# Dr. Hugh McManus

*Senior Special Projects Engineer,* Metis Design
*Associate Director*, Lean Advancement Initiative Educational Network

Hugh McManus applies modern process improvement techniques to product development, health care, and government processes. He has done pioneering work in application of lean techniques to product development with MIT's Lean Advancement Initiative (LAI). He creates lean education and training materials, and disseminates them to both university curriculums and industry training programs, with LAI's Educational Network (EdNet). He also participates in lean transformation efforts in industry and government.

Dr. McManus is the co-creator (with Eric Rebentisch of LAI) of the Lean Enterprise Value (LEV) business simulation, which is used to rapidly teach advanced lean concepts, and allow participants to experience lean transformations in a simulated environment. The LEV is modular and adaptable, and is in use for training and education in a variety of fields, including lean manufacturing, engineering and product development, health care, leadership, and enterprise transformation. Dr. McManus trains the trainers at EdNet universities and LAI member companies to adapt and use EdNet material, including the simulation. He also directly supports transformation efforts. Recent projects include compiling lean best practices for a large multinational corporation, aiding the transformation of government acquisition practices, and applying lean concepts to healthcare systems.

Dr. McManus has co-authored a book on lean methods in the Aerospace Industry, *Lean Enterprise Value,* and published tools such as the "Product Development Value Stream Mapping (PDVSM) Manual." He has published over 60 peer-reviewed publications.

Dr. McManus maintains an interest in complex system architecture, and has worked on tools for dealing with the uncertainties and opportunities of the very early stages of design. He has also taught and practiced aerospace structures and materials. He was a structural engineer at Lockheed and Kaman Aerospace for a total of 10 years, and taught structures and materials courses at MIT for 7 years. He remains actively interested in aerospace structural engineering, composite materials, and durability in complex or challenging environments.

Dr. McManus received a Ph.D. in Mechanical Engineering from Stanford University in 1990, and S. B. and S. M. degrees in Aeronautics and Astronautics from MIT in 1980 and 1981. He has worked at Kaman Aerospace (1981-84), Lockheed (1984-1990), and at MIT as an Assistant (1991-97) and Associate (1997-98) Professor of Aeronautics and Astronautics and as a Principal Research Engineer (1998-2002). He is an Associate Fellow of the American Institute of Aeronautics and Astronautics.

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# Dr. Hugh L. McManus

*Selected Publications –*
*Enterprise Transformation and Product Design*


Murman, E., Allen, T., Bozdogan, K., Cutcher-Gershenfeld, J., McManus, H., Nightingale, E., Rebentisch, E., Shields, T., Stahl, F., Walton, M., Warmkessel, J., Weiss, S., and Widnall, S., *Lean Enterprise Value*, Palgrave, London, 2002.

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Ross, A. M., McManus, H. L., Long, A., Richards, M. G., and Hastings, D. E., "Responsive Systems Comparison Method: Case Study in Assessing Future Designs in the Presence of Change," Proceedings of AIAA Space 2008 Conference & Exposition, San Diego, CA, Sept. 2008.

McManus, H. L. and Rebentisch, E., "Experiences in Simulation-Based Education in Engineering Processes," 38th ASEE/IEEE Frontiers in Education Conference, Saratoga Springs, NY, Oct. 2008.

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*Selected Publications –*
*Composite Materials and Structures*

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