Reducing ChE Fundamentals to Practice – Career pathways in Industry

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Outline

- Genesis of this talk
- Industry trends
- Challenges faced by Industry today
- Expectations of Supply Side (new entrants into the industry)
- Value enhancing tools
- Strategy (ies) towards successful careers in Industry
- Leadership qualities
- Recap
Industry Trends

- Globalization
- Environmentally sustainable solutions:
  - Energy
  - Material development
  - Food production
- Cost-out/Productivity
- Product Vitality index
- Core competencies – Leverage Value chain

Where does ChE fit in these mega-trends?
Challenges faced by Industry

- Talent acquisition
- Top Line (Revenue) & Bottom line (Profitability) growth
- Vitality Index – Income from new products
- Reluctance/Inability to respond to Change

How do you address these challenges?
Expectations of Supply side (new entrants)

Trends + Challenges = Expectations

- Alignment with Company Vision.
- Learn skills on the job and apply effectively.
- Experience & skill set matches job requirements (conundrum for entry level candidates).
- Be effective team players.
- Lead projects involving multiple functions without direct reports.

• Research your target company
• Is this a good company in a good industry?
• Is it a good company in a weak industry?
• Can it sustain itself?
Leverage ChE Fundamentals

- Define the Problem
- Process Map the system – Start with block diagrams
- Understand Inputs (Independent variables) and Outputs (Dependent variables)
- Develop/Understand Mass Balance – 80-90% of projects
- Develop/Understand Energy Balance – 40-60%
- Is there a Chemical Reaction? Type and Order of reaction? – 10-30%
- Understand heat transfer – 25-50%
- Understand Mass transfer – 15-30%
- Understand Environmental, Health, & Safety concerns – 100%

- Understand your fundamentals – they define you!
- Ask questions – shows thought process not ignorance!
Value Enhancing Tools

- Six Sigma & Lean methodologies — Quality & Cost
- Design of Experiments – Mixture and Factorial – Vitality Index
- Financial analysis – NPV, DCF, ROA, etc — Growth & Investments
- Business tools – SWOT, FMEA, etc - Change

With experience consider:

- MBA, JD/Patent Law – enhances profile/change career
- Topical courses to revitalize career interest

Continuous learning is a key to enhance one’s entitlement
Basic Ingredients defining a Job

- Gain experience via Co-Ops and Internships at Undergraduate & Graduate levels.
  - Refine thoughts by volunteering to teach/present findings.
  - Experiences are a learning process…not a check mark to success!
- Alignment of **Values and Beliefs** are critical to offset the “Experience” factor.
Mapping your career

Application, Passion, and Energy determine your entitlement!
Potential Strategy to a successful career

- Define your goals and objectives
- Research your target company
- Initially try putting less weight on $$ and more on learning and experience.
- Learn and develop tools that serve Company’s Vision and Mission.
- Make sure you have a buddy and a Mentor.
- Understand the organization
- Do a great job to get multiple sponsors
A Janitor’s Ten Lessons in Leadership

By Col. James Moschgat, 12th Operations Group Commander

• Be Cautious of Labels
• Everyone Deserves Respect
• Courtesy Makes a Difference
• Take Time to Know Your People
• Anyone Can Be a Hero
• Leaders Should Be Humble
• Life Won’t Always Hand You What You Think You Deserve
• No Job is Beneath a Leader
• Pursue Excellence
• Life is a Leadership Laboratory
William John Crawford  
May 19th 1918 ~ March 15th 2000  

Bill Crawford was born in Pueblo, Colorado. He is one of four Medal Of Honor recipients from that city. During World War II, after destroying two machine gun nests, Bill was taken prisoner by the Germans. While in captivity, he survived a 52-day, 500-mile winter march. He was reported missing in action and presumed dead by the U.S. Army. Bill's father accepted the Medal Of Honor for his son from President Franklin Roosevelt in 1943. Forty-one years later, President Ronald Reagan presented the Medal Of Honor to a very much alive Master Sergeant Bill Crawford at the US Air Force Academy on May 31, 1984. Following the war, Bill married Eileen Bruce on January 13, 1946.

Birth: 
May 19, 1918 

Death: 
Mar. 15, 2000 

**World War II Congressional Medal of Honor Recipient.** He was a Master Sergeant in the US Army. He was awarded the Medal of Honor as a Private in 3d Platoon, Company I, 3d Battalion, 142d Infantry, 36th Infantry Division for action near Altavilla, Italy on September 13, 1943. He was a POW. His citation reads in part "When the platoon, after reaching the crest, was once more delayed by enemy fire, Pvt. Crawford again, in the face of intense fire, advanced directly to the front midway between two hostile machine-gun nests located on a higher terrace and emplaced in a small ravine. Moving first to the left, with a grenade he destroyed one gun emplacement and killed the other and with one grenade and the use of his rifle, killed one enemy and forced the remainder to flee. Seizing the enemy machine gun, he fired on the withdrawing Germans and facilitated his company's advance." (bio by: Don Morfe)