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# The New medium of print: Material communication in the internet age

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THE NEW MEDIUM  
OF PRINT

MATERIAL COMMUNICATION  
IN THE INTERNET AGE

FRANK COST



RIT CARY GRAPHIC ARTS PRESS  
ROCHESTER, NY

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# PREFACE

**B**EFORE PEOPLE USED MEDIA OF ANY KIND THERE WERE ONLY WORDS, spoken with inflection, emotion, expression; sometimes sung; sometimes accompanied by instrumental music and perhaps even dance; sometimes shouted at a distance. But beyond the limits of shouting, a messenger was needed to traverse the distance, carrying words in memory and repeating them upon arrival at an intended destination, and making contact with an intended audience.

Thousands of generations later humans finally learned how to speak across continents and oceans and across the whole world. The telephone, radio, and television made it possible for people to finally do what they had always wanted to do. But these powers were not gifts from the gods. They were inventions of science. And science would never have been possible had people not invented ways to encode language in physical and portable form.

If the telephone, radio, and television had been embedded in the aboriginal landscape, like stones or trees, there never would have been the need for written language. This undoubtedly would have led to other historical consequences. The sitcom, for example, would surely have run its course thousands of years ago. Today, we inhabit a world saturated with electronic communication channels of all kinds. Yet the oldest form of mediated communication, fixing words and pictures to physical objects and then transporting them to locations in space and time where they can be viewed directly, still plays a vital role. Print is everywhere around us, and yet so familiar that it remains nearly invisible.

During the past quarter century of teaching I have often

wished for a small, fun-to-read book to give to people who were thinking about the world of print for the first time. Most of the available introductory books concentrate heavily on the technology, but say little about how people actually use print, let alone why. Until very recently it has been easy to overlook these questions. Asking why people printed was like asking why they farmed, or why they drank water. What alternatives existed?

Today we are living in the second decade of the Internet era. The impact of the Internet on printing promises to be as profound as the discovery of an electronic alternative to food would be on farming—for the first time in our long history on planet Earth we would be forced to ask fundamental questions about the enduring value of physical nourishment. Where will electronic substitution be most pervasive? Under what circumstances does the physical form work better than the electronic alternative? Where might the value of physical forms actually increase in the context of widespread adoption of electronic forms? How might the infrastructure that enables electronic solutions be used to revolutionize the way physical solutions are created and delivered?

If you are encountering print as a subject of conscious study for the first time, this book provides an introduction to the underlying systems for the creation and distribution of print in Part One, and an exploration of the many and varied contemporary uses of print in Part Two. If you are already familiar with the technologies of print, you may want to skip Part One and begin your reading with Part Two. However you use this book, my hope is that you will come away from it with a better understanding of how Internet-enabled print media serve a great variety of present-day needs, and deeper insight into how they will be likely be used in the future.

Frank Cost  
Rochester, New York  
April 2005

# INTRODUCTION

**I**N 1998 I WAS INVITED TO MAKE A PRESENTATION on the future of print at a symposium in Barcelona celebrating the 500th anniversary of the founding of the printers' guild in that Mediterranean city. My presentation focused on the promise of the new generation of digital production color printing devices to enable new markets for custom-printed products that were not governed by the traditional economics of mass production. In 1998, the Internet had only been open for commercial activity for a few short years, few people were connected to it, broadband was something only large organizations could afford, and computers were still far too slow to process graphic information efficiently enough to make effective use of digital printing. But all of the ingredients necessary for a revolution in print communications were in place. All we had to do was to wait a few years for the computing power and network infrastructure to catch up with the promise.

In 1498, the year the Barcelona printing guild was founded, the Portuguese explorer Vasco da Gama sailed around the horn of Africa to open the first maritime trade route to India. Christopher Columbus had visited the new world for the first time only six years before. The new mechanical technology of printing was spreading throughout Europe, and was enabling a revolution in communications that empowered the written word and the people who commanded it.

The invention of printing opened a channel of communication between individuals and audiences that provided a mechanism for accelerating the evolution of mass culture. During the next half-mil-

lennium, the print medium served as a foundation for the construction of a global order that mirrored the architecture of the medium itself. Print provided one-way, one-to-many communication. This enabled a small number of people to broadcast messages to large populations. The first generation of print publishers used the technology exclusively to broadcast tried and tested biblical messages. By the end of the 15th century, publishers began to realize that the greater power of the medium lay in its ability to transmit new messages to large audiences.

The first new messages transmitted by print were political or social commentary, often disguised as allegorical literature to evade the censorship that was claimed as a divine right by the ruling classes. With the gradual assertion of the idea of natural rights that began in the early 18th century, print was used increasingly as a medium for direct political expression. The purpose of the expression was to influence the political behaviors of large groups of people.

