Complexity Theory and Project Management

Wanda Curlee and Robert L. Gordon

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Preface

Organizations and projects are changing...

There is at present a great deal of interest in understanding projects in terms of complexity theory, self organization and emergence. The image of project manager's surfing on the edge of chaos is prevalent in practitioner conferences. I've used it myself to talk about the changing requirements for education for advanced project managers. As we acknowledge that projects are less structured and linear than we would like, we must realize that today's methods may not work on tomorrow's projects.

There is also increasing pressures to work in globally networked teams. When you can't see, touch, or have a beer with your teammate, how do you develop the trusting relationships necessary to deliver exceptional team results?

The people making up project teams (collocated or virtual) are more diverse—multi cultural, multi generational, multi skilled. Younger workers with possibly lower concentration spans and much higher aptitude and inclination to use technology intermingle with older workers used to set processes and procedures. "New" Americans and foreign colleagues work on projects with "old" multi cultural residents. All of these demographic changes are sure to influence how we work on projects. But how?

These are the challenges that academics around the world have been interested in for years. These are also the challenges that PMI's Research Membership Advisory Group is charged with encouraging research on. Almost 10 years ago when I was sitting on this committee I met a steely eyed woman by the name of Wanda Curlee. It quickly became clear that this woman both defied categorization having practised project management as a consultant and inside organizations and holding a doctorate degree in organizational leadership, and was as passionately intrigued by these challenges as anyone I have ever met. One of the good things about this committee is that it requires you to meet several times a year in exotic locations (well sometimes exotic) and after the business of the meetings, this group gets a chance to talk through the problems and challenges of managing projects in an ever changing world – and in particular of bringing research to bear on practice. I have had the privilege of many such conversations with Wanda over the years.

These are also the challenges that Drs Wanda Curlee and Robert Gordon tackle in this book. More than that, they integrate discussions of complexity with understanding of current project management standards and weave a set of tools and tips together to help the practicing project manager understand how these trends are likely to impact his/her practise. They provide relevant case examples and suggest practical tools and techniques. They bring to bear both the art and science of project management to explore projects as complex, emergent systems in this timely book.

Organizations the world over are grappling with the ideas and challenges discussed in this book. Just this week I personally spoke to the CIO of a major educational institution, the PMO of a small, 3B$ oil and gas company, and the person responsible for project management development at one of the world's largest consulting companies. All of these individuals were looking for guidance on how to develop organizational and individual project management competency to ensure that they get value for dollars invested in project management. They call me to hear what practical insights we learned from studying 65 organizations all around the world. All three of these organizations are dealing with situations where complexity and chaos are much closer to reality than linear, planned project execution. Ideas from these pages could help them today, and you tomorrow.

I encourage all experienced students of project management to read this book and apply as many ideas from it to your practise as you can. Come on in, the waters fine and surfing is a skill we all need to develop.

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Acknowledgments

This project started years ago with an idea that was bantered around in project management circles. It was not an easy project to define nor was it one that was easily researched. The material that directly related to the use of complexity theory and project management was sparse and in many cases it required searching for information that might not have been called complexity theory but was exactly that. In a few instances authors might credit chaos theory, but most of the time it required sifting through the body of knowledge of successful projects and organizations and then delve into the material to see if it met the criteria of complexity.

Just like the idea of this book first started as an idea in project management circles, the writing of every great work starts as an idea that slowly grows up until it takes on a life of its own. This book is the union between project management and complexity theory. The marriage of those two bodies of knowledge was not a simple task, and in the end the book required a team of individuals who were willing to contribute a part of each of them in order to achieve the work that is before you.

There is a saying that claims that it takes a tribe to raise a child. In this case, this saying is absolutely correct, as the child in question is the book that is before you. And the tribe is the loose confederation of people that all put their time, sweat and tears to get this project completed.

We would first like to acknowledge the tribe of photographers that helped bring this book to life. Spencer Ludgate, Nicole Burdsall, and Helle Girey all contributed pictures that helped bring home some of the ideas and concepts of complexity. Each of them brought pictures from the desert, to the ocean, and all the way from Africa, these illustrations helped offer representations of complexity that are seen in the natural world around us.

Second, there was the tribe of individuals that assisted with editing and indexing of this book. Our primary initial editor was Roseann Kruger. We would like to offer special thanks for her efforts to read every page of this book aloud in order to catch our errors, omissions and mistakes. It must be noted that the entire time that she was assisting us with this book; she was undergoing treatment for cancer. We are eternally grateful for her determination to see the project through and for her uncompromising assistance when it was needed most. We also want to offer our heartfelt thanks to Cassandra Corl for her assistance with the indexing of this book. She assisted on short notice and just as fast as a rainbow comes and goes, she was there to get the job done.

Both of our family tribes spent many hours wondering why we continued to spend days on the computer, instead of precious family time with them. We thank our families for being patient, understanding, and most of all for the encouragement to continue. Our time of adding to family complexity has quieted, we now acquiesce to others.

We would also like to thank that team at Wiley, all of whom were as professional as they come; whose efforts and feedback made this book a reality. The communication, support from the group at Wiley made certain that this book would be the best in the field of complexity and project management. In the end, it is clear that a tribe built this book and there is no doubt that the work of a community that makes a difference in society.

