

TECHNICAL EXECUTIVE & BOARD LEADER

Fortune 1-2 Director leading global technology organizations at Amazon and Walmart, with prior VP and CTO roles across Owens-Illinois, Amcor, and Nano-Tex. Elected Board Director at Sigma Xi (Executive Committee, Finance Committee; led strategic planning for the world's largest scientific honors society). NACD member. 19 patents in AI/ML and engineering. Ph.D. in Technology and Management. Currently leading science, engineering, and software teams that invent with Generative AI and software systems to drive innovation at scale serving 1.5M+ employees globally.

PROFESSIONAL SUMMARY

- Amazon.com, Inc.,** Seattle, WA 2015 - current
Fortune 1 and \$717B multinational e-commerce and internet services corporation (NYSE:AMZN)
Director of Technical Product Development, Benefits Experience & Technology 2023 - current
Leading a global technology organization (130+ SDE/PMT/TPMs, and 250+ call center and back office) that builds and operates the systems delivering health, wellness, and financial benefits to 1.5M+ Amazon employees and families across 61 countries. Portfolio spans a \$40B+ financial benefits platform, \$11B health benefits ecosystem, and enrollment systems processing elections for 1M+ U.S. employees annually.
- Drove technology launches including the insourcing of all benefits administration software, Employee Prime Benefits, Open Enrollment redesign reducing completion time 85% including choose your plan simulator, and an AI-powered Benefits ChatBot with multi-agent architecture for personalized plan guidance.
 - Led organization through large-scale operational recovery, reorganizing 200+ engineers and closing all other programs to rebuild and stabilize the enrollment platform within 4 months for successful Open Enrollment.
 - Created and driving the 3-year technical architecture vision including multi-tenancy re-architecture, claims adjudication insourcing, cross-portfolio AI strategy, and benefits administration commercialization strategies.
 - Lead risk governance across \$158M-\$365M in accepted exposure spanning HIPAA compliance, third-party data security (51 assessments closed, \$43.6M risk reduction), and fraud detection.
- Director of Technical Product Development, AWS Industry Products** 2022 - 2023
AWS Industry Products co-develops software with our largest customers in the Clean Energy, Automotive, Healthcare/Life Sciences, Media/Entertainment/Telco/Sports, Sustainability, Manufacturing, and Operations industries. Led the research science and UX design teams (25 people) supporting the division, and led the product vision for the Manufacturing industry, creating software tools for factories that reduce waste, improve quality and drive sustainability.
- Director and Sr. Principal of Technical Product Development, Robotics Advanced Technology** 2015 - 2022
Created an incredible packaging team (+250 people) that reinvented packaging and fulfillment processes for the e-commerce marketplace. Team developed machine learning engines and software to reduce wasteful packaging, created more compact packaging to reduce air shipped, and drove advances in material science to replace plastics with novel recyclable material. These innovations scaled across +12B shipments/year, driving waste reduction and sustainability wins for customers. Since 2015, Amazon has reduced packaging weight per shipment by over 38% and eliminated more than 1.5 million tons of packaging.
- Walmart Inc.,** Bentonville, AR 2014 - 2015
Fortune 2 and \$681B multinational retail corporation (NYSE:WMT)
Senior Director of Innovations - Enterprise Analytics, Platforms and Products
Led the creation of new capabilities to forecast the future of retail through big data analytics. Responsible for big data visualizations in our Data Café, the implementation of high-performance computing infrastructure, and the marketing and customer analytics and machine learning that forecasts the future of retail based on this amazing data set. Team included 65 associates and 80 contractors, representing all research/applied and data sciences, statistics/analytics, machine learning, and software/API development disciplines. Additionally, led the team that created the enterprise-wide technology strategy and roadmap for the integration of physical stores with the future of digital commerce. This effort included a comprehensive strategic plan and budget for IT for over 8,000 global resources.
- O-I Glass (formerly Owens-Illinois),** Perrysburg, OH 2011 - 2013
Fortune 345 and \$6.5B packaging company (NYSE:OI) with 81 plants in 21 countries.
Global VP of Research and Development
Led the global R&D team to reinvent glass manufacturing methods and equipment, substantially reducing company's ecological footprint and manufacturing costs supporting O-I's 81 plants and global business partners. Managed 120 staff, representing all design, engineering, software and science disciplines, as well as analytical and global technical field services.

- *Technology Transformation Strategy & Results:* Envisioned 5-10-year strategic R&D roadmap that aligned R&D initiatives with corporate strategy. The strategic plan included detailed project plans, talent assessment with hiring plans, and approval for a near doubling of the capex/opex budget to \$55M.
 - Successfully drove technology breakthroughs in manufacturing process and capital equipment design, to carve out 35% of energy cost (\$255M/year). Efforts resulted in patent filing increases of 5x, from 12 to 60/year.
 - Created significant innovation in the design and installation of computer-aided engineering high performance server infrastructure (CAE HPC), resulting in a 15x increase in calculation speed.
- *Designed and Built Pilot Plant:* Lobbied and received \$3M in funding from Ohio Third Frontier's Industrial Research and Development Center Program to kick-off development of a 18,000 ft² pilot plant. Designed, funded, and commenced construction for a \$35M glass manufacturing pilot plant in under a year.

