



Artful Making: What Managers Need to Know About How Artists Work

By Robert Austin, Lee Devin

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Artful Making offers the first proven, research-based framework for engineering ingenuity and innovation. This book is the result of a multi-year collaboration between Harvard Business School professor Robert Austin and leading theatre director and playwright Lee Devin. Together, they demonstrate striking structural similarities between theatre artistry and production and today's business projects--and show how collaborative artists have mastered the art of delivering innovation "on cue," on immovable deadlines and budgets. These methods are neither mysterious nor flaky: they are rigorous, precise, and--with this book's help--absolutely learnable and reproducible. They rely on cheap and rapid iteration rather than on intensive up-front planning, and with the help of today's enabling technologies, they can be applied in virtually any environment with knowledge-based outputs. Moreover, they provide an overarching framework for leveraging the full benefits of today's leading techniques for promoting flexibility and innovation, from agile development to real options.

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Editorial Review

From the Back Cover

Managing When You Don't Know Where You're Going

If you don't know where you're going, any map will do. This conventional wisdom sounds right to many managers. It highlights the safety of having a clear objective for your management actions. It implies that all management actions are likely to be confused and inefficient if you don't have a clear objective. If you don't have a good fix on your destination--be it a product or service, a strategic or competitive outcome, or anything else--you may as well not start the journey.

For a lot of your work, though, this so-called wisdom is wrong. Why? For one thing, you can't always know your destination in advance. Whether you're designing a new product, running a business in volatile conditions, operating a process that might encounter unforeseen inputs, or just trying to figure out what to do with your life, the journey usually involves exploration, adjustment, and improvisation. Situations in which you don't or can't know the results in advance are common and consequential. All businesses face them.

If you're not too narrow in what you're willing to call "management," you can manage these situations. You can enhance effectiveness and efficiency, and you can improve the likelihood of valuable outcomes. However, the methods you'll use will differ from, and sometimes conflict with, methods that work when you do know where you're going.

There is an increasingly important category of work--knowledge work--that you can best manage by not enforcing a detailed, in-advance set of objectives, even if you could. Often in this kind of work, time spent planning what you want to do will be better spent actually doing (or letting others in your charge do), trying something you haven't thought out in detail so you can quickly incorporate what you learn from the experience in the next attempt. In appropriate conditions--only inappropriate conditions--you can gain more value from experience than from up-front analysis. In certain kinds of work, even if you can figure out where you're going and find a map to get you there, that may not be the best thing to do.

Forging ahead without detailed specifications to guide you obviously requires innovation, new actions. We take this observation one step further by suggesting that knowledge work, which adds value in large part because of its capacity for innovation, can and often should be structured as artists structure their work. Managers should look to collaborative artists rather than to more traditional management models if they want to create economic value in this new century.

We call this approach artful making. "Artful," because it derives from the theory and practice of collaborative art and requires an artist-like attitude from managers and team members. "Making," because it requires that you conceive of your work as altering or combining materials into a form, for a purpose. Materials thus treated become something new, something they would not become without the intervention of a maker.

About the Author

Rob Austin is Professor of Technology and Operations Management at Harvard Business School where his

research focuses on the changing nature of work. His experience includes a decade with Ford Motor Company; from 2000 to 2001, while on leave from Harvard, he served as a senior executive for a new division of a leading technology company, helping to establish a new organization and technology platform. He is author of *Measuring and Managing Performance in Organizations*, and co-author of *Creating Business Advantage in the Information Age*, and *Corporate Information Strategy and Management*. A Cutter Technology Council Fellow, Dr. Austin holds a Ph.D. from Carnegie Mellon.

Lee Devin, Professor Emeritus at Swarthmore College and dramaturg for the People's Light and Theatre Company, has more than 30 years of experience in the theater. He has won prizes and grants for play scripts, librettos, and translations that have been published or performed worldwide. As an Equity actor, his roles have ranged from Malvolio in *Twelfth Night* to Mitch in *A Streetcar Named Desire*. He has been a visiting consultant or artist in residence at Columbia University, the Folger Library, Ball State University, the Banff School of the Arts, University of California San Diego, Bucknell University, and the Minnesota Opera. Dr. Devin holds a Ph.D. from Indiana University.

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Introduction

Managing When You Don't Know Where You're Going

If you don't know where you're going, any map will do.¹ This conventional wisdom sounds right to many managers. It highlights the safety of having a clear objective for your management actions. It implies that all management actions are likely to be confused and inefficient if you don't have a clear objective. If you don't have a good fix on your destination—be it a product or service, a strategic or competitive outcome, or anything else—you may as well not start the journey.

