of the waves, the depth of colour, the layered brush strokes, served to evoke chaos in my sphere. The painting was a source of inspiration, energy and renewal for my persona.

Chaos in music

Music can be a pathway forward, leading us through chaos into a new realm. I share two reflections, one from personal experience and one from a novel, that provide heartfelt context about how we emerge from chaos and move forward with creativity and positivity:

Several summers ago, (July 2015) I attended the Tanglewood Summer Music Festival and heard a moving performance by the Young Artists Orchestra. The play bill included; Aaron Copland’s, Suite from Appalachia Spring and Edward Elgar’s Enigma Variations, Op.36. The performance was wonderful and the emerging artists were inspiring to hear. They clearly enjoyed performing their music. As a prelude to the program the conductor, Ankush Kuman Bahl, shared a reflection about the power

of music. He told us that he was studying conducting in New York City at the time of the 9/11 attack. He recounted that after that tragic day audiences came in droves and packed the concert halls across New York City. He shared that research studies tracking attendance have confirmed his reflection. The power of music performance brought people together as way of seeing through the tragic events of 9/11.

The Cellist of Sarajevo, written by Steven Galloway is a story of war and the destruction it creates, but also of recovery and renewal in the face of the chaos of war. One man, a musician sets out to play his cello:

And so today, like every other day in recent memory, the cellist sits beside the window of his second-floor apartment and plays until he feels his hope return.

(Galloway, 2008, p.xvi)

*Creativity
and
convergence
of many
disciplines*

Thinking about chaos theory in relation to music reminds me of the concept of strange attractors which is one of the foundations and central assumptions of chaos theory. Strange attractors flow and connect yet, appear to wander continuously and unpredictably. The theory tells us that the wandering is within context referred to as a “bounded range” in Chaos theory. In musical terms this is similar to improvising on a familiar melody. These reflections highlight the power of music and this is how I find my pathway through chaos and make sense of reality in times of tumultuous change. Music leads the way for me to come to terms with and view the world with a new perspective.

Part Four: Chaos, the humanities perspective

Reflecting back to move forward

The following is a series of quotations reflecting on the writing of Simone de

Beauvoir:

“The knowledge gained from humanistic research is considered to be the cornerstone of well-functioning democracies.”

(Pettersen & Bjornsos, 2015, p.1)

In today’s world, where religious fanaticism and totalitarian ideologies are gaining ground, continuous discussions of the human-made religious, social, and cultural expressions in the humanities are more relevant than ever. Moreover, when the inequality in wealth and resources is continuing to increase, we hold that the focus of the humanities on human beings and their worldly lives is highly imperative.

(Pettersen & Bjornsos, 2015, p.3)

Beauvoir’s inter- and cross-disciplinary approach is a model for the development and renewal of the humanistic disciplines in contemporary society, and there is much to gain by studying her novel method as a contribution to the advancement of the humanities today.

(Pettersen & Bjornsos, 2015, p.5)

Humanistic research and study teach us not to forget experiences and knowledge of the past, but to reflect upon them and use our collective memory to better address the needs of today's society. For example, to enable citizens to actively participate in the continuous effort to build and defend democracy, key humanistic methods such as critical analysis and interpretation are required. In contributing to the education of today's and tomorrow's citizens, the humanities need to interact with society. This is another example of where Beauvoir's work and life offer an excellent model. Her thinking—rooted in humanistic traditions and at the same time inspired by the ethical and political questions of her time—aims at concrete action and engagement.

