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# **Administration/Management Philosophy and a Vision for the Mechanical Engineering Program at TAMUQ**

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**Bruce Chehroudi, PhD**

A Presentation at  
Department of Mechanical Engineering  
Texas A&M University at Qatar  
Doha, Qatar

June, 19, 2012

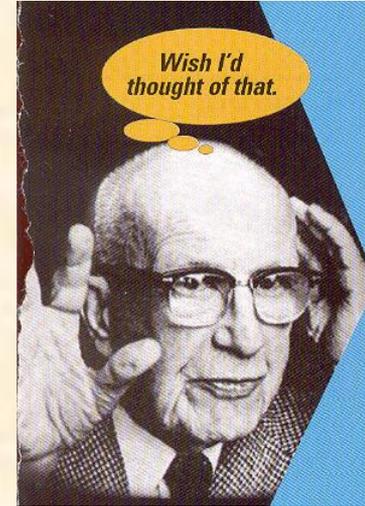
# My Philosophy in a Nutshell

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*"Advances in the various fields of human endeavor are due, to a large extent, to the cooperation of the best brains and best talents available everywhere"*

*Thomas J. Watson Jr*



*"The work of the individual still remains the spark that moves mankind ahead, at times, even more than teamwork"*

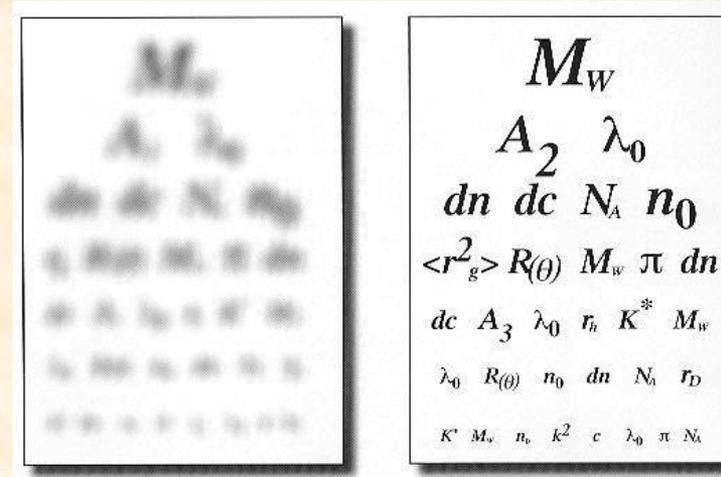
*Igor Sikorsky*

# TAMUQ's Mission and Vision

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## Mission:

- Texas A&M University at Qatar will:
  - Develop *exemplary engineers* and *leaders* through *internationally-respected* undergraduate and graduate degree programs.
  - Generate *new knowledge* by conducting *research* and disseminating results.  
Serve the needs of the *State of Qatar* and the *region* through broad expertise.



## Vision:

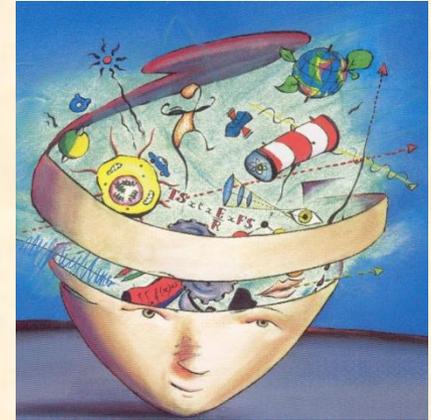
- Texas A&M University at Qatar will
  - Be the *premier provider* of engineering education in the region,
  - a *valuable contributor* to knowledge internationally, and a valued resource to the *State of Qatar*.

