

Leveraging Industry Experience to Instill the Innovation Mindset

Santokh Badesha

Board of Trustees Meeting

10/9&10/2025



Outline of Presentation

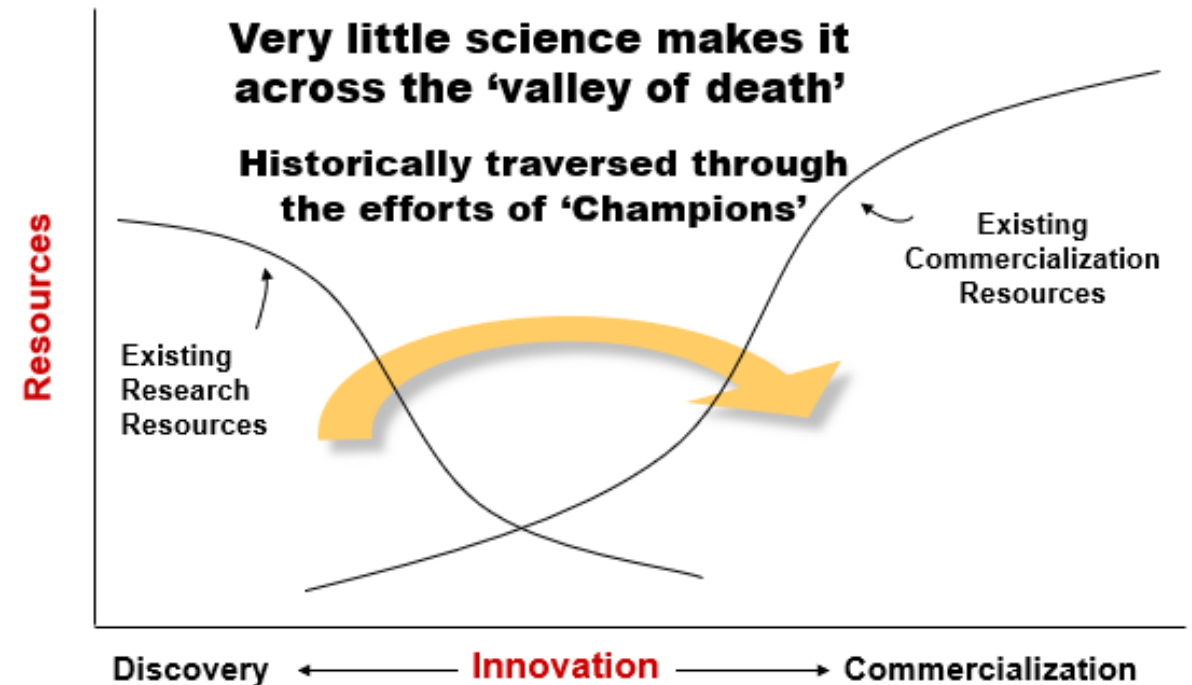
- **Personal Introduction**
- **Industrial Career at Xerox: Driving materials innovation and intellectual-property management shaping printing systems worldwide**
- **Attributes of the Innovation Mindset**
- **Academic Career at Purdue - Advancing the University's Innovation Ecosystem through teaching, scholarship and national and international service**
- **Current Research – Developing Alternatives to PFAS**

40+ Year Industrial Career at Xerox

Materials Breakthroughs for Printing Systems via Open Innovation

- From Senior Research Scientist to Corporate Fellow
- Designing advanced materials and surfaces to meet multiple, often conflicting performance requirements, and then integrating these solutions seamlessly into subsystems and full printing systems.
- Record breaking patent portfolio – ongoing and moving into new areas like 3D printing.
- Documented invention disclosures (IDs) -- (447), US Patents issued thus far (275) and an additional (55+) pending at USPTO.
- Most of these patents have also been filed in the EU and far east countries.