(Pettersen & Bjornos, 2015, p.6)

I present these quotations and reflective perspectives in a sequence as they inspire us to think holistically and encourage dialogue, engagement, and discussion to foster action in contemporary times. I believe there is value in reflecting back to move forward and Simone de Beauvoir's writings from the mid-20th century provide a reflective and meaningful lens while continuing to be relevant as they are discussed by 21st century scholars for their insight into the contemporary world. When I read these passages I breathe and see the big picture where we are an engaged inclusive community, working collaboratively, using evidence and research strategies to

address our needs for creating a better world for generations to come. This is an opportunity to consider the Chaos Strategics Planning Process as a way of mapping the current environment and looking at intrinsic and extrinsic transformation factors to project a probable future environment. This is the how the Chaos Strategics Planning Process is intended to work at 30,000' with an eye to planning and moving forward to the future. Essentially we are responsible to influence and create the future world environment we want. We are in charge of our destiny, however "chaotic" the times may be. Or, perhaps we are in charge of our destiny because chaos is both path and destination for human being.

Chapter Four

Introduction

In Chapter Four I will share my reflections on the review of chaos and broadly relate the ideas about chaos at a high-level to the Chaos Strategies Planning Process. My purpose will be to synthesize ideas and suggest future directions.

To begin I acknowledge that, now in 2018, chaos terminology is beginning to be popularized and is voiced in our everyday vernacular language and our multi-media infused connected world. In John McCarthy's 2006 monograph *Remapping Reality: Chaos and Creativity in Science and Literature* we learn that the science of chaos and complexity, is evident in books, articles, dissertations and Web pages and is proliferating across popular literature as well. McCarthy notes specifically the recurrence of references to Gleick's national bestseller, *Chaos: Making a New Science* (1987). There is much debate about Chaos theory according to McCarthy, for example, a debate between Gleick and Brugge that continued over three issues of *Der Spiegel* in 1993, and yet he concludes that no one really knows what chaos is. I suggest there is more in his observation for us to consider and that we do have a variety of perspectives on chaos, which may be culturally rooted.

In the late 1990s, Peter Weingart and Sabine Massen detailed the spread of the term "chaos" from its original scientific roots across the disciplines in the social sciences

*Humanity
is the
center of
our
existence*

*Our role
is to
create,
direct &
own the
future*

and humanities in a scholarly essay entitled: “The Order of Meaning: The Career of Chaos as a Metaphor.” (McCarthy, 2006, p.17).

Science Citation Index and the Social Sciences Citation Index are information management tools that enable investigation of the use of terminology over time.

John McCarthy studied both of these indices for the frequency of the use of the term chaos: in 1974 “chaos” or “chaotic” was found in 23 publications; by 1996, that number had risen to 1,008. As well documents indexed that used the term chaos crossed many social sciences disciplines. The humanities literature is more difficult to analyze and McCarthy did not investigate it. My search of the literature was organic and interactive taking place over many years. With the benefit of time I retrieved a variety of information resources—monographs, journals and ephemera—that address chaos and chaos theory across many disciplines and this was how I observed chaos as a useful corrective to linear and rational thought, which is not easily susceptible to information retrieval systems.

The intriguing and provocative point that McCarthy makes is

the rise of chaos as a catch-all phrase has signaled a growing sense that we have discovered a new tool for remapping our image of reality. It is this latter function of the term “chaos” that continues to be attractive He [McCarthy] draws on Nietzsche’s famous line in aphorism #109 of *The Gay Science*: “the total character of the world is essentially chaos”. (McCarthy, 2006, p.17)

Nietzsche's writing holds the view that chaos is the key to creativity and renewal is permanent in nature. I concur with McCarthy and Nietzsche and find the direct connection between chaos and creativity to be the core of how I consider and think about chaos. As well, the cyclic nature noted with renewal is integral to the Chaos Strategics Planning Process.

After reviewing the literature on chaos theory and chaos more broadly across disciplines in preparation for writing I sense that we have many ideas about what chaos is from a variety of cultural perspectives, even if, noted by McCarthy, it is important to distinguish between the terms chaos theory and chaos more broadly. These terms are not synonymous.

