

Mission-Enabling Innovation



Tommy Gardner, Ph.D., PE
Chief Technology Officer
ManTech International
Technical Services Group
October 20, 2010

ManTech
International Corporation®

Leading the Convergence of National Security and TechnologySM



Innovation

- What is Innovation?
- Product and Process Innovation
- Incremental vs. Radical Innovation
- The Mind Set of Innovation
- The Structure of Scientific Revolutions
- We have no money, therefore we must think
- Supply Chain Mission-Enabling Innovation

Innovation

- Motivation = the stuff that permeates your entire being, when you have a clear, vivid picture in your mind of what you want and an intense burning all consuming desire in your heart to fight for it.
- Innovation = ?

An innovation is one of those things that society looks at and says, if we make this part of the way we live and work, it will change the way we live and work.

Dean Kamen

Wiki Definition

- **Innovation** is a change in the thought process for doing something, or the useful application of new inventions or discoveries.^[1] It may refer to an incremental emergent or radical and revolutionary changes in thinking, products, processes, or organizations. Following Schumpeter (1934), contributors to the scholarly literature on innovation typically distinguish between invention, an idea made manifest, and innovation, ideas applied successfully in practice.



Innovation

- Innovation = an invention that is enabled in the marketplace creating economic value

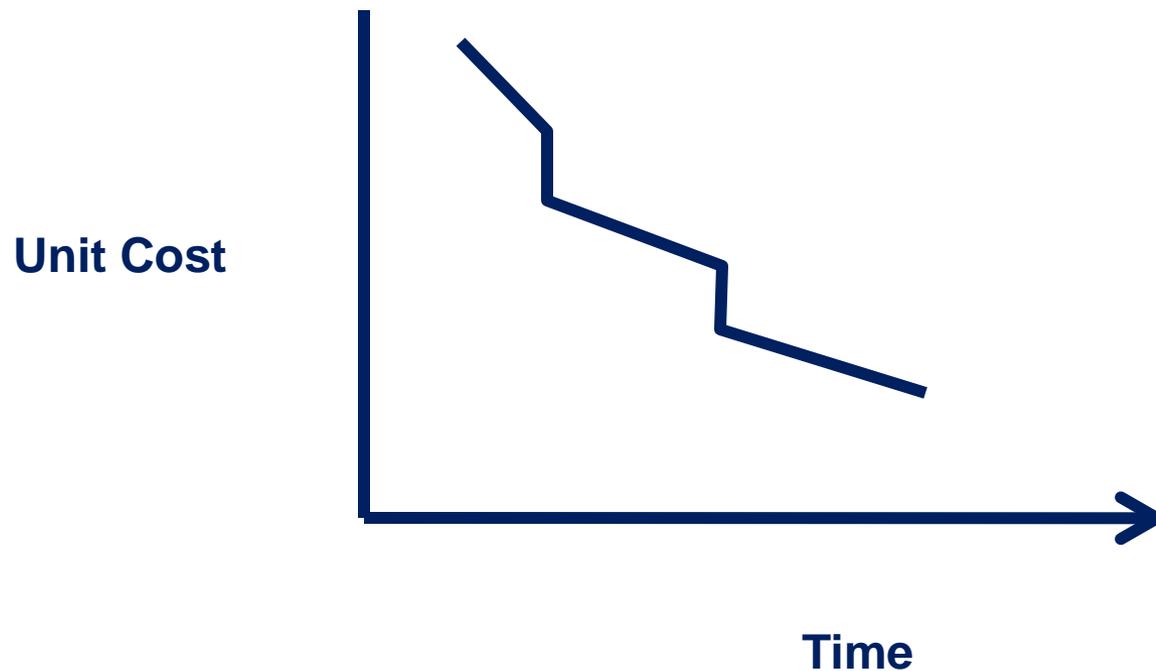


Product vs. Process Innovation

- Steam Relief Valve – Labor Saving Device
- Hold your Horses – Resistance to change
- Gunfire at Sea – New ways are hard to accept
- Pilkington Glass – Cost Saving Process
- Bessemer Steel Plants – Better Properties
- Cotton Gin – Labor Savings
- Interchangeable Parts – Reducing Variance
- FedEx

Incremental vs. Radical Innovation

- Evolutionary vs. Revolutionary
- Disruptive Technologies





The Mind Set of Innovation

- Galileo's Daughter
- Joseph Schumpeter's Creative Destruction
- Business Improvisation
- Humans: Why They Triumphed



“The Structure of Scientific Revolutions”

- Thomas Kuhn’s 1962 book titled above followed his study on Copernicus. Here he introduced the term “paradigm shift” to describe what happens when observable data does not fit the current theory causing a crisis in the field.
- Much debate over the last 50 years over whether Kuhn’s work applies to fields outside of Science. Kuhn says it probably does not.
- What does apply is the friction of the resistance to change within a community against new ideas. In each “revolution” there is a Tipping Point”.