# Administrative Philosophy

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- **Transparency:**

- Transparent and communicative on budget, course scheduling, and planning
- Demonstrate fiduciary responsibility
- Shared governance

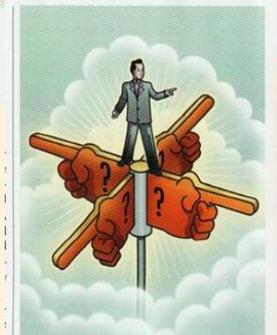


- **Strategic planning**

- Important administrative responsibility
- Stay focused on long-term goals
- Must seamlessly interface with TAMUQ's Strategic goals
- Should incorporate the creativity of the faculty (true shapers of the university)

## STRATEGY

Asking the Right Questions



# Administrative Philosophy

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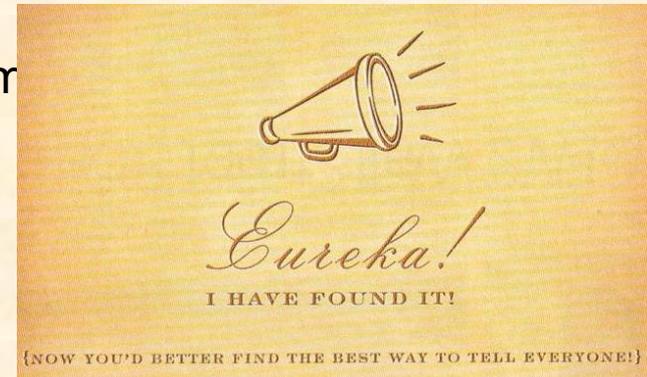
## • Collaboration

- Rely on collaboration
  - With faculty, staff, admin, student, alumni, agencies, constituency groups, and public
- Believe that 1+1 is more than 2 !
- Foster existing collaborations and develop new ones
- Shared governance



## • Innovation

- Actively initiate innovation to improve the program
- Changes are guided to sustain innovative and exceptional program
- Open to realistic opportunities promoting individuals
- Promote innovation by faculty and staff
- Status quo is not enough



# Administrative Philosophy

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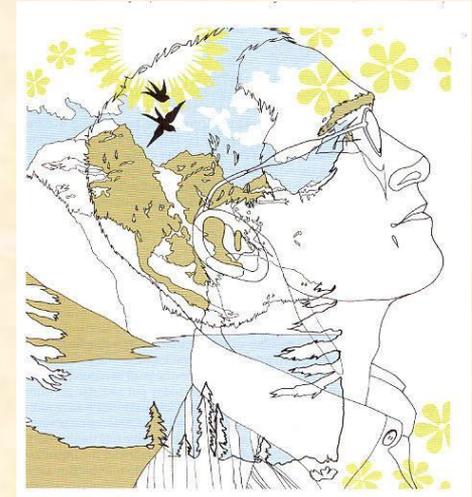
## • Mentorship

- Embrace with commitment and passion
- A responsibility of all faculty and staff
- Is considered as an opportunity to assist leadership development
- Engage in mentoring and encourage faculty/staff to do so



## • Vision

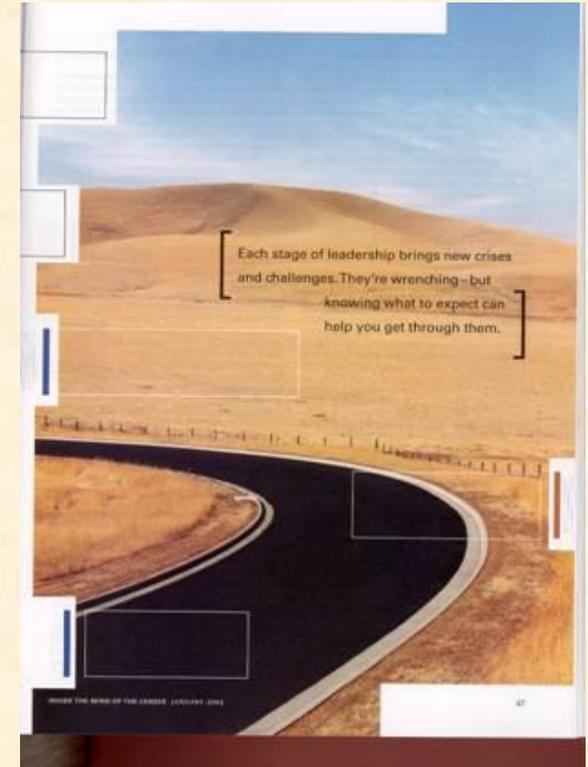
- A visionary
- Share TAMUQ's vision with others
- Inspire others to promote TAMUQ's vision
- Seek opportunities to expend its significance into the future