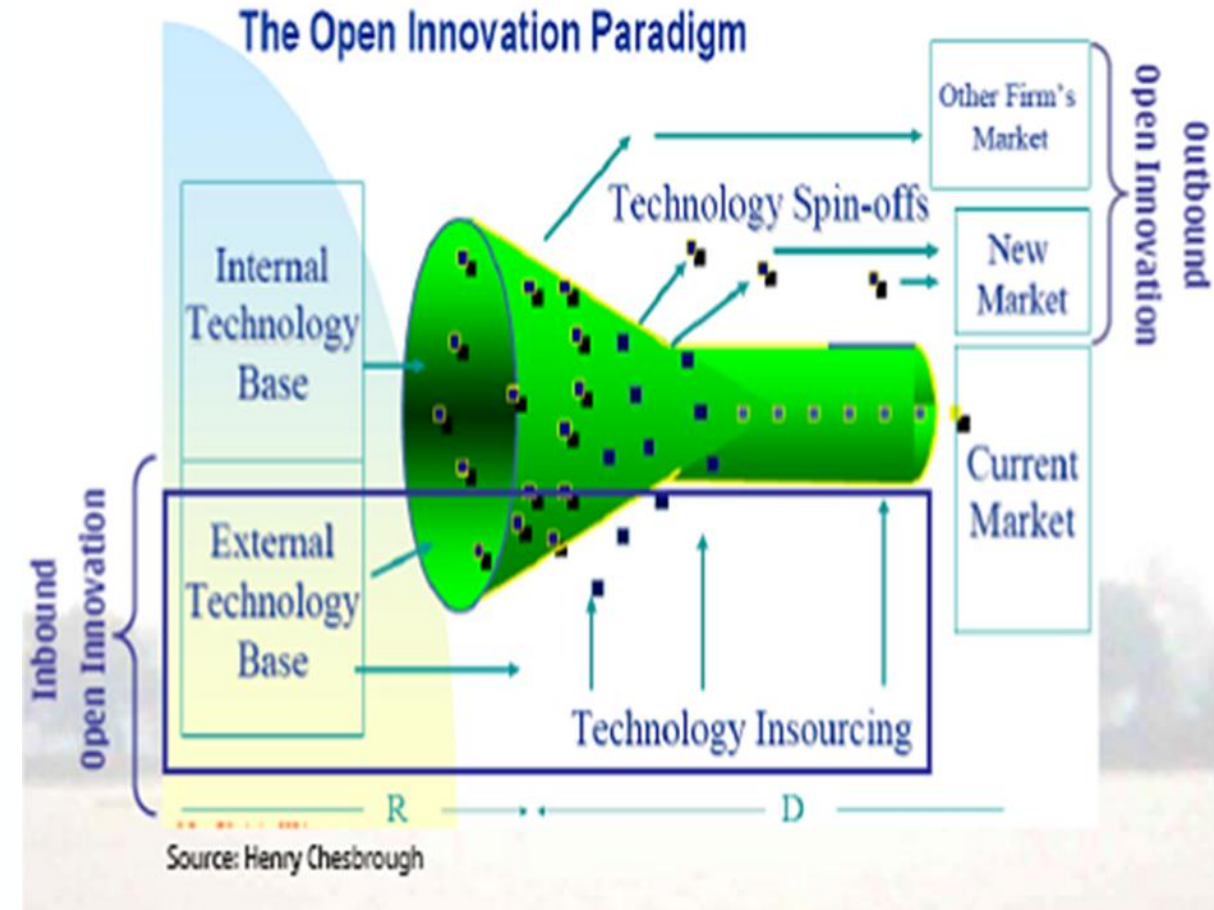
The 'Valley of Death'



Scientific Uncertainty	Scientific Risk	Technical Risk	Engineering Uncertainty	Manufacturing Uncertainty	Market Risk & Uncertainty	Exogenous Risk & Uncertainty
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Attributes of the Innovation Mindset

