Introduction

"In the bubble" is a phrase used by air traffic controllers to describe their state of mind, among their glowing screens and flows of information, when they are in the flow and in control. Lucky them. Most of us feel far from in control. We're filling up the world with amazing devices and systems—on top of the natural and human ones that were already here—only to discover that these complex systems seem to be out of control: too complex to understand, let alone to shape, or redirect.

Things may seem out of control—but they are not out of our hands. Many of the troubling situations in our world are the result of design decisions. Too many of them were bad design decisions, it is true—but we are not the victims of blind chance. The parlous condition of the planet, our only home, is a good example. Eighty percent of the environmental impact of the products, services, and infrastructures around us is determined at the design stage.[1] Design decisions shape the processes behind the products we use, the materials and energy required to make them, the ways we operate them on a daily basis, and what happens to them when we no longer need them. We may not have meant to do so, and we may regret the way things have turned out, but we designed our way into the situations that face us today.

The premise of this book is simply stated: If we can design our way into difficulty, we can design our way out. "Everyone designs," wrote scientist Herb Simon, "who devises courses of action aimed at changing existing situations, into preferred ones."[2] For Victor Papanek, too, "design is basic to all human activities—the placing and patterning of any act towards a desired goal constitutes a design process."[3] Designing is what human beings do.

Two questions follow this understanding of design. First, where do we want to be? What exactly are the "preferred situations" or "desired goals" that Simon and Papanek talk about? Second, how do we get there? What courses of action will take us from here to there?

Although this book addresses those two questions, it is not about the future, and it is not really about the new. I have organized the chapters that follow around ten themes that deal with daily life as it is lived now—not around fantastical science fiction futures. And I will tell you about aspects of daily life in which radical innovation is already emerging: Nothing you read here is a promise or a fantasy that may, one day, come true.

One of the things that drove me to write this book was boredom with the schlock of the new. Many of the "preferred situations" that Simon talked about already exist—but in a different and often unexpected context. One of the things you can do next Monday morning, after reading this book, is walk out of your door and take a look around. I am confident you will be surprised by the variety of social innovation taking place in your environment. I have been.

That said, addressing the question "Where do we want to be?" brings us up against an innovation dilemma. We've built a technology-focused society that is remarkable on means, but hazy about ends. It's no longer clear to which question all this stuff—tech—is an answer, or what value it adds to our lives. Too many people I meet assume that being innovative means "adding technology to it." Technology has become a powerful, self-replicating system that is accustomed to respect and receives the lion's share of research funding. In NASDAQ, tech even has its own stock exchange.

During the first part of the industrial age (and we are still in the industrial age, by the way), progress and development meant the continuous production of technology and more products, period. The spirit of that age is captured in an old Matsushita song:

Let's put our strengths and minds together
Doing our best to promote production
Sending out goods to the peoples of the world
Endlessly, and continuously.[4]

On the basis of this mindset, technology has evolved from a collection of tools used for doing things into a self-perpetuating system.[5] At the time, the benefits of technology seemed to be self-evident: better, faster,

smarter—and usually cheaper—products. But as the extent of technology's penetration into daily life has grown, the differences between gadgets have decreased; technology has become at best a commodity, at worst an infringement on personal space—a form of trespass even, or pollution. One reason the dot-coms failed is that they offered little value other than "tech" at a time when the culture had changed and tech was no longer an end in itself in our daily lives.

I do not suggest that we have fallen out of love with technology, more that we are regaining appreciation and respect for what people can do that tech can't. Throughout the modern age we have subordinated the interests of people to those of technology, an approach that has led to the unthinking destruction of traditional cultures and the undermining of forms of life that we judged, once, to be backward. The victims of this approach to modernization have not just been hapless people in rain forests. "Getting people to adapt" to new technology has affected us all. We believed that the assembly line and standardization would make the world a better place, yet along with efficiency came a dehumanization of work. We act no less as slaves to the machine today when we lambaste teachers as "obstacles to progress" when they do not embrace the latest technological fix for education.[6]

The introduction of a new mass technology—telegraph, railway, electrification, radio, telephone, television, automobiles, air travel—has always been accompanied by a spectacular package of promises. A certain naïveté is excusable for the inventors of those early technologies: They had no way of knowing about the unforeseen consequences of their innovations. Today, we don't have that alibi. We *know* that new technologies have unexpected consequences.[7]

The worst kind of tech push combines irresponsibility with wishful thinking. One of the worst current offenders is biotech. When Eugene Thacker (no relation) studied the biotech industry for a book he was writing, he encountered "blatant disparity between hyper-optimism and an overall lack of concrete results."[8] The future promises of biotech are many and far reaching, but Thacker could not help noticing the comparative absence of any concrete, widespread, sustainable results of the application of biotech in medicine and health care. We are victims, says Thacker, of "biotech imagineering" by vested interests that participate in the assemblage of enticing future visions.[9]

Being skeptical about technology does not mean rejecting it. There's a lot of technology in this book. For one thing, we don't have an either/or choice: Terra firma, and terabits, are both here to stay. Broadband, smart materials, wearables, pervasive computing, connected appliances, and other stuff we don't know about yet will continue to transform the ways we live. The question is, how?