# Leadership Style

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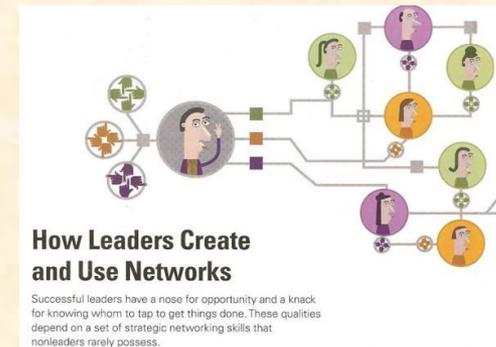
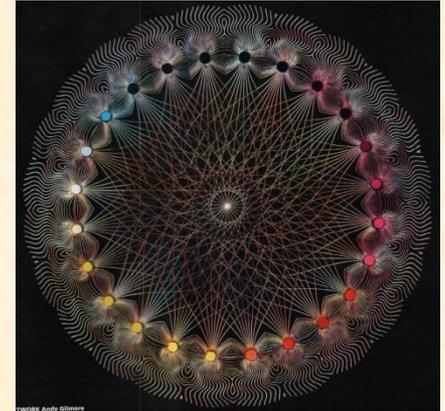
- Lead through a framework of consensus-building, strategic planning, transparency, and walking the talk
- Guide the program with fair, ethical, and consistent governance to meet the needs of students, staff, faculty, university, public, and the State of Qatar



# Key to Effective Leadership & Management

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- Ability to work with people
- Building relationship, expanding network based on
  - Trust
  - Respect
  - Open honest communications
- Good listener
- Address hard questions
- Make informed decisions



# The Recipe for Organizational Success (no matter where)

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Source: Chehroudi, B., 2012. *R&D Management*, ASME Publication.

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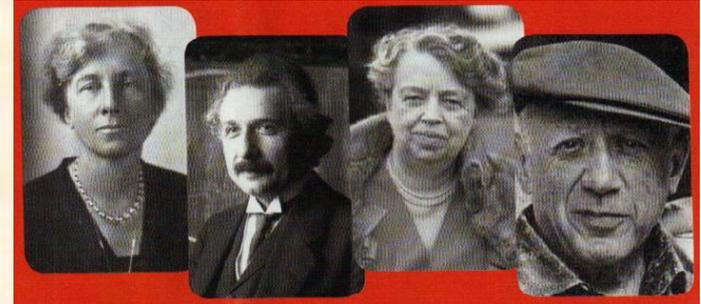
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# The 21<sup>st</sup> Century Engineer and Engineering Education Needs

# What Skills Do Engineers Need to Pursue?

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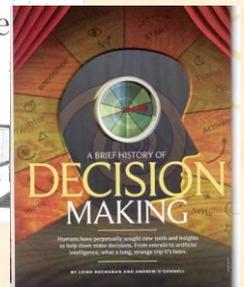
- **National Academy of Engineering** (*The Engineer 2020*): “... will aspire to have the **ingenuity** of [ergonomics inventor] Lillian Gilberth, the **problem-solving** capabilities of [Intel cofounder] Gordon Moors, the **scientific insight** of Albert Einstein, the **creativity** of Pablo Picasso, the determination of the Write brothers, the **leadership** abilities of Bill Gates, the **conscience** of Eleanor Roosevelt, the **vision** of Martin Luther King, **entrepreneurial** character of Steve Jobs, and the **curiosity** and wonder of our grandchildren.”
- **A survey on ME alumni between 1992 to 1996 (MIT)**: They seldom used the underlying math, thermo, and other knowledge they learned in core ME classes— but regretted having learned little about **teamwork** or other pervasive on-the-job practices
- **21<sup>st</sup> century Engineers and Engineering Technologists**: conceive, design, realize, operate, maintain, and retire systems (products, processes, or services) that transform the form, state, or location of matter, energy, and information



# What Skills Do Engineers Need to Pursue?

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- **National Academy of Engineering (The Engineer 2020):**
  - Ability to apply engineering processes to large- and small-scale problems of importance to human health and welfare (**Practical ingenuity**).
  - Strong emphasis on so-called **“soft” or “professional” skills** (interpersonal and management skills)
  - Must **communicate** well enough (orally, electronically, and in writing) to sell clients, bosses, or a diverse group of teammates on an idea
  - **Leadership** and **decision making** to foster **creative solutions** to such global “grand challenges” as energy, climate changes, etc.
  - A strong **moral compass**, **ethics**, **culture awareness** and ability to **apply engineering concepts** across the disciplinary spectrum

