

Paul C. Mugge

<https://www.linkedin.com/in/paul-mugge-b3746024>
<https://patternsofdigitization.com/>
<https://bai.poole.ncsu.edu/>
<https://www.fir.rwth-aachen.de/en/research/>



Summary

Mr. Mugge is presently the Innovation Professor (Emeritus) at Poole College of Management, North Carolina State University. Mr. Mugge is an accomplished industry and academic leader with over 50 years of experience. For the first 35 years of his career Mr. Mugge was a key contributor to IBM's R&D organization. In the past 15 years prior to his retirement, Mugge served as the Executive Director of Center of Innovation Management Studies (CIMS), a national research center dedicated to the advancement of business model innovation. In this capacity, with co-author Dr. Stephen Markham, himself a former Executive Director of CIMS, Mugge published the book *Traversing the Valley of Death*. Essentially the book is a handbook on how organizations can create new business models. Presently Mr. Mugge is engaged in a number of international research projects with the FIR Institute of Aachen University in Germany. The team recently co-authored the book *TRUST: The Winning Formula for Digital Leaders. A Practical Guide for Companies engaged in digital transformation*. Digital transformation represents the current height of business model innovation and the book recounts how the leaders of these risky ventures rely on their trust-building capabilities to succeed.

Experience



Innovation Professor, Executive Director (Emeritus), Center for Innovation Management Studies (CIMS)

Poole College of Management, NC State University, September 2005 to Present

Established in 1984, CIMS was the first NSF-sponsored Industry/University Research Center (I/UCRC) devoted exclusively to research on the management of technological innovation. Its sponsors were companies whose senior management was actively involved in advancing the innovation capacity of their firms. CIMS was dedicated to helping companies like these prosper in the face of global competition, rapid commoditization, and increasing demand for market differentiation.

Key accomplishments include:

- Authored the *CIMS Innovation Management Framework and Capability Maturity Assessment Model*, tools built for companies to assess and improve their ability to manage innovation.
- Co-PI, National Science Foundation (NSF) Research Project: National Partnership for Managing Upstream Innovation: The Case of Nanoscience and Technology.
- Secured free access from IBM for Watson to conduct over 25 projects in big data analytics with industry clients.
- Awarded the biggest industry grant in the history of Poole College of Management – Materials of Concern (American Coatings Association) that utilizes the predictive capability of big data analytics.

Based on witnessing how organizations can change the destiny of their organizations based on the power of big data analytics, I intend to focus my future efforts on working with Poole College's Business Analytics Initiative (<https://bai.poole.ncsu.edu/>), along with research colleagues at NC State University and at FIR Institute (<https://www.fir.rwth-aachen.de/en/research/>).



IBM Corporation, September 1969 – September 2005

For the first 23 years of his career (1969-1992), Mr. Mugge worked in IBM's product development community and held a number of global manufacturing and development positions including - System Manager for IBM's Mid-range S/370 Systems, VP of Manufacturing and Development for the ROLM/Siemens Corporation, VP of Development for IBM's Personal Systems Group and Lab Director of the IBM Boca Raton, Florida facility.

Key accomplishments include:

- Part of the team who developed the industry's first capability to simulate, test and manufacture VLSI (Very Large Scale Integration) circuits.
- Part of the design team who pioneered IBM's first self-diagnosing, self-healing computing system – The IBM 4300.
- Recipient of the IBM Innovation Achievement Award for the overall design and program management of IBM's first rack-mounted, "supermini-mainframe" – the IBM 9370.
- Led the development of IBM's first VLSI digital PBX – the IBM/ROLM 9370 CBX (Computer Based Exchange)
- Led the IBM taskforce who conceived of its ever popular laptop computer – the IBM ThinkPad.
- Led the teams, who three years in a row (1990 – 1992), won the prestigious "Best of Show" Award given to the most innovative product at the COMDEX trade show in Las Vegas.

From 1993 to 1998, Mr. Mugge was placed in charge of "rethinking" how IBM developed its products and services. The goal was to solve what Chairman and CEO Lou Gerstner termed IBM's "time-to-market crisis". Mr. Mugge picked his team from across IBM – Research, Software, Marketing, Finance, etc. to determine the baseline of IBM's *system* performance and its gap to best practice. The team instituted key performance indicators across the corporation and drove the design and implementation of a new development system. The result was a new business model, called *Integrated* Product Development (IPD), for developing winning solutions.

This experience taught Mr. Mugge that the "way " in which products are developed, that is - how the dimensions of strategy, organization, process, and information technology are dealt with - is essential to developing winning products. Mr. Mugge determined that product innovation is more than "good engineering" and frankly is broader than the Engineering organization. Product innovation is the result of informed, cross-disciplined teams (Marketing, Field Service, Sales, Procurement, etc.) working to a common purpose and supported with world-class processes and tools. For his efforts Mr. Mugge received the IBM Chairman's Award for leading the reengineering of its Product Development businesses. Most importantly, for the remainder of his IBM career (1999-2005), Mugge used the knowledge gained from this experience to help IBM's client's transform their own businesses. Frankly, it is this period of time, and the results Mr. Mugge achieved, that are most relevant in his position as CIMS Executive Director, and consequently, is the focus of Mr. Mugge's resume.