For a lot of your work, though, this so-called wisdom is wrong. Why? For one thing, you can't always know your destination in advance. Whether you're designing a new product, running a business in volatile conditions, operating a process that might encounter unforeseen inputs, or just trying to figure out what to do with your life, the journey usually involves exploration, adjustment, and improvisation. Situations in which you don't or can't know the results in advance are common and consequential. All businesses face them.

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We call this approach artful making. “Artful,” because it derives from the theory and practice of collaborative art and requires an artist-like attitude from managers and team members. “Making,” because it requires that you conceive of your work as altering or combining materials into a form, for a purpose.² Materials thus treated become something new, something they would not become without the intervention of a maker. This definition usually points to work that changes physical materials, iron ore and charcoal into steel, for instance. But the work and management we’re considering don’t always do that. Instead they mostly operate in imagination, in the realm of knowledge and ideas. While artful making improves any thing that exhibits interdependency among its parts, we’re not primarily concerned with heating metal and beating it into shapes. We’re more concerned with strategies, product designs, or software—new things that groups create by thinking, talking, and collaborating.

Artful Making

Any activity that involves creating something entirely new requires artful making. Whenever you have no blueprint to tell you in detail what to do, you must work artfully. A successful response to an unexpected move by a competitor requires artful activity; so does handling a sudden problem caused by a supplier. An artful manager operates without the safety net of a detailed specification, guiding a team or organization when no one knows exactly where it’s going.

In the 21st Century, it’s a simple fact that you often don’t know where you’re going when you start a journey. A manager who needs to be handed a clear set of objectives or a process specification is only half a manager (and not the most important half). To know where you’re going by the time you start, that’s an amazing luxury and you probably can’t afford it. Anyway, if you think you know where you’re going, you’re probably wrong. The need to innovate, to make midcourse corrections, and to adapt to changing conditions are the main features of a growing part of daily work.

Many people in business admit that parts of their work are “more art than science.” What they often mean, alas, is that they don’t understand those parts. “Art” used in a business context usually refers to something done by “talented” or “creative” people who are not quite trustworthy, who do work that resists reasonable description. There’s often a disparaging implication that art-like processes are immature, that they have not yet evolved to incorporate the obviously superior methods of science. The premise that underlies this point of view equates progress with the development of reliable, rules-based procedures to replace flaky, unreliable, art-based processes. We reject this premise.

Our close examination of art-based processes shows that they’re understandable and reliable, capable of sophisticated innovation at levels many “scientific” business processes can’t achieve. A theatre company, for instance, consistently delivers a valuable, innovative product under the pressure of a very firm deadline (opening night, eight o’clock curtain). The product, a play, executes again and again with great precision, incorporating significant innovations every time, but finishing within 30 seconds of the same length every time. And although art-based processes realize the full capabilities of talented workers and can benefit from great worker talent, by no means do they require exceptional or especially creative individuals. Nor does great individual talent ensure a valuable outcome. A company of exceptionally talented big stars can (and often will) create a less effective play than one made up of ordinarily talented artists who have, through hard work, learned how to collaborate. Business history too provides numerous examples of underdog upstarts out-collaborating and out-executing companies with much better resources; and few (if any) companies have ever worshiped more devoutly at the altar of raw individual talent than Enron, one of the most spectacular corporate failures in history.³

As we will show, underlying structural similarities in costs make theatre rehearsal and other collaborative art processes better models for knowledge work than more rules-based, scientific processes. The key to understanding these similarities is something we call cheap and rapid iteration.

How Cheap and Rapid Iteration Changes Everything

The cost of iteration—the cost of reconfiguring a process and then running it again—significantly impacts the way we work. Reconfiguring an auto assembly process can involve buying and installing new equipment, which can be pretty expensive. So, automakers usually do a lot of planning before they commit to a configuration. They don't want to have to reconfigure very often. They try to "Get it right the first time."

On the other hand, some software development processes are designed nowadays so that they can be reconfigured cheaply and quickly. Developers generate new versions of a software system as often as needed. Technologies that allow new versions to be rebuilt easily keep the cost of iteration low. When enabling technologies help keep the cost of iteration low, we don't need to worry as much about getting it right the first time. Instead, we can try things, learn from them, then reconfigure and try again. Because it doesn't cost much to iterate, the value of doing is greater than the value of thinking about how to do. Cheap and rapid iteration allows us to substitute experience for planning. Rather than "Get it right the first time," our battle cry becomes "Make it great before the deadline."

