

35th DFMA FORUM  
June 17-19, 2024  
**ABSTRACT & BIO**

ABSTRACT

**Design for Manufacturing & Assembly Across Three Industrial Revolutions**

DFM and DFA practices started in the 2nd Industrial Revolution [IR] when people wanted improved household products and equipment that had remained plain and simple to make for centuries. People's desire for more aesthetically pleasing and functional designs spawned Industrial Design which then led to the DFM and DFA we know today. Frederick Taylor and Henry Ford laid down early markers. The USA's late entry into WWII, and that immediate need for production velocity, exposed many shortcomings of initial methods. Post-WWII industrial competition then increased the emphasis on also minimizing the costs. Several pioneers will be showcased, and what each sought to achieve. By the 60s and 70s, acquired knowledge started to become systematized. It was first implemented in reference tables and tools with "slide ruler thinking" - like the Westinghouse Wheel. In the 80s and 90s, computers and software enabled widespread corporate and then global use of DFM and DFA. As the 3rd IR unfolded, the digital revolution, enablement moved from tools wielded by experts to tools of teams across geographies; and practices became integral to the design management process. Plus, the digital revolution added a whole new "category" to the body of knowledge as 3D printing and multi-material products have their own nuances. With much still to be done, the 4th IR is already upon us. Sustainable designs, global designs, micro designs, 2D designs, biomaterials, bioplastics, and the integration of computer and internet technology into the fabric of products will certainly keep DFA and DFM healthy and moving forward.

35th DFMA FORUM  
June 17-19, 2024  
**ABSTRACT & BIO**

BIOGRAPHY

**BRADFORD L. GOLDENSE**  
**NPDP, CMfgE, CPIM, CCP, LSME, IEEEEM**



President  
Goldense Group, Inc.  
26 Fuller Street  
Dedham, MA 02026  
781-444-5400  
blg@goldensgroupinc.com

Brad Goldense is CEO of Goldense Group, Inc. GGI is a consulting, research, and education firm focused on attaining business results from R&D and Product Development. Now in its 38th year, GGI has helped over 200 medium and large corporations across four continents. He has worked in more than 700 manufacturing plants.

Brad also taught at the Gordon Institute, part of Tufts University engineering masters program, for nineteen years. Brad has a BS in Civil Engineering from Brown and an MBA in cost accounting from Cornell. He is a certified New Product Development Professional [NPDP], a Certified Manufacturing Engineer [CMfgE], a Certified Computer Professional [CCP], and is certified in Production and Inventory Management [CPIM]. He was recently awarded Lifetime Membership in both SME and IEEE.

Mr. Goldense has authored over 400 written works, and holds over 200 registered copyrights. Before founding GGI, Brad held positions at Texas Instruments, Price Waterhouse, AT Kearney, and CSCIndex. On a personal note, he'd love to talk with you about freshwater fishing.

*Updated 3/13/24*