Now in 2018, I too see that the use of the term *chaos* is becoming popularized: meaning that it is used with increasing frequency in various news media and popular journalism. It is on the verge of become part of our vernacular -- everyday speech. However, the increasingly popularized interpretation of chaos is that of chaos is a metaphor for disorder and disarray. Chaos is easily overused and misappropriated. *Chaos theory* is not part of our everyday speech. I suggest we reframe our thinking about Chaos, by learning from chaos theory that chaos is a pathway that we travel to make sense of the world and to create the future we want.

Planning now and into the future

Citing Cage, Glass says is that in

music there is no such thing as an independent existence. The music exists between you—the listener—and the object that you are listening to. The transaction of it coming into being happens through the effort you make in the presence of that work. The cognitive activity is the content of the work.

(Glass, 2015, p.96)

As a musician this makes sense to me. When performing a piece of music the content of the music is my performance of it. My performance is my interpretation which stems from the learning of the musical score. I along with the audience have a role to play – I interpret the music in performance and the audience has the role of listening to my performance. Ideally as I perform, I too listen to the music. This is a very critical element—it is the heart--of live and recorded performance.

Philip Glass rounds this idea out even further:

The ideal way of performing, to my way of thinking, would be when the performer allows the activity of playing to be shaped by the activity of listening, and perhaps even by the activity of imaging listening.

(Glass, 2006, p.97)

Now consider thinking within the context that Cage and Glass suggest the interpreter of the music—that is, the performer who plays the music--has a role and contributes to the process of performing the music. This is I believe a modern perspective. In fact this is how I see readers using my Chaos Strategics Planning Process.

Interpretation and performance of the process make it meaningful and relevant for readers, thinkers, planners for today and tomorrow.

Chaos theory: as a metaphor

Let's explore the work of Priscilla Murphy published in 1996. Murphy states that the literature related to chaos theory in the 1990s was fragmented and chaos was a “complex” brew being written about within several disciplines. “In fact, chaos theory appears relevant to such a broad array of disciplines that some view it as a scientific version of postmodernism; a scientific metaphor for late-20th-century cultural values of relativism, plurality, and chance.”

(Murphy, 1996, p.96).

Her point is that in 1996 chaos theory is relatively new and relevant to a broad array of disciplines, some of which include: the natural sciences (in the 1970s), the social sciences (in the 1980s) and recent applications include epidemiology, ecology, geography, economics and social organization (in the 1990s). Some view it as a scientific version of post-modernism. Drawing on the work of Richard Lucking, “Chaos—The origins and relevance of a New Discipline,”

Project Appraisal 6 (1991), pp. 23-32. Murphy (1996, p.111) She [Murphy] characterizes this shared interest in chaos theory across so many fields as a manifestation of postmodern times. I find her reference to postmodernism intriguing, almost surreal, and the idea of framing chaos theory as a scientific metaphor for the 21st century gives me pause as postmodernism is conceptually complicated, hugely complex and beyond the scope of this writing, although from my perspective, I have introduced ideas related to postmodernism, post modernity and chaos theory through music and visual arts. It seems that potentially chaos theory may even be broader than a scientific version of postmodernism; a scientific metaphor as Murphy suggests. For me, when thinking about the ideas expressed by Cage in Glass's writing about music and Cage's reference to the visual arts as leading change and innovation, I see a potential pathway to connecting postmodernism, post modernity and chaos theory.

I think that we can consider chaos theory as a broad scientific metaphor in our early 21st century world. Yes, we are experiencing tremendous change, like all generations before us, and all generations to come in the future. While I understand we are living in a time of tumultuous change I believe this is part of our humanity and is true for all generations, those before us and those to come. As leaders it is incumbent on us to think kaleidoscopically, to me this means take a broad perspective, consider many points of view beyond the familiar –

consider linearity and non-linearity, cause and effect and influence, strange attractors, scale, feedback, phase changes, self-organization and renewal, all of which are elements of chaos theory.

(Murphy, 1996, p.95)

and these are key ideas framing, the connection between Chaos and creativity.

Murphy explores some key concepts of chaos theory and notes that the very term chaos theory is somewhat misleading.