- **See Ideation as Only the Beginning**
Treat a prototype as a starting point; plan early for translation and scale-up.
- **Demonstrate Value and Shared Stakes**
Clearly show an idea's potential and why it matters to everyone involved.
- **Build Networks and Make Connections**
Link ideas with the right people, resources, and markets; innovation thrives in a village.
- **Empower Partners to Unlock the Multiplier Effect**
Share ownership so others can mature and enhance the technology for greater impact.
- **Engage with Many Hills, Not One Mountain**
Stay curious and spread your efforts across multiple challenges instead of over-investing in one.
- **Leverage Diverse Skills and Perspectives**
Seek out different expertise and viewpoints to accelerate learning and uncover new angles.
- **Span Boundaries and Track Trends**
Stay alert to developments beyond your field and connect them back to your work.



Selected Honorary Recognitions Based on Scientific and Engineering Impact

2024: Fellow, Indian National Science Academy (INSA)

2024: 2023: Honorary Life Member, Royal Society of Chemistry, UK;

2022: Fellow, IET (Institution of Engineering and Technology, UK)

2022: Mountbatten Medal, Institution of Engineering and Technology (UK)

2022: Rishi Raj Medal for Innovation and Commercialization, American Ceramics Society

2022: Power 50 Technology List, Rochester Business Journal

2022: Fellow, National Academy of Inventors (NAI)

2021: Member, National Academy of Engineering (NAE)

2021: Honorary Member, Society for Imaging Science & Technology

2009: Chester F Carlson Lifetime Achievement Award, Society for Imaging S & T.

1997: Distinguished Inventor of the Year Award, Rochester I P Law Association

1997: Proclamation by the Mayor, Rochester, NY

1985: Fellow, Royal Society of Chemistry, UK



The National Medal of Technology: 2007



**Xerox CEO Ms. Ursula Burns and I
at the White House**

DSc (Honorary), *Delivered 114th Commencement Address at Clarkson U; and Clarkson U established a "Santokh S Badesha Leadership Scholarship".*

- Degree was awarded *"for his successful career-long effort to connect novel scientific principles with innovative technological application"*
- Clarkson University started this scholarship in 2011 and pays \$11.5K /year to one incoming freshmen student every year.

Current Role at Purdue: Advancing the Innovation Mindset via Intellectual Property Education and Scholarship

- **Purdue Course: ECE 69500** - Ideas to Innovation (I2I), Professional Masters Program project track nine credit course.
- **Purdue Course: ECE 50005**- “Intellectual Property Generation and Management- An Inventor’s View”.
 - Course introduces students to the generation and management of intellectual property, internal processes, USPTO filing procedures, and the business aspects of managing and enforcing patents.
- **Department of State** : Three credit version of course customized for semiconductor supply chain development.
- A fully on-line version to split the three credits into three one credits, and micro-credentials in progress.
- NAI also provides an innovation certificate to students who pass the exam.
- Students interact directly with technical leaders in leading U.S. companies who share their internal process for IP generation and management. e.g. ANSYS, Dow, Ericsson, Kodak, IBM and more.



Current Role at Purdue: Advancing the Innovation Mindset via Intellectual Property Education and Scholarship

