A Model Thinking Primer:

How to See the Big Picture

A Model Thinking Primer: an Introduction to Thinking in Models

How To See The Big Picture

Greg Cupal

This book is for sale at http://leanpub.com/modelthinkingprimer

This version was published on 2023-07-09

This is a Leanpub book. Leanpub empowers authors and publishers with the Lean Publishing process. Lean Publishing is the act of publishing an in-progress ebook using lightweight tools and many iterations to get reader feedback, pivot until you have the right book and build traction once you do.

Tweet This Book!

Please help Greg Cupal by spreading the word about this book on Twitter!

The suggested hashtag for this book is #ModelThinkingPrimer.

Find out what other people are saying about the book by clicking on this link to search for this hashtag on Twitter:

#ModelThinkingPrimer

Also By **Greg Cupal**

Systems Thinking: Observing System Behavior

How to Learn: On the Job, In a Team

Contents

CONTENTS

The Big Picture

Minimum Viable Product

Writing this book is challenging. It is an exercise in Loop/Experiential Learning. This information came from career experiences that proved to be helpful. After observing a surprising business outcome, I searched for an explanation for the sequence of events. Learning a relevant theory allowed me to apply that knowledge in this and later situations.

There is so much helpful information it is difficult to limit what should be in the book. I added these Minimum Viable Product sections to significant chapters to document the minimum content expected for that chapter. This is not a warranty or guarantee that any information will be included in the final version. If you are familiar with iterative development approaches, you will understand this technique.

Preface

The world is a messy place. You can gain a competitive advantage over other employees if you can be just a little less messy. Investing in "a little less messy" has exponential benefits that are worthy of your efforts. As messy as this book may be, the benefits of understanding this information will be huge. "Mess" is a systems thinking term coined by one of the famous thinkers in systems: Russell L. Ackoff.

> "Every problem interacts with other problems and is, therefore, part of a set of interrelated problems, a system of problems.... I choose to call such a system a mess."
> —Russell L. Ackoff

Dealing with messes and solving problems taught me three career skills. These led to higher wages, better strategic insights, and the ear of choice executives:

1. Understand the whole problem, which led me to Model Thinking.
2. Learn from your mistakes, which led me to Loop-Learning.
3. Dancing with Chaos, which led me to understand the levels of complexity.

Fixing a problem upstream could create problems downstream was the warning in the certification training materials. They suggested the wise practitioner would observe the whole process and look for potential problems before changing any part of the process.

To observe the whole process, a practitioner would need to map out the tasks. The best approach for that was the Value Stream

Analysis and mapping: Model Thinking. Once you made a change, you needed to observe the whole value stream, validate the change worked, and verify it did not introduce errors. If another error did occur, the person could correct it using what they learned, instead of applying whack-a-mole fixes until the process worked again. The wise practitioner would: reflect on the error, review the value stream, talk to the team, and then propose a solution before attempting a new fix. Otherwise, known as Loop Learning.

> Relative success would follow the practitioner that observed, mapped/modeled, validated the model, then reflected on what they did to correct the process.

This is an example of real-life experience applied in actual situations. This make-a-model, observe-a-model technique opened my eyes to the effects of social networks in the workplace. The fault lines in a corporate culture popped out like the yellow and white lines on a highway. It highlighted the need for employees aligned to a common goal. This "dancing with chaos" led to a deeper understanding of Systems Thinking and Complexity.

Model Thinking (MT) is a technique to structure your thoughts about people and things and how they interact. Systems Thinking is a specialized form of model thinking that helps you deal with the messier messes. Complexity Thinking/Theory deals with the really messy stuff. This book will cover all of that mess at an introductory level.

> You can profit immensely if you can be a little less messy.

Why do I continue to use an unprofessional term like "mess"? The domain of knowledge in this book is normally heavily in philosophy. This topic can spiral out of control into a deep debate about the nature of reality. To join in that conversation requires

academic rigor that causes people, the average person, to run for the hills. So, the book will present a messy overview of the topic; one that I gained from practical experience. In addition, it will point you toward additional resources so you can continue your journey on this path.

People ask you to see "the big picture", but never suggest how. Hence, that is the goal of this book. "Seeing" the big picture is problematic. First, no one lives their life looking through one myopic picture frame. They see the whole world around them. Second, people don't see a picture, they see video—things in motion. They see everything together as one continuous experience. Last, the video is a small window on the world that is forced within a picture frame.

Have you seen a picture of the blurry thumb? Unfortunately, it has little information and little detail. What about a picture of someone pointing enthusiastically at something outside the picture frame? That has plenty of detail but is missing information. Then again, what about a picture of the Earth taken from the moon? That has all Earth's information, but none of the detail. Alas, there is a trick to seeing the big picture, but it is relativity easy to learn.