We have no money

- During the Cold War Russian Scientists often had little to no research funding.
- They became excellent mathematicians and theorists, because they didn't have the large computers or expensive lab equipment.
- Their motto in technical exchanges became, "Because we have no money, we must think."



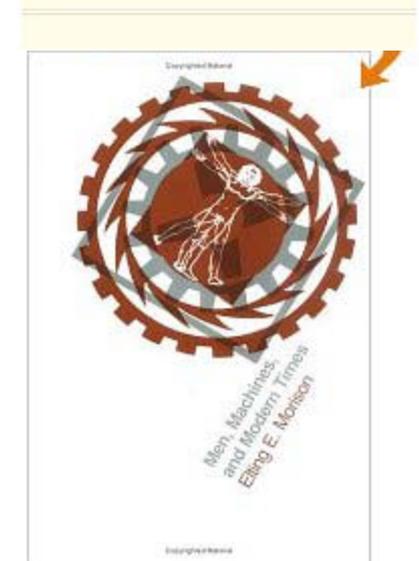
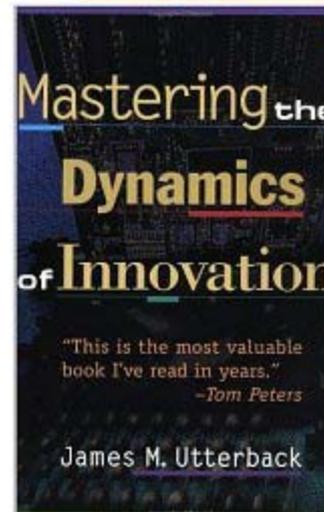
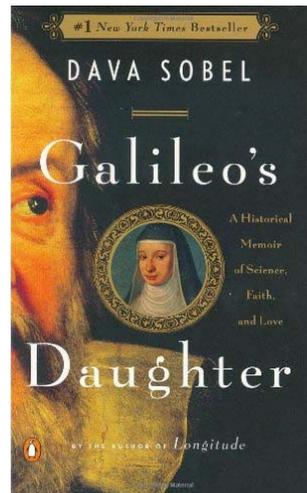
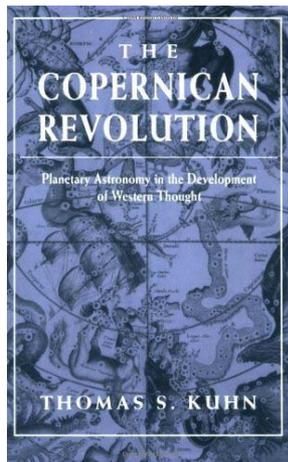
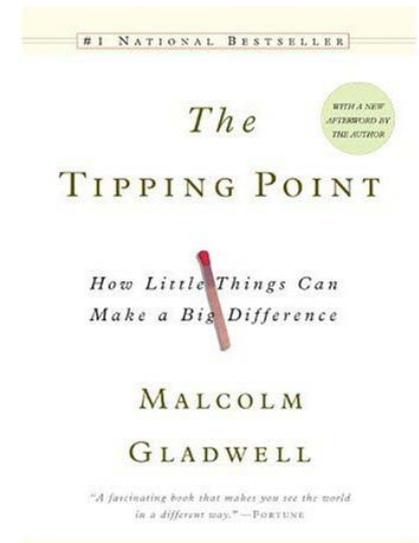
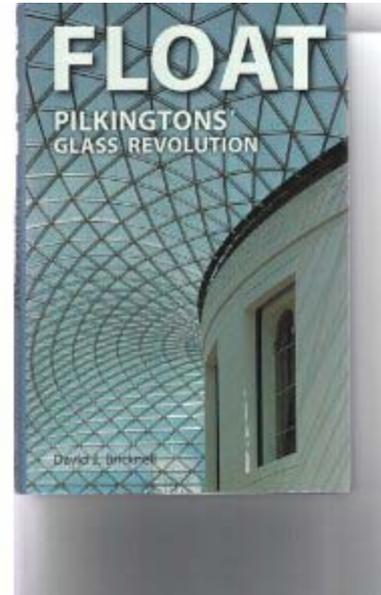
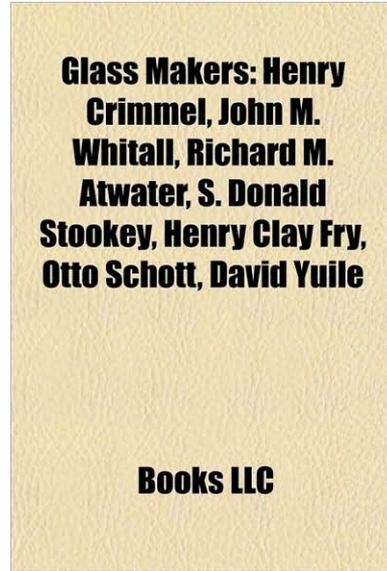
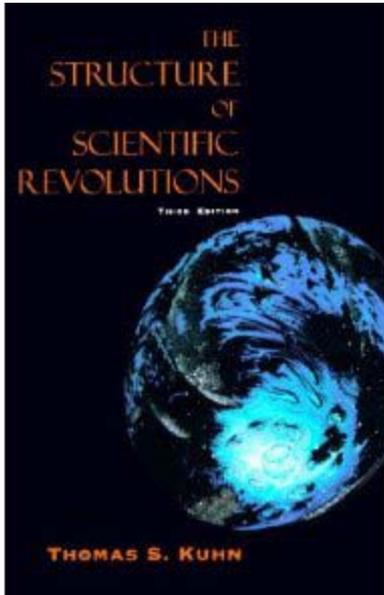
Supply Chain Mission-Enabling Innovation