AMCOR LIMITED, Manchester, MI

2006 - 2011

\$15B packaging company (NYSE:AMCR) Products include plastic containers, flexible packaging, glass, and corrugated boxes.

VP of Global Product Development and Technical Services – Plastic Packaging

Recruited to build world-class global product development (R&D) organization, develop new technologies, and serve the packaging design and development needs of Coke, Pepsi, Campbell's, Diageo, Method, Bausch & Lomb, J&J, hundreds of leading FMCG brands, and OTC/pharmaceutical manufacturers. Created new injection molded preforms and blow molded and extrusion plastic packaging used in hot-fill, carbonated and aseptic fill applications. Managed 120+ staff (\$29M budget) in all areas of product development: market research, industrial design, computer-aided design, finite element analysis, engineering, innovation, global technical services, AIB-certified pilot plant, and analytical services.

- *P&L Responsibilities:* Developed and managed P&L, operating plan and strategic growth plan as key member of executive staff for \$3B division producing 28 billion containers each year. Team delivered 5-year improvements in operating margin (6.1% to 8.1%) and PBIT (\$9.4M to \$15.5M).
- *Groundbreaking Strategic Direction with High-impact Performance:* Drove innovation, growth, and business value through upgrading talent, creating product design capability, and partnering with business to deliver initiatives that enabled growth, speed, and agility.
 - New products launched increased 120%, hit rate increased from 22% to 57%, and sales refreshed the product portfolio delivering \$700M/year.
 - Sales of new products drove 3-year NPDV (new product development vitality) from 27% to more than 52%.
 - Team created a rich intellectual property portfolio with 250+ disclosures and 46 issued patents.
- *Improved Speed to Market/Reduced Cost to Serve:* Achieved speed to market improvements of 31% and reduced cost to serve by 22%. Net Promoter scores rose from 21% to more than 51% due to improvements in understanding the voice of the customer, driving innovation, program management, and enhanced speed to market.

NANO-TEX, INC., Emeryville, CA

2004 - 2006

Leading advanced materials start-up company applying nano-material technology to the textile industry. Credited with pioneering the "Everyday Performance Clothing" category at retail, resulting in 200 apparel brands and licensed mill partners using the products. Named to the Red Herring Top 100, recognizing the most promising private technology companies.

Chief Technology Officer

Recruited to build and lead the R&D organization, develop and commercialize portfolio of patent-protected products, and the intellectual property strategy as part of the executive staff. Developed and managed the operating and strategic growth plan to prepare the company for public offering, including recruiting over \$35M of venture capital funding. Built and managed the R&D, technical service, and quality control functions worldwide, with more than 70 staff in 8 countries.

- *Breakthrough Products:* Launched 5 new chemical treatment products (Repels and Releases Stains, Coolest Comfort, Resists Static, Neutralizer, and Dry Inside) to the global network of licensed mill partners (with 14 patent disclosures for novel polymers). Sales of new products doubled the size of the business in 3 years.
- Won NASA's Nanotech Briefs Nano 50 awards for "Best of the Best" – the innovative people and designs that will move nanotechnology to key mainstream markets.

OMNOVA SOLUTIONS INC., Fairlawn, OH

2001 - 2004

Leading supplier of commercial films (NYSE:OMH), specializing in the design and manufacture of commercial wall coverings, coated fabrics, and decorative laminates.

Director of Technology and New Product Development - Decorative Products Division

Managed the product development portfolio to satisfy customers' needs for innovative decorative products. Directed 36 engineers and chemists in 6 locations; influenced development in 2 Asian joint venture facilities. Contributed to the development of company's strategic plan, operating plan, and restructuring strategies.

The Dow Chemical Company, Freeport, TX
Fortune 82, \$54B diversified chemical company (NYSE:DOW).

1998 - 2001

Technology Development Scientist - New Business Development

Worked with business managers to identify target markets for new inventions, creating profitable new business. Contributed to research, development, and testing for new portfolio of apparel fiber-forming polymers.

BOARD APPOINTMENTS/OTHER KEY ROLES

Amazon Bar Raiser – unique aspect of Amazon’s hire and develop the best culture 2022 - current
Sigma Xi, the Scientific Research Society, Nonprofit Corporation and LLC, Raleigh, NC 2013 - 2016

Director, Board of Directors

Sigma Xi is the largest scientific honors society in the world, and was founded in 1886 to honor excellence in scientific investigation. Elected to the Board of Directors, served on the Executive and Finance committees, and led the strategic planning process. The society encourages research through grants from our endowment, administers the grants program for the National Academy of Sciences, and publishes the American Scientist magazine. Also a member since being nominated in 2003.