It didn't take long for people to realize that if political behavior could be influenced by printed messages, why not commercial behavior as well? Thus was born print advertising. The first advertising piggybacked on existing print channels. These were established and cultivated by editorial content. They were then exploited by advertising. For the past two centuries the print medium has grown to comprise tens of thousands of publications targeting distinct audiences defined by common interests and values.

In the 20th century, print advertising was joined by radio and then by television. For a few decades from the 1930s through the 1960s, print, radio, and television were able to assemble huge national mass audiences for advertisers. A common picture of the typical American home of the mid 1950s contains the following required details: the television sat in the corner of the room tuned to one of the two networks; *Life* magazine sat on the coffee table; consumers sat on the couch believing that there were substantive differences between Oldsmobile and Ford, or Crest and Colgate. National advertisers used print, radio, and television channels to reach large mass audiences of undifferentiated consumers to exert influence over their commercial behavior.

Print had one clear advantage over television at the time. In addition to the mass consumer audience, print was able to target

a growing number of smaller special-interest markets. Television was not able to begin along this path until the cable revolution in the 1970s. By then, print had already defined hundreds of smaller audiences that advertisers could reach with more focused marketing messages.

Since 1970, the mass audience that was once such a rich target for mass advertising has become increasingly fragmented and diverse. Print has followed this trend by proliferating new titles that more effectively target emerging special interests. But there is trouble brewing across the whole spectrum of traditional print media. Circulations for all of the major consumer magazines have been falling for more than a decade. Daily metropolitan newspaper circulations have also been falling. More than 60 percent of the magazines offered for sale on newsstands are never sold.<sup>1</sup> The vast majority of printed catalogs and direct mail pieces end up in landfills without ever being read. If the Sierra Club and Greenpeace didn't rely almost exclusively on direct mail for their own fundraising efforts, the printing industry might find itself at the top of their lists of "corporate evil-doers."

The essential problem with the traditional print medium is that it supports only one-way communication. Because print first defined the audiences that became the markets for the products of industry, and because it continues to participate in the industrial economy as a mass-produced commodity, it is both parent and child of the Industrial Age. As such it shares all of the strengths and weaknesses of the industrial model.

Traditional manufacturing and distribution systems attempt to predict the size of future markets for products, and then produce and *push* the product into the marketplace. Automobiles, television sets, potato chips, and most printed products are mass-produced and distributed before they are offered for sale. If the manufacturers correctly predict the volume of sales and keep the distribution channel full enough to meet the demand, they will maximize the number of units sold. But there is always the risk of overproducing and pouring excessive amounts of money into inventory that sits in warehouses or on store shelves and might never be sold. The automobile industry pushes tens of millions of cars into the market every year, and tens of billions of dollars worth of unsold vehicles sit aging



on car lots throughout the world at any given point in time.<sup>2</sup>

Print production services were first offered commercially to outside clients early in the 16th century. This began a trend toward commercialization and fragmentation of print communication services that continued through the next five centuries. This trend reached its peak in the first few decades after the Second World War. To effectively use the print medium, one had to coordinate the work of many separate businesses that provided component goods or services. To publish a book in 1975 required the publisher to interface directly with copy editors, indexers, illustrators, book designers, typesetters, color separators, printers, bookbinders, distributors, and retailers. The process was linear, laborious, and lengthy. Today, as we will learn, it is possible for a publisher to achieve the same results by interacting with a single website.

In some markets, there is simply no alternative to the mass manufacturing push model. This is because the decision to buy the product is made only after the product is in the consumer's hand. The product has to be on the shelf before someone decides to buy it. Supply precedes demand. Most food products and many manufactured goods can only be sold this way.

Other products and services lend themselves more naturally to a *pull* production and distribution model. Build-to-order production systems have existed for centuries. Before the era of mass manufacturing, this was more the rule than the exception. However, it is only relatively recently that build-to-order has been implemented in manufacturing. Perhaps the best known example is the system that Dell uses to custom-manufacture computers. When you order a computer from Dell, the assembled computer system does not yet exist. Your order sets in motion a custom assembly and distribution process. Dell does not have to tie up capital maintaining inventories of completed systems in anticipation of future demand. This gives Dell a key advantage over competitors that rely on traditional mass production and distribution channels.

Digital technology has the power to reverse the trend that began with the Industrial Revolution to disintegrate the processes by which wealth is created into myriad sub-processes that required ever-increasing amounts of mediation by an ever-expanding army of mediators. In a disintegrated world, mediated experience became

the norm, because no single person had a view of the whole of anything. The re-integration of processes enabled by digital technology eliminates the need for mediation. Digital technology replaces mediated communication with direct communication, and mediated experience with direct experience. It diminishes the need for production-oriented work and opens the future to new creative vistas. It rescues us from the unpleasant disintegrated world of the Industrial Age and returns us to the hearth.

