



Developing Structural Engineers to Meet Tomorrow's Societal Needs

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Summary

The global challenges facing humankind over the coming decades require a new breed of structural engineer, more broadly capable than ever before. We must build international structural engineering coalitions to drive our profession forward, seizing the opportunity to assume leadership roles in helping society meet its grand challenges.

Keywords: education; professional development; competency; body of knowledge; strategy; globalization; leadership; entrepreneurship; innovation.

1. Introduction

The profession of structural engineering has a very long and distinguished history. Over many millennia structural engineers have been central to major projects and programs that have moved society forward. The reliability and performance of our works has been extraordinary. Society has placed a great deal of trust in our competence and integrity.

I will posit, however, that in the past several decades we have not kept pace with the challenges and opportunities before us. A structural engineer's education has changed slowly in the past century. Increasing applications of automation are replacing much of the labour we have supplied in the past, commoditizing our roles. Our codes and standards have become increasingly complex and prescriptive, stifling creativity and efficiency. As a profession we are not well structured to operate in a flattened world in which individual projects are accomplished with team members scattered around the globe. Some see our profession as struggling to attract and retain society's best and brightest.

A more positive view of the future of our profession focuses on humankind's grand challenges over the coming decades and the opportunities that those challenges present for structural engineers. These challenges are massive. Population explosion in developing countries will require construction of affordable housing, water distribution systems, transportation systems, and energy development and distribution systems on an enormous scale. But we must deliver such housing and infrastructure in a highly creative way without threatening the health and natural resources. Complicating these challenges are the accelerating impacts of climate change, complexity, and uncertainty.

As structural engineers we have a tremendous opportunity to play leadership roles in helping society meet its grand challenges. But this will require a new breed of structural engineer, more broadly capable than ever before, more communicative, more collaborative, and more creative. In the future, leadership, entrepreneurship, and innovation will define this successful new breed.

2. The World of Future Structural Engineers

To understand the future opportunities for this new breed of structural engineer, let's envision the future world in which they will operate. I suggest we look out to the year 2050, sufficiently far to