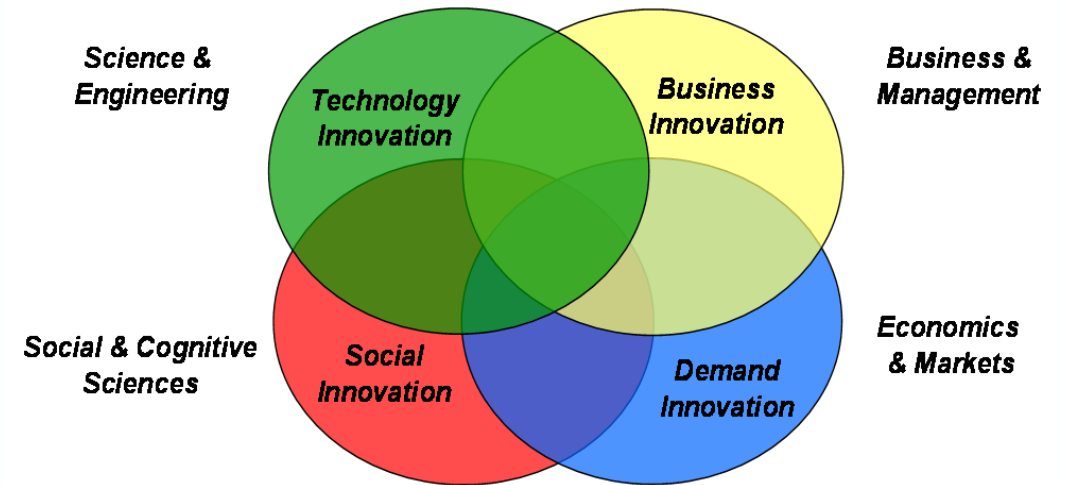
Forthcoming Book:

- *Innovation Engineering of Technical Systems: Theory, Methods, and Practice* (2026, World Scientific Publishers)
- A comprehensive framework for understanding and practicing innovation engineering from the test tube to the customer's hand.
- NAI will be endorsing and forewording the book.

Current Role at Purdue: Advancing the Innovation Mindset via Intellectual Property Education and Scholarship

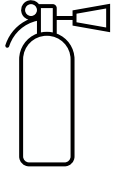
- Undergraduate Major
 - With two concentrations:
 - 1) Strategy and Management Consulting
 - 2) Innovation Management and Entrepreneurship.
- Why? Both MS and Major focus on business plan and process changes with adoption of new technology while bridging STEM and Business.
- Both are currently under review by Daniels School of Business Curriculum Committee.
- Developed in collaboration with Tom Brush.

Components of Innovation



Innovation: CDDC (Create, Develop, Deliver and Capture Value)

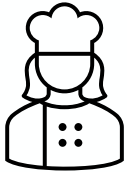
Current Research Focus: PFAS Alternates



Firefighting
Foams



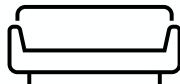
Personal Care
Products



Non-Stick
Cookware



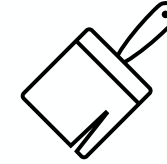
Fast Food
Packaging



Stain Resistant
Furniture



Microwave Popcorn
Bags



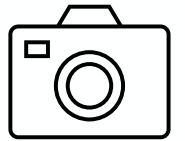
Paint



Water Resistant
Clothing



Cosmetics



Photography



Pesticides

- Experience addressing the presence of PFAS (Teflon, Teflon based coatings, and release agent management fluids).
- Secured and commercialized US Patents in Nuvera/Tigris family U.S. Patent 6,830,819; U.S. Patent 6,808,814; and U.S. Patent 6,808,815.
- Established industry collaborators and development partners e.g., Wacker Silicones, Dow Corning, Shin-Etsu.
- Initiated dialogue with Purdue faculty (Jeff Youngblood and Carlos Martinez) for a consortium.
- NAE has started PFAS detection and replacement as an initiative.

Advancing Innovation Nationally : National Academies (NAE, NAS, NAI, NSF, IET) and Purdue

- **NESM-NRC:** Research Associateship Programs Reviewer.
- **Member, Committee on Division of Engineering and Physical Sciences (DEPS).**
 - DEPS provides independent and authoritative advice to the federal government and the nation on important S&T policy issues. Recommendations from the DEPS reports support national science and policy decisions.
- **Institute of Engineering & Technology (IET), UK** - Serve on the panel to evaluate IET Achievement Awards/Medals and fellowship nominations.
- **Member NAE Core Team Member:** *Guiding Future Learning and Innovation Practices in Engineering.*
- **National Academy of Engineering-** Member, Peer Committee (PC-12) and Committee on Members (COM).
- **National Academy of Inventors (NAI):**
 - Council Member, NAI Fellows selection.
 - Intellectual Property Advisor to member institutions.
 - Currently working to establish NAI chapter at Purdue.
- **Purdue:**
 - Purdue Senator representing COE and ECE, ECEP+ and Distinguished Professor Committee (DPC) for ECE and DSB.
 - Supporting recognition of incredibly rich talent pool of Purdue faculty at National and International Academies.