The place of print in this emerging world will change. Until recently print has been under the exclusive control of the mediators. Digital technology is transferring control of the medium into the hands of its users. What the users of communication channels want more than anything else is to engage in a two-way dialog with their customers and constituencies. The traditional print medium does not support this desire.

I am confronting this very reality as I sit here writing this book. You, the reader, remain invisible and silent to me throughout the long and laborious process of writing. I must rely upon a storehouse of knowledge that I have accumulated over many years about how people respond to ideas expressed in written form, and about the needs and wants of the audience I envision for this book. I use this knowledge to guide the writing process. When I have finished writing, I must then place my trust in the hands of other people who will design and market the product. By the time this book reaches you, your response to anything that I write will have no influence over the content. You may be compelled to send me an email responding to the book. (You can reach me at [cost@mail.rit.edu](mailto:cost@mail.rit.edu).) But, in the traditional publishing model, your response can't influence the content until the publisher decides to do the next edition.

The one-way nature of traditional print communications leads to a lot of wasted effort and overproduction. The publisher of this book is reasonably sure that you exist, and that there are enough other people out there like you who will purchase the book and justify all of the effort and expense of writing, designing, manufacturing, and distributing it. But what if the publisher is wrong? What if you don't exist? What if there is no audience for this book? All of our effort will have gone to waste. The copies of the book that we print and cannot sell will make a slow, painful journey from warehouse to

recycling plant or landfill where billions of unsold books and other printed products have gone before.

Although recycling reduces the volume of paper that ends up going directly into landfills, the energy required to collect and convert waste paper into recycled paper products is considerable. Printed paper once discarded therefore places a burden on the environment whether it ends up in a landfill or in a recycling plant. If the messages carried on the paper are never seen before the paper is discarded, the burden on the environment associated with its manufacture and disposal can easily be seen as being completely without redeeming benefits.

There has simply got to be a better way! And there is. We are witnessing the emergence of a new medium of print made possible by digital printing, the Internet, and the global infrastructure that supports high-speed digital communications among a rapidly growing percentage of the world population. Without the Internet, print must be pushed out into the world based on a prediction of its ultimate impact. Publishing this book without the help of the Internet is like making a break shot in a game of billiards. Once we hit the cue ball, we have no choice but to stand back and trust in the laws of physics. (This may not stop us from occasionally yelling at the breaking balls in a vain attempt to influence their behavior.) To extend this metaphor, the Internet makes it conceivable to engage each ball on the table in a separate dialog that will influence its path. If we figure out how to harness the interactive power of the Internet, we might live to see the day when we can convince every ball on the table to find a pocket.

The traditional medium of print uses the power of mass production and distribution to achieve economies of scale that counteract the huge material waste that results from a one-way push approach to mass print communication. The new medium of print uses the interactive platform of the Internet to harness the power of custom production and targeted distribution to make print a far more efficient vehicle for delivering value that is actively desired or demanded by the consumer.

To demonstrate our confidence in the long-term potential of the new medium of print, we will transform this very book from a traditional print media product to an exemplar of the new medium

of print during the course of publishing it. The book will itself serve as a bridge from old to new. As a result, you and I, reader and author, will see our relationship transformed. This book will start its life as a traditional print product, but soon after its initial publication, it will begin a process of evolution that will be shaped by the interactions that happen among a community of people interested in pursuing the ideas first crudely articulated in these pages. This transformation will be explained and initiated in the last chapter of the book.

This book has two purposes. The first is to survey the various capabilities and uses of print media in the world today, paying special attention to the forces at play in each domain of application. The second is to construct a new model for understanding the role of print in the emerging networked digital world. The book draws a picture of the current state of print communications, including discussions of the critical technology demands and trends in each market segment. The book has two parts. Part One describes common means of print production and distribution in current use. Part Two describes how print is used by organizations and individuals today, and illustrates the role of print as a component in new media solutions that serve emerging communication needs and wants.

The evolution of the print medium as a service to human communications from the middle of the 15th century to the present is a story of the gradual disintegration of the production process into narrowly focused crafts that each took a share of the value of the final product. We are at the beginning of a radical redistribution of power enabled by digital technology and the Internet that sets the stage for the emergence of an entirely new industry. This new industry seeks to reintegrate the production and distribution of print with the businesses that are served by it. The industry will be dominated by companies that provide the technologies that will enable this to happen.

In nearly every current application domain for print media there are powerful forces for change. Interpreted through the filter of old models, the collected forces resemble barbarian hordes descending upon the printing industry from all sides. For many in the industry, the natural impulse is to take a defensive stand and look for solace in the many proud centuries of history where print stood unchallenged as the sole medium of mass communication. From

this standpoint, print looks like the proverbial glass half-empty (and leaking). However, the opportunities for print enabled by digital technology appear to be an entirely new, potentially much larger glass that we are just beginning to fill.