She clarifies that although chaos theory incorporates elements of chance, chaos in her view is not random disorder. She suggests that chaos theory attempts to understand the behavior of systems that do not unfold in a linearly predictable conventional cause-and-effect manner over time.

(Murphy, 1996, p.96)

She suggests viewing the system as a whole as this is how patterns and structures can be revealed or observed. She cautions that it would not have been possible to predict future direction solely based on past history, which is where chaos theory fits in.

Murphy states that chaos theory has its own features and terminology and she outlines these in her article laying the foundation based on these central assumptions.

With this perspective in mind I suggest we step back and look at the whole picture.

This big picture perspective is a fundamental concept that Kenneth and I discussed and built into the Chaos Strategics Planning Process. We used the phrase “*project a probable future*” and based on the application of the Planning Process this was what we saw to be the probable outcome.

How do we create a proactive probable future model?

Social media is now accepted and embedded as part of our daily environment across the globe 24/7. We can be anywhere, dialogue with anyone in real time thanks to social media. Our attention spans have been steadily fracturing in this age of social media and putting us into a reactionary mode. The Chaos Strategics Planning Process is a more proactive approach and I suggest potentially counters reactionary behavior.

How do we establish the scope of strategic planning – where does it begin and end?

This is an interesting question and following the design principles of the Chaos Strategics Planning Process strategic planning is ongoing and dynamic, cyclical in nature by design as presented in the Chaos Strategics Planning Process. Recall Shipengrover states that our state of change is: “A state that has been described as ‘permanent white water’.” (Shipengrover, 1996, p.2).

In fact if we follow the Chaos Strategics Planning Process as illustrated (Figure 1,2), the process is continuous!

Plans inherently evolve and change over time. Shipengrover suggests that

the new rules suggest that order emerges from the “messiness” of disorder through experimentation and trial and error.

Unlike models of planned change, chaos teaches that there are no prefixed, definitely describable destinations and that we do not know what is going to matter until we are into the journey.

(Shipengrover, 1996, p.2)

I concur with Shipengrover and note the planning process is as important as the plan. We are on a continuous journey, making our pathway through chaos, learning as we go, and this inspires creativity.

In the course of the review of chaos and chaos theory we looked across disciplines and from my perspective there are many interesting and intriguing connections for exploration. Demastes (1998) in the Preface to his monograph Theatre of Chaos refers to scientists of chaos as

chaoticians—challenging the static newtonianism that has existed and has demonized chaos. These new scientists echo a premodern vision—nonlinearity- arguing this best describes our world.

(Demastes, 1998, p. XII –XIII)

In his view these scientists are catching up to the arts. Demastes' key point here is that the results could very well lead to an

interdisciplinary reintegration of the arts and sciences through a large feedback loop wherein one discipline helps to crystallize the musings of the other and vice versa.
(Demastes, 1998, p. XIII)

Demastes calls for an interdisciplinary cyclical approach integrating the arts with the sciences. This is a dramatic idea suggested in 1998 and today in 2018 I believe interdisciplinary approaches are integral to how we solve problems, create and innovate collaboratively to construct the world we want.

The Chaos Strategies Planning Process was presented and discussed in Chapter 2. The Chaos Strategies construct presented in the illustration (Figure 1) has been revised for 2018. In appendix A the original Chaos Strategies diagram is included as created by Kenneth G Wilkins. The diagram incorporates elements of mathematics including equations and syntax and are germane to the text and to the thinking – they present a high level mapping and perspective on a cyclical process.

My reflections on the survey of chaos

Reflecting on the review of chaos over time what did we learn? How do we pull this altogether to make sense of it within the context of the Chaos Strategies Planning Process?