Thank You

sbadesha@purdue.edu



Xerox Recognitions

- **2022:** Santokh Badesha Wall of Fame
- **2019:** Induction to the Xerox CEO Club
- **2007:** Most Prolific Inventor, Xerox Corp.
- **2001:** Inducted to the Hall of Fame of Xerox Innovation Group
- **1999:** Chester F Carlson Eagle Award
- **1998:** Xerox Eagle Award
- **1997:** Excellence in Management Award
- **1996:** The President's Award
- **1996:** Special Recognition Award
- **1994:** Xerox Eagle Award
- **1993:** Excellence in Science & Technology Award
- **1992:** Xerox Eagle Award
- **1992:** Outstanding Team Leadership and Management Award
- **1992:** Team Excellence Award
- **1990:** Xerox Eagle Award
- **1989:** Excellence in Science and Technology Award
- **1989:** Achievement Award
- **1988:** Achievement Award
- **1988:** Achievement Award
- **1983:** Excellence in Science and Technology Award

External Recognitions

2024: Fellow, Indian National Science Academy (INSA)

2024: Ambassador, International Society of Service Innovation Professionals

2023: Honorary Life Member, Royal Society of Chemistry, UK

2022: Fellow, IET (Institution of Engineering and Technology, UK)

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2021: Member, National Academy of Engineering (NAE)

2021: Honorary Member, Society for Imaging Science & Technology

2019: Member, Advisory Board of ISSIP

2014: Board Director, FuzeHub at NYS-ESD-NYSTAR

2013: Industrial Fellow, Center for Innovation Management Studies at NCSU

2013: Honorary Fellow, Punjab Science Congress/Indian Academy of Sciences

2011: *Santokh Badesha Leadership Scholarship Established by Clarkson U*

2011: Fellow, Society for Imaging Science & Technology

2010: Member, Advisory Board of Saunders College of Business, RIT

2009: Chester F Carlson Lifetime Achievement Award of Society for Imaging S & T.

2009: Represented Xerox at White House to receive National Medal of Honor.

2007: Honorary Doctor of Science *from Clarkson University*

2004: Chartered Scientist of The Science Council, UK

1997: Distinguished Inventor of the Year Award, Rochester Intellectual Property Law Association

1997: Proclamation by the Mayor, Rochester, NY

1985: Fellow, Royal Society of Chemistry, UK

Value Proposition of Intellectual Property

- *[“As I add the figures of demonstrated value add to Xerox from his teams alone, not even counting the value on his patents. I would not be surprised if this is one of the **top ten all time highest** contributions from a single technical contributor over the course of his/her Xerox career” (Charlie Duke, 5/23/2003)].*
- *(“The all-time Xerox recordholder for U.S. patents, Dr. Badesha has generated patented technology that is used in nearly all major Xerox printing system families, including DC6000/8000/5065/iGen (process color), Docutech/Nuvera (B&W), 4135MX/6185MX (bank check printing), ColorCube/Cipress (Solid Inkjet), and Xerox® Baltoro™ HF Aqueous Inkjet Press constituting core business revenue measure in the \$100sM over the years and supporting tens of thousands of jobs in US and globally” (Steve Bandrowczak, Xerox CEO, 5/05/2022))*

The National Medal of Technology: 2007



**Dr. Santokh S. Badesha and Xerox CEO
Ms. Ursula Burns at the White House**