Partner, Strategy and Change Practice

IBM Global Services - Business Consulting Services, September 2002 – August 2005

Mr. Mugge worked with clients wanting to profitably grow their top lines by helping them increase their capacity to bring new, exciting products to market – effectively and efficiently. Mr. Mugge specialized in advancing these client's competitiveness through his expertise in market analysis, platform design, portfolio decision making, and project management. He focused client efforts on building an "integrated" business model design – integrating the dimensions of strategy, organization, process, and information technology – for sustainable growth.

Mr. Mugge worked with the CEO of a leading Japanese-based manufacturer of consumer electronic products. The CEO realized that despite continuing growth and success in Japan, the business model of his North American operations had fallen out of sync with market realities and lagged competition. The project entailed determining the specific and actionable elements that needed to be added to the company's "to be" business model in order to grow the business in the ultra-competitive US Consumer Electronics market. The team created new and easy-to-understand frameworks for analyzing a firm's business model and examined 15 competitive companies spanning multiple segments of the Consumer Electronics industry. Gaps with best-of-breed companies, by segment and business design element, were translated into the specific operational "components" (i.e., the processes, skills, information technology and organization) that would need to be improved in order to deliver the desired new business design capability. Finally, the team grouped component improvement initiatives into a set of transformation programs for the client. High-level business cases were generated, the plan prioritized, and placed on a two year timeline for the client. The CEO said that this work "far exceeded his expectations" and that he now "had the roadmap he needed to succeed in North American markets".

Mr. Mugge helped a Fortune 100 Internet Service Provider to transform their product development capabilities in support of a new growth agenda set by the CEO. The project entailed designing a new management/governance system, changing the resource allocation and budgeting processes, building a stage-gated product development pipeline, constructing portfolio management models, and developing the overall organizational change management program. The company's COO summed up the impact of this work by stating that it had significantly improved their ability "to place bets on winners".

Mr. Mugge worked with a Fortune 100 Telecom Equipment Supplier to transform their internal operational capabilities to be more "market-facing". The project entailed formulating the case for change, establishing corporate governance and resource allocation procedures, designing the firm's business process model, forming lean, cross-disciplined "domain" teams e.g., 'Serve Customer', 'Acquire Goods and Services', etc., to manage the portfolio of change programs, and then tethering the organization to the World Wide Web.

Global Solution Executive

IBM Global Services – Business Innovation Services, September 1998 – September 2002

So that clients would have a standard and rigorous approach to reignite their growth, Mr. Mugge was commissioned by IBM's Electronics Industry organization to lead the development of PIM_{TM} (*Product Innovation Management*). PIM_{TM} is a comprehensive methodology for improving a company's capacity to manage innovation. It utilizes the know-how IBM developed through transforming its own product/services development businesses. PIM_{TM} is aimed at helping IBM's customers achieve profitable, top-line growth by developing the disciplines of market planning, portfolio management, platform architecture, and pipeline management. PIM_{TM} concepts were validated on two successful business transformation engagements with major international electronics firms in Japan and Korea and because of its potential for helping clients achieve significant economic advantage IBM has filed for U.S. Patent coverage.

Business Transformation Strategist

IBM Corporation - Office of Corporate Strategy, September 1998 – January 1997

Mr. Mugge's mission was to align IBM's own information technology (IT) capabilities with its business strategy to become an e-business. Mr. Mugge proposed that Integrated Product Development (IPD) be

used for this task. A special version of IPD called Business Transformation Management System (BTMS) was created to manage IBM's IT "product" projects. Over 106 major IT programs (representing approximately a \$1B investment in IT on the part of IBM's business units) were evaluated and prioritized based on their contribution to making IBM a premier e-business. The projects that passed the filters of strategic fit, business value (to IBM), and technical sophistication and viability were funded and rigorously managed through their lifecycle using BTMS. Within a year 'ibm.com', and the many services it provides to customers, business partners and stakeholders, was selected as one of the best commercial websites in the world.

IBM Director, Development Reengineering

IBM Corporation - Office of Manufacturing and Technology, September 1993 - January 1997

Under the vision and leadership of Lou V. Gerstner, IBM Chairman and CEO, Mr. Mugge led the reengineering of its New Product Development process. The goal was to solve what Mr. Gerstner termed IBM's "time-to-market crisis". Mr. Mugge picked his team from across IBM – Research, Software, Marketing, etc., determined IBM's baseline performance and gap to best practice, instituted key performance indicators, and drove the design and implementation of this initiative. The result of this effort was a new business model for developing winning products faster called, Integrated Product Development (IPD).

While the transformation included streamlining IBM's business processes and deploying new IT tools - it also entailed, frankly, some much harder changes. IPD required that IBM adopt a new management system that "integrated" IBM's disparate functions into business-savvy, decisive Brand teams, accountable for all elements of the market mix. Changing how the money flows in the new model was everything to the speed and success of these teams -- and for that matter, IBM's fundamental ability to execute its strategy.