Member - National Association of Corporate Directors (NACD) 2013 - current

Director, Board of Advisory - Michigan State University, School of Packaging 2011 - 2014

President/Co-Founder, Cleveland Chapter - Product Development Management Association 2003 - 2004

Co-Chairman of the Alumni Board - Michigan State University, Human Environment and Design 2002 - 2004

EDUCATION

Ph.D., Technology and Management, emphasis in Manufacturing Processes, Human Factors and Statistics 1998

M.S., Textile Engineering, Chemistry and Science (polymers/plastics formation) 1991

North Carolina State University, College of Textiles

- Thesis work evaluated the relationships between human physiological and psychological comfort and thermal insulation and moisture permeability of fire-resistant materials, leading to improvements in DuPont’s Nomex fibers.
- While in graduate school, consulted for Arthur D. Little, Kimberly Clark Corporation, Research Triangle Institute, and ILC Dover. Specialized in protective apparel and equipment, and led development of a wide range of products: space suits, nonwoven surgical gowns and cleanroom garments, military protective uniforms and equipment, baby diapers, adult hygiene products, and urinary collection devices (medical devices) for female military pilots, thermoregulatory medical devices, medical monitoring equipment, and high altitude flight suits.
- Established a state-of-the-art comfort research laboratory and developed test methodologies and research protocols to evaluate surgical gowns, diapers, and other consumer products.
- Determined relationships between product acceptance and hedonics (the tactile, thermal and moisture permeability properties) of nonwovens and other textile materials to develop predictive models of consumer preference. Modeling led to a competitive advantage in consumer acceptance of products.

B.S., Science and Honors College 1987

Michigan State University, College of Human Environment and Design

Associate in Industrial Design 1986

Fashion Institute of Technology, College of Design

PATENTS

PREDICTIVE PACKAGING SYSTEM – US patent 11887021 (2024). Optimization for item packaging, in particular, a machine learning model is used to generate a decision that identifies a package type (e.g., corrugated box, padded mailer, etc.) for an item ordered by a customer. Input to the ML model includes data about the item, such as the item description from the catalog and/or an actual image of the item. Other inputs can include customer data and fulfillment data. The decision can also consider multiple cost optimization parameters such that the cheapest package type can be used, while meeting a target damage rate. The ML model is trained based on historical damage rates.

Large Language Model for Manufacturing based on OPC-UA and other manufacturing data – IDF (2023).

Reinforced Shipping Container – US patent 11301604 (2022). Selective strengthening of packaging materials to efficiently improve package strength. Load conditions for handling and transport are simulated, and weak or susceptible areas of the package are identified. Strengthening materials are then selectively applied to the weak points, thereby increasing the strength of the package where it is needed, without wasting excess material.

Flexible Packaging Rib Stiffeners – US patent 11299335 (2022). A padded mailer includes ribs that provide stiffness, especially in the transverse direction. The increased stiffness helps prevent the mailer from flipping over during conveying, which would put a label on the underside of the mailer.

Flexible Packaging Having Lateral Stiffness – US patent 11,338,981 B1. A padded mailer includes elongated air cells that provide stiffness, especially in the transverse direction. The increased stiffness helps prevent the mailer from flipping over during conveying, which would put a label on the underside of the mailer.

Profile Based Augmented Reality Applications Based on Information Tags – US patent 11194983 (2021). A tag positioned on an object provides information for selecting augmented reality content that is based, on a user profile or other user information. The tag may be utilized to transmit messages between users where AR content can be integrated into the message and presented upon scanning and processing of the tag. The AR content may also be related to the user interests or real time user information such as user location. The user may interact with the content to retrieve additional information, which provides an improved customer experience and integration into a provider ecosystem.

Packaging Material Having Patterns of Microsphere Adhesive Members that allow for Bending around Objects – US patent 10501252 (2019). A packaging material wraps around an object so as to protect the object from damage. The material has a substrate and a plurality of adhesive members adhered to the substrate, each having a plurality of microspheres. The adhesive members are arranged on the surface in a pattern so as to define first and second pluralities of pairs of linear arrays of the adhesive members. The linear arrays of the first plurality are elongate along a first direction and are spaced from one another so as to define a first bending gap between the linear arrays in each pair of the first plurality. The linear arrays of the second plurality are elongate along a second direction, angularly offset from the first direction, and are spaced from one another so as to define a second bending.