- Logistics Transformation
 - SCM is one facet of logistics
 - Each facet is increasingly digital
 - Information Management, Total Asset Visibility, Condition Based Maintenance, Obsolescence Management are all inter dependent
 - Your digital tools open up new way to manage, process and understand information



BACKUP

Books of Interest



Books on Amazon

- [ORIGINAL PATENT APPLICATION NUMBER 316,354 FOR IMPROVEMENTS IN OR RELATING TO THE PRODUCTION OF GLASS IN STRIP FORM AND APPARATUS THEREFOR \(LIVERPOOL\).](#) by Pilkington Brothers Limited & Ernest Bristow LeMare. (Hardcover - Jan 1, 1929)
- [ORIGINAL PATENT APPLICATION NUMBER 378,517 FOR PROCESS AND APPARATUS FOR SCORING AND SNAPPING FLAT GLASS AUTOMATICALLY. \(LANCASTER\).](#) by Pilkington Brothers Limited and Frederic Barnes Waldron. (Hardcover - Jan 1, 1931)
- [ORIGINAL PATENT APPLICATION NUMBER 983,805 FOR IMPROVEMENTS IN BENDING GLASS SHEETS \(PITTSBURGH\).](#) by Pilkington Plate Glass Company.
- [ORIGINAL PATENT APPLICATION NUMBER 1,383,202 FOR IMPROVEMENTS IN OR RELATING TO GLASS CERAMIC MATERIALS \(LIVERPOOL\).](#) by Stanley Lythgoe & Philip Sidney Irlam. Pilkington Brothers Limited
- [ORIGINAL PATENT APPLICATION NUMBER 1,383,201 FOR IMPROVEMENTS IN OR RELATING TO GLASS CERAMIC MATERIAL \(LIVERPOOL\).](#) by Pilkington Brothers Limited.
- [ORIGINAL PATENT APPLICATION NUMBER 1,357,116 FOR CUTTING OF GLASS \(LIVERPOOL\).](#) by Pilkington Brothers Limited et al.
- [ORIGINAL PATENT APPLICATION NUMBER 407,407 FOR IMPROVEMENTS IN GLASS GRINDING APPARATUS \(LIVERPOOL\).](#) by Pilkington Brothers Limited Frederic Barnes Waldron.&
- [ORIGINAL PATENT APPLICATION NUMBER 296,096 FOR IMPROVEMENTS IN THE GRINDING AND POLISHING OF PLATES OF GLASS IN CONTINUOUS GRINDING AND POLISHING MACHINES. \(LIVERPOOL\).](#) by Pilkington Brothers Limited.
- [ORIGINAL PATENT APPLICATION NUMBER 408,648 FOR AN IMPROVED METHOD OF AND APPARATUS FOR TEMPERING GLASS \(LIVERPOOL\).](#) by Pilkington Brothers limited & James Meikle.
- [ORIGINAL PATENT APPLICATION NUMBER 847,892 FOR IMPROVEMENTS IN OR RELATING TO THE SEPARATION OF SECTIONS FROM A RIBBON OF GLASS. \(LIVERPOOL\).](#) by Pilkington Brothers Limited.
- [ORIGINAL PATENT APPLICATION NUMBER 1,500,207 FOR IMPROVEMENTS IN OR RELATING TO BREAKING FLAT GLASS INTO CULLET. \(MERSEYSIDE\).](#) by Pilkington Brothers Limited.