Management researchers often talk about cheap and rapid iteration as cheap and rapid experimentation. The ability to run experiments cheaply and quickly is an important benefit when the cost of iteration is low. Simulation technologies, for example, allow automakers to run virtual crash-testing experiments to determine the safety implications of many car body structures, more than they could afford to test with actual cars.⁴ But experimentation, though important, is only part of what is achieved by cheap and rapid iteration. If you think and talk about iteration as experimentation, low cost of iteration seems to make business more like science. Its broader effect, though, is to make business more like art.

Here's why: Before you can crash test virtual cars, you must create virtual cars. Cheap and rapid iteration lets you test cars more cheaply, but it also lets you create them more cheaply, and in many more forms. The creation of things to test—in scientific terms, the generation of hypotheses—is a fundamentally creative act. In many business situations, the hypothesis, problem, or opportunity is not well-defined, nor does it present itself tidily formed; you must therefore create it. Even when a problem or opportunity appears well-defined, often you can benefit from conceiving it in a new form. The form you conceive for it—the idea of it you have—will determine how (and how well) you solve it. Cheap and rapid experimentation lets you try new forms; cheap and rapid artful iteration helps you create new forms to try.

Artful making (which includes agile software development, theatre rehearsal, some business strategy creation, and much of other knowledge work) is a process for creating form out of disorganized materials. Collaborating artists, using the human brain as their principal technology and ideas as their principal material, work with a very low cost of iteration. They try something and then try it again a different way, constantly reconceiving ambiguous circumstances and variable materials into coherent and valuable outputs.

Artful making differs from what we call industrial making, which emphasizes the importance of detailed planning, as well as tightly specified objectives, processes, and products. Its principles are familiar: Pull apart planning and production to specialize each; create a blueprint or specification, then conform to it; don't do anything before you know you can do everything; "Get it right the first time." When industrial makers conform to plans and specifications, they say their products and processes have "quality." The principles of industrial making are so embedded in business thinking that they're transparent and we don't notice them. We

apply them reflexively; they are “The way we do things.” But, as we shall see, industrial methods can distort reality and smother innovation. Artful and industrial making are distinct approaches and each must be applied in the appropriate conditions.

It's important to recognize that artful and industrial making are not mutually exclusive. Artful making doesn't replace industrial making. Artful making should not be applied everywhere, nor should industrial making. They complement each other and often can be used in combination. Complementary doesn't mean interchangeable, though. As opportunities for artful making multiply with the expansion of the knowledge sector of business, managers and other workers must be careful not to attempt to solve artistic problems with industrial methods, and vice versa.

The History and Origins of this Book

The collaboration that led to this book began with a telephone call in 1998. Rob (a business professor) asked Lee (a theatre professor) to repeat a story he'd told when Rob was his student at Swarthmore in the early 1980s. The story was about different ways of controlling human action. When he called, Rob was trying to understand why control mechanisms that work well for physical activities seem to work less well for knowledge work. Lee recognized some of the issues from conversations with his son, Sean (then an engineer/manager at Allied Signal); they had been casually wondering how to apply principles of theatre improvisation to the reluctance of engineers to look beyond the back of the book for solutions to new problems. A subsequent series of increasingly energetic conversations between Rob and Lee turned to broader issues of how highly skilled people engaged in creative activities might be managed (or “directed,” as Lee put it).

We were surprised to discover common patterns and structures in our separate domains. Rob talked about software development; Lee talked about play making. But the issues sounded oddly, and increasingly, similar. Some recent ideas and methods in software development, especially in the so-called “agile” community, seemed almost identical to theatre methods. As this became more obvious, an idea dawned on business professor Rob: These artists are much better at this than we are. Managers and management students don't understand how to create on cue, how to innovate reliably on a deadline, something theatre companies do all the time.

We quickly noticed something else. As Rob tried to understand how theatre ensembles innovate in rehearsal, he kept missing the point; or so it seemed to Lee. Now, missing the point isn't an entirely new experience for Rob, but there was more to this problem than intellectual density. As Rob listened and tried to repeat back what he heard, Lee and the artists at the People's Light and Theatre Company gradually took on an aspect of polite rather than interested attention. Eyes glazed and conversation grew desultory. Rob's management language didn't accommodate the theatre's idea of work. An example will help illustrate what we mean.