As I reflect on my review of chaos over time my thinking and perspective is grounded by McCarthy:

The guiding principle in these reflections on the nature of chaos and creativity is the importance of perspective, of gaining the right perspective. If we wish to experience something new, we must learn to see things in a new way. Attitude is the key to changing how we see things. (McCarthy, 2006, p.259)

McCarthy has elegantly synthesized the value in finding what he calls the *right* perspective, meaning to experience a new perspective in order to explore and experience newness and uses chaos as the pathway. Chaos is a pathway to foster creativity and manage change which is fundamental to our human experience and endeavours as we go forward and renew into the future.

You may be wondering why I chose to review chaos over time from ancient times to now, following the time periods suggested by Butz. As I followed his survey it struck me that we, humanity, have always been interested in and intrigued by creation and we continue to pursue the big questions around how our universe came to be and why and how do we fit in this universe. Through my review of the literature human interest in creation and the universe more broadly was corroborated and continues to

pique our curiosity. Creation is a myth with a positive outcome. Butz looks at chaos from a broad philosophical perspective covering some of the history of chaos across cultures, over time and opens our thinking to ideas expressed in other cultures. Perhaps by opening our thinking to other cultures and their perspectives we can learn about chaos and at the same time gain insight into other cultures. In the survey I see the creation myths through several cultural perspectives and several of these position the concept of chaos as holistic, which I understand and this encourages me to position and think about chaos in a positive frame, as a part of the creative process. I hope we can begin to consider the term chaos in a positive perspective contributing to creativity and growth through learning. Think about the following questions-- Does this mean chaos is part of the change process and is it necessary to arrive at or create a new form or order? Is chaos part of how we grow, learn, generate new ideas and build wisdom? These are my questions and how I make the case for Chaos as Creativity.

*Chaos
as
Creativity*

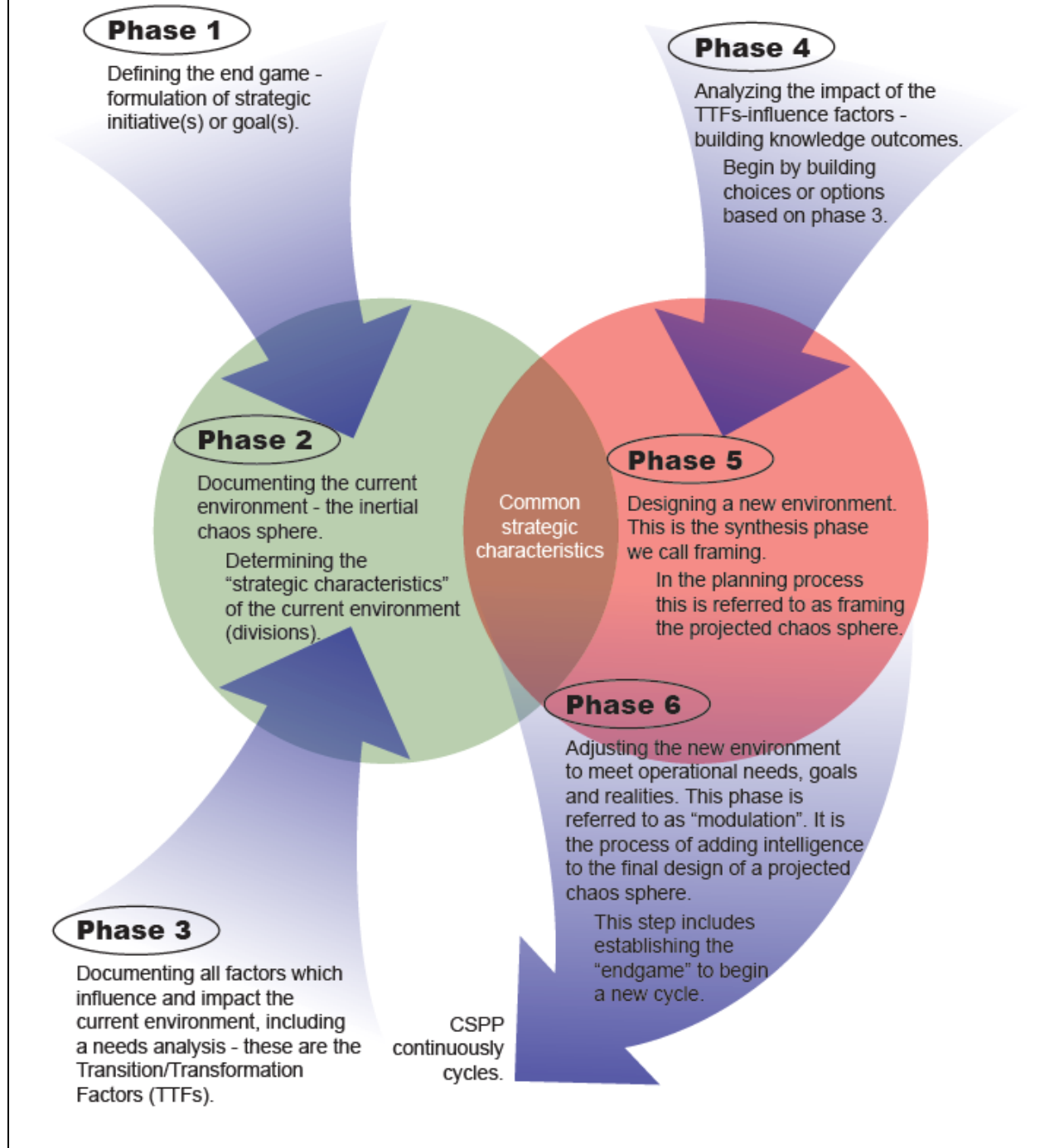
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Chaos Strategic Planning Process