Packaging Recommendation System – US patent 11479379 (2022). A packaging decision system for recommending packages for varying items. Once an order for an item is obtained, fit parameters for the item (such as size and compressibility) are applied to a trained machine learning model to recommend a particular packaging type based on the parameters and how the package type can conform to different sized items. The model can be continually trained based on shipping experiences and other factors.

Grid-Optimization, a Planning and Optimization Framework for Dense Storage and Retrieval Systems in Grocery Automation – Amazon application underway P80718 (11/2022).

A Fast and Scalable Method for Packing Perfect Grocery Bags in Online Grocery Retail – Amazon application P79760-US01 (2022). A packaging system for improving the bagging of items, such as grocery items. Each item in a catalog can have a score that indicates the order in which the item should be arranged in a bag relative to other items and their corresponding scores. Based on the score associated with the item, a particular sequence to bag items in an order can be determined. A machine learning model is used to generate a score for every item in an order/inventory.

Packaging Decision System for Reducing Shipping Damage and Material Use – Amazon application 84156220 and 84171282 (2019, 2020).

Packaging Suite Optimization System – Amazon application P71368-US01 (2020).

Optimal Fit System for Flexible Packaging and Multi-item Shipments – Amazon application P69182-US01 (2020).

Print on Demand Structural Exoskeleton Packaging – Amazon application P66998-US02 (2019).

Topologically Optimized eCommerce Packaging for Enhanced Strength to Weight Ratio – Amazon application P68007 closed (2019).

Customer Specific Augmented Reality Messaging – Amazon application P65480-US01 (2019).

Surprise and Delight: AR and Physical Cardboard Boxes – Amazon application P65487-US01 (2019).

Sealed Ribs for Bubble Mailer – Amazon application P63805 (2018).

Rigid Bubble Mailer – Amazon application P63576 (2018).

Targeted Application of Expanded Adhesive to Deliver Cushioning – Amazon application P40196-US (2019).

Repurposing Product to Deliver Customer Value Added Packaging – Amazon application P32478-US (2016).

Targeted Application of Expanded Adhesive to Deliver Thermal Insulation, Cushioning and Decorative Patterns – Amazon application (2016).

Customer's Conditioned Response Logistic Prediction Engine – Walmart application (2015).

Integrated Meal Plan Generation and Supply Chain Management – WO patent 2017003874 (2017).

Container Having Oxygen Scavenging System – US patent 8,496,885 (2013); US patent 9,289,938 (2016); WO patent 2,011,112,775 (2006).

Education Tools and Methods for Demonstrating Enhanced Performance Characteristics of a Textile Product to a Person – WO patent 2,006,029,004 A2 (2006).

Dow XLA Elastic Freedom Fiber – US patents 6,437,014 (2002); 6,803,014 (2004); WO patent 2,001,085,843 (2001).

Kimberly Clark's Raised Arm Coverall – US patent 5,509,142 (1996); WO patent 1,995,001,109 (1995).

TECHNICAL PAPERS AND PRESENTATIONS

[Engineering Packaging for E-Commerce Fulfilment](#), speech at Pack Expo, 2020.

[Machine Learning Drives Sustainability](#), speech at AWS re:Invent conference 2019.

[Top Companies, what it's Like Being Part of The Amazon Team](#), cameo in LinkedIn News, 2018.

[Kim Houchens, Ph.D. is Amazon's boxing champ](#), interview in LinkedIn News, 2018.

- Mad Scientists or Brilliant Inventors? How to Keep Your Staff Running like a Well-Oiled Invention Machine***, The PDMA Tool Book 3 for New Product Development, edited by Abbie Griffin and Stephen Somermeyer, p.315-336. Hoboken, NJ: John Wiley and Sons, Inc., 2007. Dr. Kimberly Houchens and Douglas Neff.
- Product Development Executives Offer Insight to Ensure New Product Success***, Sopheon, 2003.
- Fiber Breaks During Spinning of Affinity EG8200 (Polyethylene)***, K. Houchens, R. Patel, R. Reid, S. Bensason, T. Ho, Dow Chemical technical report, 2000.
- Moisture in the Microclimate - Influence on Comfort of Apparel Items***, Ph.D. dissertation, NCSU, 1998.
- Total Quality Management and the House of Quality - The Product Development Process in the Textile Industry***, Ph.D. qualifier paper, NCSU, 1995.
- Comfort and Performance Properties of Long Underwear Materials***, R.F. Goldman and K. Houchens, Arthur D. Little technical report, 1995.
- Heat Stress and Productivity Loss Due to Personal Protective Equipment***, R.F. Goldman and K. Houchens, Arthur D. Little technical report, 1994.
- Evaluation of the Thermal Characteristics of the Standard and Prototype Army Air Crew Helmet***, R.F. Goldman and K. Houchens, Arthur D. Little technical report, 1993.
- Evaluating the Hand of Nomex Workwear Fabric***, M.S. thesis, NCSU, 1991.