Means and ends have lived apart too long in discussions of innovation. Understanding *why* things change—and reflecting on how they *should* change—are not separate issues. In the pages that follow, I try to reframe issues of technology and innovation in ways that make it easier for non-specialists to engage in meaningful dialogue—as things happen. Theodor Zeldin calls this the transition from an age of specifications to one of deliberation.[10]

We cannot stop tech, and there's no reason why we should. It's useful. But we need to change the innovation agenda in such a way that people come before tech. It will be an ongoing struggle, of course. From nineteenth-century mill owners to twentieth-century dot-commers, busi-nesspeople have looked for ways to remove people from production, using technology and automation to do so. A lot of organizations will continue on this path, but they're behind the times.

This book is about a world in which well-being is based on less stuff and more people. It describes an approach to innovation in which people are designed back into situations. In these situations, we will no longer be per-suaded that to be better off, we must consume more trashy products and devices.

The following pages describe the transition, which is already under way, from innovation driven by science fiction to innovation inspired by social fiction. I've collected the best examples I could find of designed services and situations in which people carry out familiar, daily-life activities in new ways: moving around, learning, caring for each other, playing, working. Some of these services involve the use of products, or equipment, to carry them out. This equipment ranges from body implants to wide-bodied jets. But objects, as a rule, play a supporting role. New principles—above all, light-ness—inform the ways they are designed, made, used, and looked after. The design focus is overwhelmingly on services and systems, not on things.

As well as designing people back into the picture, we need to design ourselves more time to paint it. Many of the so-called rebound effects of

innovation—results that are the direct opposite of what we intended—occur because we have inadequate time to try things out small, observe what happens, and reflect on how the bigger picture is changing. As I argue in chapter 2, velocity may be an imperative in the computer industry, but speed can be damaging in social situations.

One issue we need time to reflect on concerns the sheer number of people we have in the world. The planet's population has doubled in my generation's lifetime—something that never happened to a generation before. You and I are the first human beings who have had to adjust to such an explosion of numbers. And yet we persist in the pursuit of ''labor-saving'' devices and services—using tech as the means.

It's not that we're dumb. On the contrary, many millions of people have exerted great intelligence and creativity in building the modern world. It's more that we're being swept into unknown and dangerous waters by accelerating economic growth. On just one single day of the days I have spent writing this book, as much world trade was carried out as in the whole of 1949; as much scientific research was published as in the whole of 1960; as many telephone calls were made as in all of 1983; as many e-mails were sent as in 1990.[11] Our natural, human, and industrial systems, which evolve slowly, are struggling to adapt. Laws and institutions that we might expect to regulate these flows have not been able to keep up.

A good example is what is inaccurately described as mindless sprawl in our physical environment. We deplore the relentless spread of low-density suburbs over millions of acres of formerly virgin land. We worry about its environmental impact, about the obesity in people that it fosters, and about the other social problems that come in its wake. But nobody seems to have designed urban sprawl, it just happens—or so it appears. On closer inspection, however, urban sprawl is not mindless at all. There is nothing inevitable about its development. Sprawl is the result of zoning laws designed by legislators, low-density buildings designed by developers, marketing strategies designed by ad agencies, tax breaks designed by economists, credit lines designed by banks, geomatics designed by retailers, data-mining software designed by hamburger chains, and automobiles designed by car designers. The interactions between all these systems and human behavior are complicated and hard to understand—but the policies themselves are not the result of chance. ''Out of control'' is an ideology, not a fact.

To do things differently, we need to perceive things differently. In discussing where we want to be, breakthrough ideas often come when people look at the world through a fresh lens. One of the most important design challenges I pose in this book is to make the processes and systems that surround us intelligible and knowable. We need to design macroscopes, as well as microscopes, to help us understand where things come from and why: the life story of a hamburger, or time pressure, or urban sprawl. Equipped with a fresh understanding of why our present situations are as they are, we can better describe where we want to be. With alternative situations evocatively in mind, we can design our way from here to there.