Imagine a professional photographer. They hire a bunch of models for a shoot. The models are "real", but they represent an "imagined" reality. They exist to help the photographer visualize a situation. The best way to learn about the big picture is to think in models. Not the glamorous, high fashion type model—but a collection of people, things, and their interactions. Imagine a photographer creating a photo: they collect the items and people on a set, then ask them to interact as they snap pictures. Our "big picture" is a model composed of items, people, and their interactions.

I organized this book into two sections: three skills and a deeper understanding of chaos. The first section starts with the three primary skills: Model Thinking, Loop Learning, and Levels of Chaos/Complexity. Starting with elementary modeling, we will

move to *learning by using models*. The first section ends with an overview of the levels of complexity. The limited definition (people, items, interactions) from the first section is insufficient for your work. So, we will explore Systems Thinking as a tool to build more powerful models. Alas, Systems Thinking will eventually fail at modeling complex situations. For that reason, we will finish with Complexity Theory.

Get the picture?

Thinking in Models

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Model Thinking

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

What is a Model?

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Models as Descriptions

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Models as Stories

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

The "Dinner" Model

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

The Dinner Party Model

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Dinner Out

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Take-Out or Take-Away

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Multiple Mental Models

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

In Summary

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Parts of a Model

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

People or Things

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

People

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Things

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Other Stuff

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Interactions

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Perspective

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Time and Place

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Time and Availability

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Time

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Delay:

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Start Time/Future Time

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

End Time

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Duration

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Window of Opportunity:

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Summary

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

The World as a Relay Race

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

A Simple Relay

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

People

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

things

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Interactions in race

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

A More Realistic Race

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

People

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Things

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Interactions

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Things Get Complicated

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

People

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/ modelthinkingprimer.

Things

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/ modelthinkingprimer.

Interactions

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/ modelthinkingprimer.

It's About Time (and Availability)

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/ modelthinkingprimer.

The Odd Relay Race

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/ modelthinkingprimer.

Revisit

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Loop Learning

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Loop Learning Introduction

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

The Loop Learning Cycle

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Single/Double/Triple Loop Learning

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Summary

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Improved Loop Learning Cycle

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/ modelthinkingprimer.

Examples

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/ modelthinkingprimer.

The Scientific Method

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/ modelthinkingprimer.

The OODA Loop

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/ modelthinkingprimer.

TBD

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/ modelthinkingprimer.

The PDCA Cycle

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/ modelthinkingprimer.

TBD

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Scrum

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

TBD

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Summary

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Levels of Chaos

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

MVP—Levels of Chaos

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Inspiration for the book

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Working on a Problem

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Thinking in Systems

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Systems Thinking

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Introduction

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

The Basics Of Systems

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Elements, Interactions, Function

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Elements: It's What's Related

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Interactions, Interconnections, Relationships

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Interconnections

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Interconnections in the Relay Race Model

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Relationships

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Relationships in the Relay Race Model

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Interactivity

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Interactivity in the Relay Race Model

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Function or Purpose

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Perspective

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

More about Systems

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Function as Behavior

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Behavior

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Emergent Behavior

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Feedback

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Boundaries

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Cohesion

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Bounded Rationality

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/ modelthinkingprimer.

Open or Closed System

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/ modelthinkingprimer.

TBD

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/ modelthinkingprimer.

The Relationships

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/ modelthinkingprimer.

TBD

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/ modelthinkingprimer.

Behavior and Function

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

TBD

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Function and Boundaries

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

TBD

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Boundaries and Behavior: Sub-systems

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

TBD

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Boundaries and Sub-systems

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/ modelthinkingprimer.

TBD

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/ modelthinkingprimer.

Behavior and Sub-systems

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/ modelthinkingprimer.

TBD

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/ modelthinkingprimer.

Behavior Dive Deeper

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/ modelthinkingprimer.

Coupling

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/

modelthinkingprimer.

TBD

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/ modelthinkingprimer.

The Iceberg

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/ modelthinkingprimer.

TBD

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/ modelthinkingprimer.

Events

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/ modelthinkingprimer.

TBD

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/ modelthinkingprimer.

Patterns of Behavior

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/ modelthinkingprimer.

TBD

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/ modelthinkingprimer.

System Structure

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/ modelthinkingprimer.

TBD

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/ modelthinkingprimer.

Organization Structure

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/ modelthinkingprimer.

TBD

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/ modelthinkingprimer.

Mental Models

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Complexity Thinking

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

The World of Can and Can't

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

MVP - Greg's Can and Can't

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

MVP - Marletto's Can and Can't

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Counterfactual

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

MVP - Constructor Theory

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/ modelthinkingprimer.

The Traditional Conception of Physics

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/ modelthinkingprimer.

Introduction to Options and Consequences

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/ modelthinkingprimer.

Science: the Prevailing Conception of Physics

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/ modelthinkingprimer.

Causality-Causation: Making Things Happen

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Counterfactuals: The Land of Neverwas

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

Complexity

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

MVP - Complexity

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.

TBD

This content is not available in the sample book. The book can be purchased on Leanpub at http://leanpub.com/modelthinkingprimer.