All the best,
Wanda Curlee & Robert Gordon

Introduction

Complexity theory is based upon the management belief that total order does not allow for enough flexibility to address every possible human interaction or situation. The problem is that people are inherently skeptical of less order and flexibility because there appears to be less control. A recent example of the working of complexity theory can be seen in the investigation of air traffic controllers after the 9-11 tragedy. Once it was determined that terrorists were using airplanes to attack buildings in the United States, it became a matter of national security to have every plane in the airspace of the United States land at the nearest airport. There was no procedure or process in place to allow this to happen.

Researchers were interested to see if a procedure or process could be developed to address such a widespread domestic crisis. The researchers studied the data and examined how each set of air traffic controllers managed the situation. In the end, the study concluded that the best way to handle such a crisis would be to allow each region to dynamically manage the situation. In other words, the creation of a procedure or process to handle such a situation would encumber the process and slow down the ultimate goal. This was a massive eye-opener for project managers everywhere because it was the first time that there was a multi-location study for a single industry whose results were not the creation of a linear solution to what would be considered a linear problem. It should also have been an awakening for project managers because it brought to light the inherent flaw in the underlying assumption that there is always one right solution or procedure to a problem.

For management theorists, this was a win for complexity theory because it showed that a complicated and complex project can be more successful utilizing complexity theory rather than looking for the single management solution to a seemingly linear problem. Complexity theory is a new, untapped reservoir of potential in the management field. Experts agree that complexity theory can apply to complex, virtual projects;

however, there is little material that would help the practicing project manager. Complexity theory has become a recognized area of project management and the *Project Management Body of Knowledge (PMBOK®)* Guide should address this area in the future. Complexity theory can be successfully applied to a complex, virtual project and so should become part of the *PMBOK Guide®*.

There is no handbook of practical and successful strategies that applies complexity theory to projects. Given the rate of failure of projects when

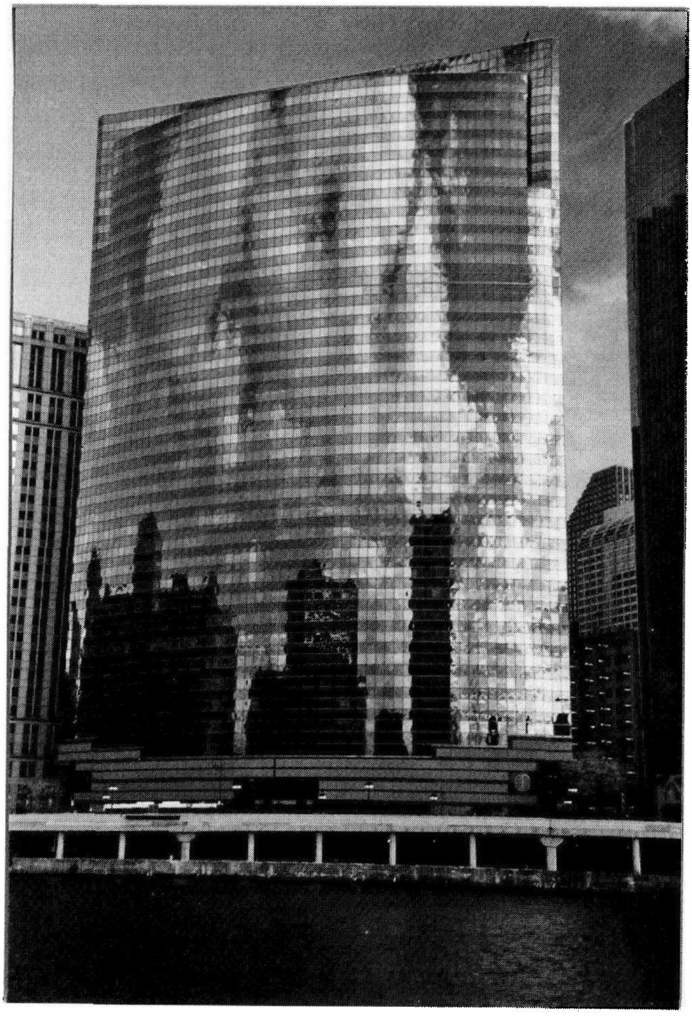

Figure I.1 Notice how the clouds reflect upon the building but not upon the sky. This is an example of how everyday images might offer a different and complex perspective.

compared to timeline and budget, it would be extremely valuable to offer practical complexity strategies that a project manager can deploy in order to improve his or her success rate.

Specifically, this book is broken down into five major sections. Part I outlines the theory of complexity and addresses current deficiencies in the existing body of knowledge about project management, and introduces ways that complexity can address these deficiencies. Part II addresses successful strategies that deploy complexity theory in order to make projects more successful. Part III presents case studies and details regarding how complexity theory has been applied successfully in other organizations. Part IV offers building blocks for project managers on how to create communities within their organization to support complexity theory. Part V reviews and summarizes the findings and reviews the future of the application of complexity theory. Complexity will continue to grow in importance in the project management field as more organizations understand how to apply these ideas to projects. Ultimately, the goal of any book on project management should be to improve the field of project management. Hopefully the knowledge set forth in this book will help project managers worldwide to become more productive and successful while maintaining their sanity.

Contents