Six phases of the strategic planning cycle



¹ Chaos Strategic Planning Process

¹ Wilkins, Catherine. (2018)

Appendix A

Explanatory notes for Appendix A.

Appendix A presents the final diagram of the Chaos Strategies Planning Process that Kenneth created in 2012. The title of this diagram is **Strategic Chaos Sphere Process Model** as Kenneth intended. The original diagram is foundational to the **Chaos as Creativity** manuscript and in Chapter 2 it is outlined with a streamlined illustration updated for 2018. The diagram outlines the strategic planning cycle in its original nine stages, rather than six, and the mathematical equations embedded are based on symbolic logic and are valuable for those interested in documenting strategic planning to construct a probable future model. Kenneth was a strong advocate for strategic planning, for challenging the status quo, for provocative discussion and for documenting ideas and work in written form.

STRATEGIC CHAOS SPHERE PROCESS MODEL

NINE STAGES OF THE STRATEGIC PLANNING CYCLE

The ninth stage is initiated by reaching the end game objectives where the "Projected Chaos Sphere" becomes the new the "Inertial Chaos Sphere"

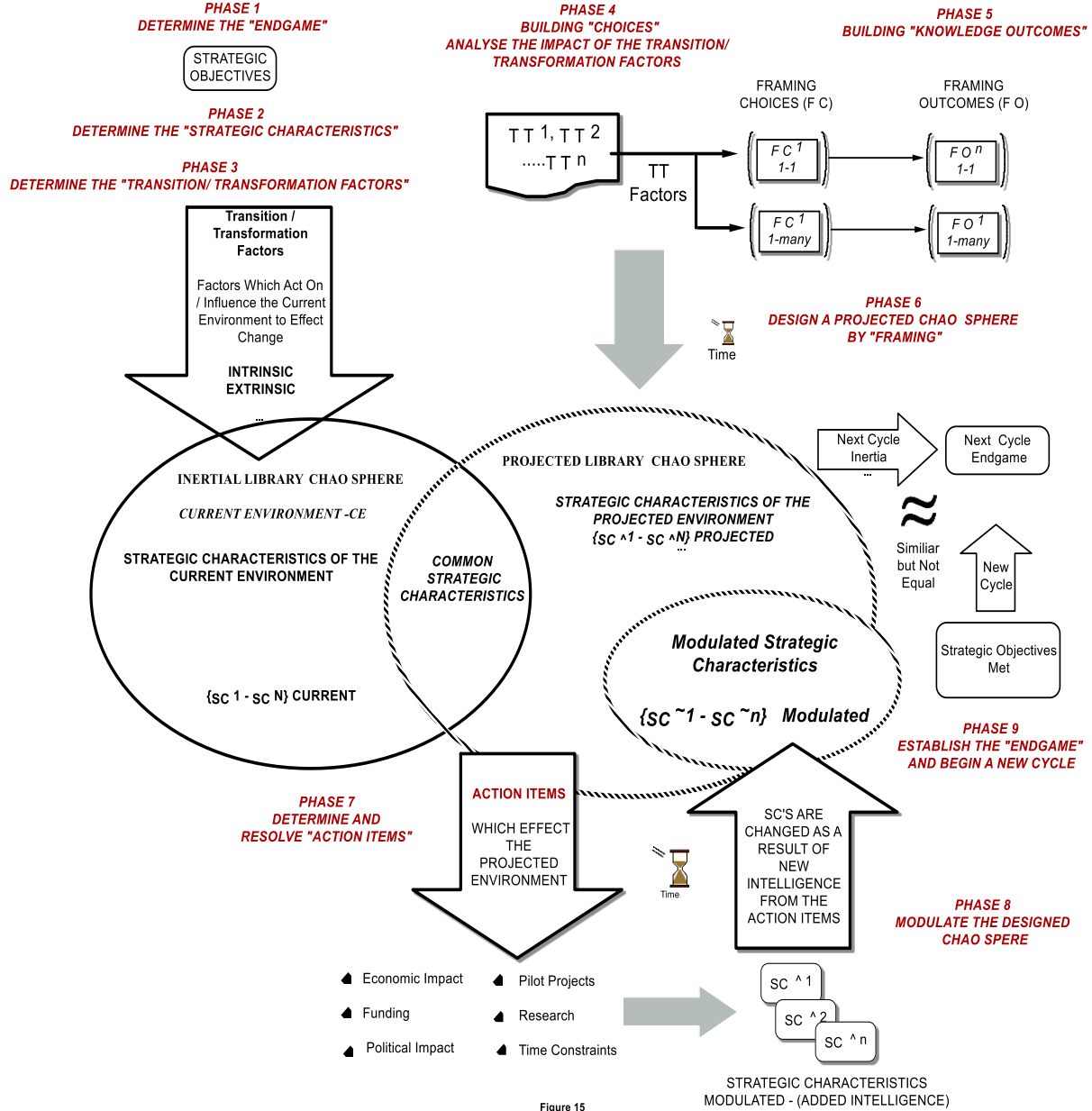


Figure 15
Chao Sphere Model

² Appendix A - Strategic Chaos Sphere Process Model Final Diagram

² Kenneth G. Wilkins. (2012)