Early in this research, thinking about cheap and rapid iteration as a way of working, we found ourselves talking about “failure.” Rob observed that an iterative work cycle must include many failures on the way to success. Lee agreed, but resisted the term “failure.” Failure isn't the right idea. In rehearsal, the iterations all interact with each other. The current run-through provides the main material for the next run-through. Each trial is a necessary step on the way to what's good and essential to the final success. To call an essential step towards success a failure merely tortures language. What's more, the word “failure” applied to routine work could poison the growth of Ensemble, a quality of group work essential to rehearsal, and to artful making. “Fair enough,” thought Rob, “use some other word,” though it seemed at the time like a minor technical point.

Then we got to thinking about IDEO, a leading product design firm that employs an iterative approach, and

failure came up again.⁵We agreed that IDEO's work process was an artful one, but they talk about failure all the time, saying things like, "Fail often to succeed sooner." When professors at the Harvard Business School (HBS) use IDEO as an example, it's customary to note the difference between a "failure" and a "mistake." In the HBS view, IDEO cherishes failure because it generates new information. But a failure that doesn't generate useful new information is called a mistake. Touch a hot stove and burn your hand—that's a failure; touch it again and burn your hand again—that's a mistake—same injury, no new information.

This resonates with many Master of Business Administration (MBA) students and even executives, but makes no sense to artists. The distinction between failure and mistake imposes an unreasonable limit on exploration. Though artful making is, as we have said, reliable and efficient, it has little use for the efficiency of rules like "Avoid touching a hot stove twice." Touching the stove twice (or ten times) may be what's needed to break up a creative log jam. Just as an athlete may need to execute the same painful movements (lift the weight; run the interval) over and over on the way to new levels of performance, so you may need to make the same mistake many times on the way to an innovative leap. Burning your hand is a small price to pay for a good idea.

We concluded from these discussions that we had to be careful about the fit between artful making ideas and management thinking categories. Describing theatre practice in Rob's vocabulary, we risked missing the point.

How to Read This Book

For the above reasons, we resolved in our study to describe and understand theatre in some detail as a way to describe and understand a big change in the way we think about work. We'll rely on the persuasive power of an extended analogy to combine with your experience and spark new ways of thinking. Very little of what we discuss in this book is substantively new. Iterative product development processes, for instance, are well-documented in management literature. What's new here isn't the raw content, but the suggestion to use theatre art as a lens that can offer a new and productive view of familiar, but rapidly changing territory.

In the chapters that follow, we will provide evidence of our claim that some successful business processes are becoming more and more like art. We will also describe in detail the artful making framework, an enabling metaphor to replace more traditional industrial metaphors that control how we manage and do work. Early chapters will focus on explaining what we mean by artful making, and how it manifests in many different environments. Later chapters will illustrate how companies, both business and theatre, make artfully. In doing all this, we will sometimes take you quite deeply into the inner workings of artists in a theatre ensemble. As you read the "artsy" sections of this book, we encourage you to consider our extended analogy between theatre and business with an open mind. The analogy is not a perfect map in all respects, but it may contain useful insights, including some particular to your unique situation, unknown to us, that you must therefore discover for yourself.

Endnotes

1. ALICE: Would you tell me, please, which way I ought to go from here?

CHESHIRECAT: That depends a good deal on where you want to get to.

ALICE: I don't much care where—

CHESHIRECAT: Then it doesn't matter which way you go.

ALICE:—as long as I get somewhere.

CHESHIRECAT: Oh, you're sure to do that, if only you walk long enough.

Lewis Carroll, *Alice's Adventures in Wonderland; Through the Looking Glass* (New York: Collier Books, 1962) p. 82.

2. This formulation was conceived first by Aristotle about 2500 years ago. He applied it to unique products composed of interdependent parts: handmade, unique things, in other words. This way of looking at making fell out of favor as making more and more referred to vast numbers of things mass-produced.
3. See, for example, Malcolm Gladwell, "The Talent Myth," *The New Yorker* (July 22, 2002) pp. 26–33.
4. Michael Schrage has written about how simulation helps companies behave in ways that we would call artful. *Serious Play: How the World's Best Companies Simulate to Innovate* (Boston: Harvard Business School Press, 2000).
5. For more information on IDEO, see Tom Kelley's *The Art of Innovation: Lessons in Creativity from IDEO, America's Leading Design Firm* (New York: Random House, 2001). Or, for a shorter summary, see Stefan Thomke and Ashok Nimgade, "IDEO Product Development" (Harvard Business School case no. 600-143, 2000).

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