Macroscopes can help us understand complex systems, but our own eyes, unaided, are just as important. All over the world, alternative models of organizing daily life are being tried and tested right now. We just need to look for them. When Ezio Manzini ran design workshops in Brazil, China, and India to develop new design ideas for an exhibition about daily life, he encountered dozens of examples of new services for daily life he had never thought of before—and also new attitudes. In many different cultures, he discovered, ''an obsession with things is being replaced by a fascination with events.'' Both young and old people are designing activities and environments in which energy and material consumption is modest and more people are used, not fewer, in the ways we take care of people, work, study, move around, find food, eat, and share equipment.[12]

In a less-stuff-more-people world, we still need systems, platforms, and services that enable people to interact more effectively and enjoyably.[13] These platforms and infrastructures will require some technology and a lot of design. Some services will help us share the load of everyday activities: washing clothes on the roof of apartment blocks, looking after children, communal kitchens and gardens, communal workshops for maintenance activities, tool and equipment sharing, networks and clubs for health care and prevention. The most important potential impact of wireless communications, for example, will be on the resource ecologies of cities. Connecting people, resources, and places to each other in new combinations, on a real-time basis, delivers *demand-responsive services* that, when combined with location awareness and dynamic resource allocation, have the potential to reduce drastically the amount of hardware—from gadgets to buildings—that we need to function effectively. Most of us are potentially both users and suppliers of resources. The principle of *use, not own* can ap-

ply to all kinds of hardware: buildings, roads, vehicles, offices—and above all, people. For more or less anything heavy and fixed, we don't have to own them—just know how and where to find them.

There are many things wrong with design in our world, but designers, as a group of people, are not the problem. Thirty years ago, in *Design for the Real World*, Victor Papanek observed that "there are professions more harmful than industrial design—but only a few."[14] This kind of blaming and shaming is counterproductive and unjustified. The world contains its share of selfish and incurious designers, of course. But no designer that I ever met set out to wreck the planet, force us to eat fast food, or make life miserable. Our dilemma is that small design actions can have big effects—often unexpectedly—and designers have only recently been told, with the rest of us, how incredibly sensitive we need to be to the possible consequences of any design steps we take.

Another reason not to blame designers for our ills is that many of them are working hard, right now, to fix them. They are designing new services and systems that are radically less environmentally damaging, and more socially responsible, than the ones we have now. This book contains many examples of their often-inspiring work. But the challenges and opportunities that face us will not be solved by designers acting on our behalf. On the contrary: As we suffuse the world with complex technical systems—on top of the natural and social systems already here—old-style top-down, outside-in design simply won't work. The days of the celebrity solo designer are over. Complex systems are shaped by all the people who use them, and in this new era of collaborative innovation, designers are having to evolve from being the individual authors of objects, or buildings, to being the facilitators of change among large groups of people.

Sensitivity to context, to relationships, and to consequences are key aspects of the transition from mindless development to *design mindfulness*.[15] At the heart of *In the Bubble* is a belief that ethics and responsibility can inform design decisions without constraining the social and technical innovation we all need to do. Design mindfulness involves a determination to

• think about the consequences of design actions before we take them and pay close attention to the natural, industrial, and cultural systems that are the context of our design actions;

▪ consider material and energy flows in all the systems we design;

▪ give priority to human agency and not treat humans as a "factor" in some bigger picture;

▪ deliver value to people—not deliver people to systems;

▪ treat "content" as something we do, not something we are sold;

▪ treat place, time, and cultural difference as positive values, not as obstacles;

▪ focus on services, not on things, and refrain from flooding the world with pointless devices.

Values and manifestos are an important guide to design decisions. But design defined only by limits and prohibitions will not flourish. Telling people to be good seldom works. As the underground classic *BoloBolo* puts it, "too many visions of the future stink of renunciation, moralism, new labors, toilsome rethinking, modesty and self-limitation. Of course there are limits, but why should they be limits on pleasure and adventure? Why do most alternativists only talk about new responsibilities and almost never about new possibilities? Why be modest in the face of impending catastrophe?"[16] The creation of interesting social alternatives has to be as exciting and engaging as the buzz of new technology used to be. A culture of community and connectivity has to be fun and challenging, as well as responsible. An aesthetics of service and flow should inspire us, not just satisfy us.

In the Bubble is about sustainable and engaging futures and the design steps we need to take to realize them. Our journey is not an easy one. We need to think, connect, act, and start processes with sensitivity. We need to foster new relationships outside our usual stomping grounds. We have to learn new ways to collaborate and do projects. We have to enhance the ability of all citizens to engage in meaningful dialogue about their environment and context, and foster new relationships between the people who make things and the people who use them. The "we" here is important. In a world of complex systems and constant change, we are all, unavoidably, "in the bubble." The challenge is to be both in the bubble and above it, at the same time—to be as sensitive to the big picture, and the destination we are headed for, as we are to the smallest details of the here and now.