As a result of adopting IPD, IBM attained a 60% reuse of parts and common assemblies across its platforms, reduced its development cycles by 67 - 75%, cut project abandonment costs by 90%, achieved a number #1 or #2 market position in the markets it selected to pursue, and doubled its "R&D Productivity" (measured as R&D expenditures divided by revenue).



Company Commander, Battery Control Officer, Artillery Officer

US Army, May 1967 – September 1969

Prior to joining IBM, Mr. Mugge was an Artillery officer in the U.S. Army (Regular). Mr. Mugge served as Battery Control Officer of a Nike-Hercules nuclear missile battery in defense of Washington, D.C. and held a Top Secret security clearance. Following active duty Mr. Mugge served eight years in the U.S. Army Reserve as a Company Commander in the New York 98th Combat Engineering Division (AIT).

Education



Lieutenant Mugge was a Distinguished Military Graduate of Arkansas State University and received a Bachelor of Science degree in Mathematics. Mugge served as President of Tau Kappa Epsilon fraternity and was a member of Kappa Mu Epsilon (honorary Mathematics society). Mr. Mugge was selected to "Who's Who in American Colleges and Universities" (1967).

In addition, Mr. Mugge has attended various external and IBM management training programs – e.g., the Business Decision Making Executive Program at Colgate-Darden School of Business, University of Virginia (1981), IBM International Executive School, La Hulpe, Belgium (1988).

Publications

Mr. Mugge is published and was honored by the Industrial Research Institute with the Holland Award, given to the author of the 'best article for the past year in the field of industrial research' (re: *Make Platform Innovation Drive Enterprise Growth*, Mugge and Meyer, Industrial Research Journal, February 2001). As of this writing according to ResearchGate these publications have received over 150 citations.

- *TRUST: The Winning Formula for Digital Leaders. A Practical Guide for Companies Engaged in Digital Transformation*. Book, 2021. <https://www.amazon.com/dp/B08VF3LNFL>

We first studied the phenomenon of digital transformation through an extensive survey of global organizations. Called the Patterns of Digitization, the survey examined every aspect of how digital transformation is implemented. We looked at over 500 companies' business strategies, resource allocation, design practices, and looked at their "softer" side, like how the leaders communicate with employees. What we learned from this is—that no matter what type and size company you are, you fall into two different camps. Organizations are either "Digitally Developing" (the far majority), or they are "Digitally Mature". The jewel of this book is its in-depth interviews with proven, successful digital leaders. We didn't stop with just exploring their character and competency, we asked them "how specifically" they build trust through their intentions, integrity, capabilities and results.

- *Digital Leadership -Which leadership qualities contribute to digital transformation success?*, Conference: 2021 IEEE International Conference on Engineering, Technology and Innovation (ICE/ITMC), June 2021.
- *Managing your digital transformation. SIX PRACTICES OF DIGITALLY MATURE ORGANIZATIONS*, Taylor & Francis, Nov 2020.
- *DIGITAL LEADERSHIP - Character and Competency Differentiates Digitally Mature Organizations*. IEEE International Conference on Engineering, Technology and Innovation (ICE/ITMC), Cardiff, United Kingdom, June 2020.
- *Patterns of Digitization: A Practical Guide to Digital Transformation*. Research-Technology Management (RTM), Taylor & Francis, Feb 2020.
- *Patterns of Digitization – What differentiates digitally mature organizations?* 2019 IEEE International Conference on Engineering, Technology and Innovation (ICE/ITMC), September 2019.
- *The Gap Between the Practice and Theory of Digital Transformation*, Conference: Hawaiian International Conference of Systems Science, January 2017.
- *Traversing the Valley of Death: A practical guide for corporate innovation leaders*, Book: <https://www.amazon.com/Traversing-Valley-Death-practical-innovation/dp/0990985318>, 2015.
- *The Big Data Lever for Strategic Alliances*, Book Chapter: *Open Innovation through Strategic Alliances*, January 2014.

- *An Innovation Management Framework*, Book Chapter, *PDMA Handbook*, January 2013.
- *Constructing next generation academic cloud services*, International Journal of Cloud Computing, January 2013.
- *Services science to be taught at NC state*, Research Technology Management, November 2006.
- *Social networks key to harnessing nanoscience knowledge explosion*, Research Technology Management, May 2006.
- *Make Platform Innovation Drive Enterprise Growth*, Research Technology Management, January 2001.

Industry/Academic Voluntary Work

- (Present) Nominated to the Presidium of FIR, RWTH Aachen University, Germany. FIR is a research center focused on topics concerning the design of tomorrow's working world. FIR is a partner of BAI, Poole College at NC State University to research business transformation and digital transformation practices. <https://www.fir.rwth-aachen.de/en/research/>
- (Present) Member of BAI at Poole College, NC State University. <https://bai.poole.ncsu.edu/>
- Former Board of Director, International Association of Innovation Professionals (IAOIP).
- Former Board of Director, Bald Head Island Conservancy.