

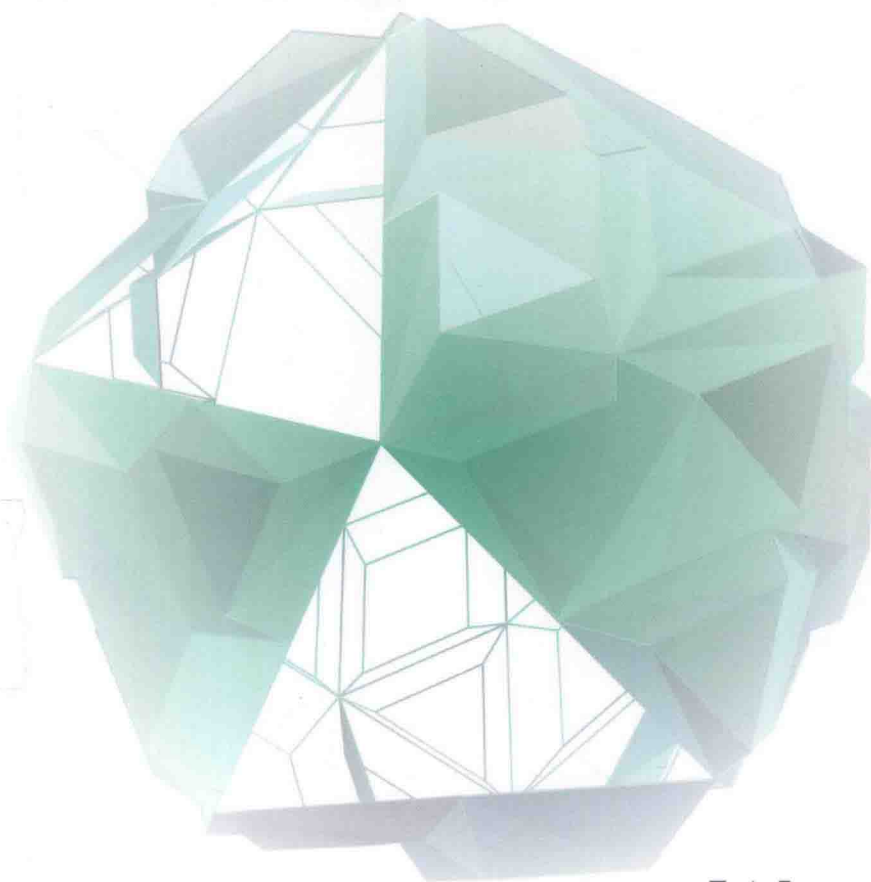
**Stevens Institute Series on
Complex Systems and Enterprises**

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PERSPECTIVES ON COMPLEX GLOBAL CHALLENGES

Education, Energy Healthcare,
Security, and Resilience

**Elisabeth Paté-Cornell
and William B. Rouse
with Charles M. Vest**



WILEY

PERSPECTIVES ON COMPLEX GLOBAL CHALLENGES

Education, Energy, Healthcare, Security and
Resilience

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TO CHARLES M. VEST

FRIEND, MENTOR, AND INSPIRATION

To his colleagues, his friends, and especially the faculty and students of MIT, of which he was the President from 1990 to 2004, Charles Vest was the ultimate role model. His intellect, his kindness, and his fairness have changed the professional and the personal lives of many around him. His death, in 2013, has been an immense loss, first to his family, and also to the world of academia, to the National Academy of Engineering that he led from 2007 to 2013, and to both of us, Elisabeth Paté-Cornell and Bill Rouse, who had been working with him on this book. The three of us had the vision of gathering the thoughts of a few of the luminaries among our friends who could help us think through some of the most difficult problems that we are facing, and that our children will most likely face as well.

We wanted to pursue this effort to completion, acknowledging Chuck's collaboration with us and hoping that by doing so, we can honor his memory. So we dedicate this book to Charles Vest, and also to his family, and especially to his wife Becky with our respect and our affection.

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INTRODUCTION AND OVERVIEW

ELISABETH PATÉ-CORNELL, WILLIAM B. ROUSE,
AND CHARLES M. VEST

INTRODUCTION

North America, Europe, and, perhaps to a lesser extent, other parts of the world are awash in debate, conflict, and often vitriol regarding how best to engender a healthy, educated, and productive population that is competitive in the global marketplace. The public–private enterprises engaged in providing education, energy, healthcare, security, and resilience are under scrutiny and stress.

These large-scale public–private systems are very complex and involve rich interactions of behavioral and social phenomena with designed and emergent physical and organizational infrastructures that are increasingly enabled by computer, communications, and other technologies. The range of stakeholders and their sometimes conflicting interests includes the public, industry, government, and in some cases international bodies. These stakeholders are not monolithic as, for example, various segments of the public or of industry may have divergent interests.

We have chosen to focus on five areas – education, energy, healthcare, national security, and urban resilience. These areas are laced with economic, environmental, political, and technology issues. They tend to be confounded by upside benefits and downside risks. Nuclear power is a good example.

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