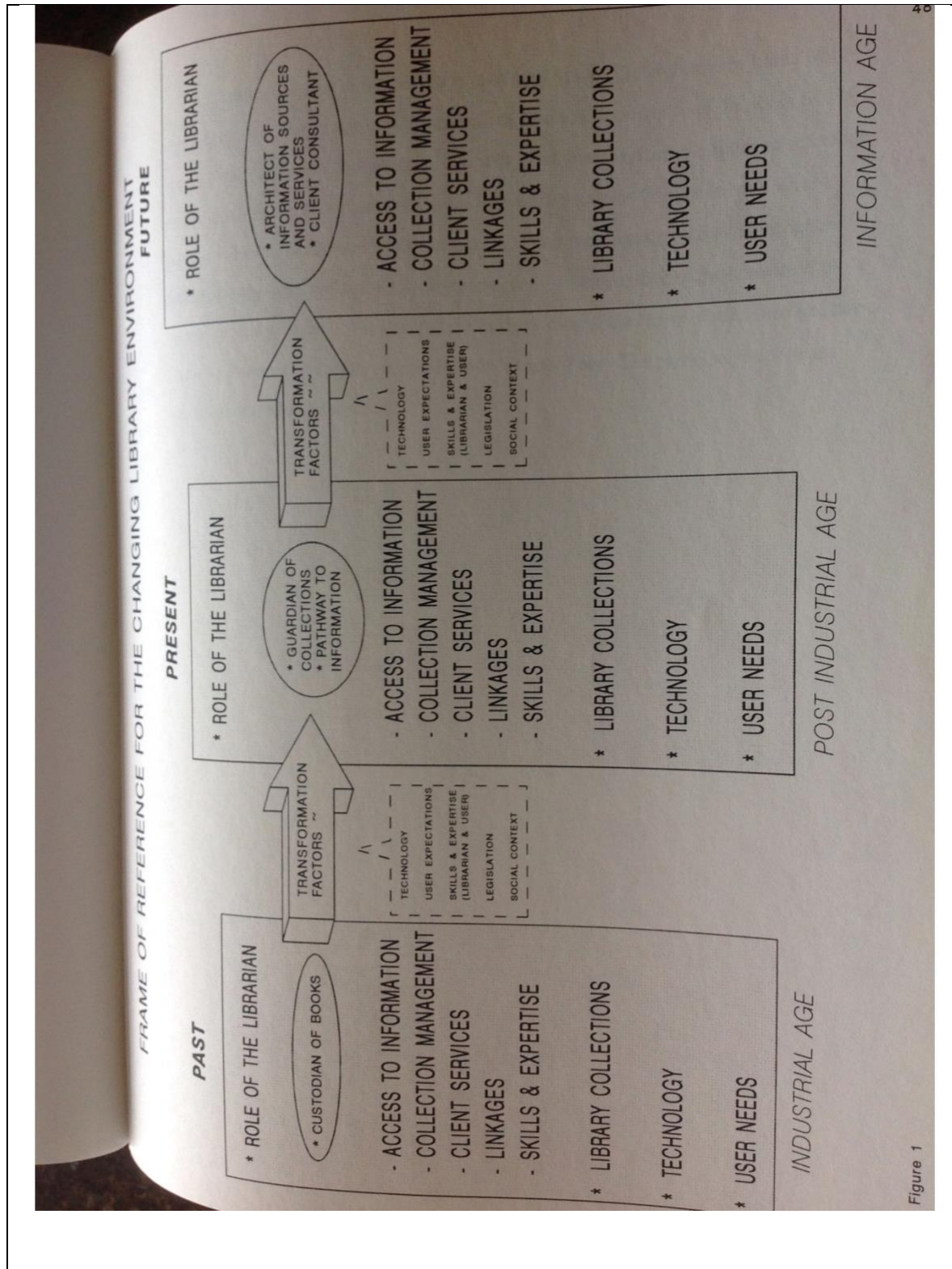


Figure 1

³ Framework for the Changing Library Environment

³ Wilkins 1995



⁴ *Ocean Wave*, (1988), acrylic on canvas. McIntosh Gallery Collection, Western University. Gift of Jacqueline Brien, 1994

⁴ Hodgson, Thomas Sherwood. (Canadian 1924-2006).

List of Illustrations

Figure 1: Wilkins, Catherine. (2018) Chaos Strategic Planning Process

Figure 2: Wilkins, Kenneth. (2012) *Strategic Chaos Sphere Process Model*

Figure 3: Wilkins, Catherine. (1995) *Framework for the Changing Library Environment Figure 1. p. 48. The Changing Library Environment*. Toronto: University of Toronto Thesis Graduate Department of Education.

Figure 4: Hodgson, Thomas Sherwood. (Canadian 1924-2006). *Ocean Wave*, (1988), acrylic on canvas. McIntosh Gallery Collection, Western University. Gift of Jacqueline Brien, 1994