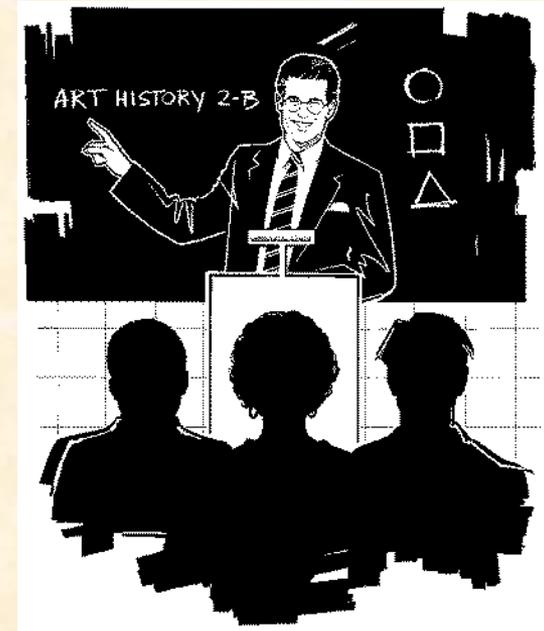


Reports issued in Australia, New Zealand, Thailand, India, and United Kingdom, and by the African Network of Scientific and Technological Institutions have all urged the “reform” of engineering education to better incorporate “professional” skills.

# Teaching Assessment and Effectiveness

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- **Teaching must be effective. How do we know?**
  - **William Lucas (MIT):** Close relationship between an undergraduate's course of study, instructor feedback, and frequent interaction with an industry-based role model increased a student's confidence in launching new technological ventures
- **Assessment**
  - **The field-tested Learning Assessment Guide (NSF support):** gathers and catalogues classroom assessment techniques that emphasize capturing the ability of students to think analytically and to understand and communicate at both detailed and "big picture" levels
  - **Concept inventories:** short but profound assessments that seek to determine a student's most fundamental understanding of technical concepts (see Dynamics Concept Inventories by DCI Team in PSU)



# Conceive, Design, Implement, and Operate (CDIO)

- **Launched in late 1990s, it brings together many of the elements of effective instruction, skill-building, and practice ([www.cdio.org](http://www.cdio.org)):**
  - Core syllabus, course materials, tools, models, and templates, as well as assistance with implementation in 25 countries
  - Standards-based tool for program adoption, evaluation, and continuous improvement
  - National Academy of Engineering recognized CDIO's valuable contributions by bestowing the Bernard Gordon Prize for Innovation in Engineering and Technology Education on its founder, MIT professor *Edward Crawley*
  - *The initiative has been a global success*



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# The TAMUQ Strategic Plan



# Contributions to TAMUQ's Strategic Plan

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## • Working Life Environment

- Transparency
  - [a pillar of my administration]
- Employee growth and development
  - (trainings, certificates, licenses, etc.)
- Recognition of accomplishments and innovations
  - [understand its impact/importance]
- Satisfaction
  - (morale, mentorship, social activities)



## • Continuous Improvement and Assessment

- SACS and ABET accreditation process
  - [as a faculty and a consultant]
- Performance evaluation
  - [numerously done]
- Institutional research and effectiveness
- Rapid response through Strategic Plan amendments



Assuring Quality • Stimulating Innovation



Southern Association of Colleges and Schools  
Commission on Colleges

# Contributions to TAMUQ's Strategic Plan

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## • Shared Governance

- Inform and encourage active participations
- Seek input from constituencies (students, faculty, staff, alumni, etc.)
- Methods of effective assessments of inputs



## • Teaching and Learning

- Enhance student intellectual development
- Promote excellence in teaching
- Increase design and research opportunities for students
  - [Thermal system, CDIO, etc.]
- Strengthen the University's presence nationally and internationally through teaching and learning
  - [Broad national and international network]
- Develop student participation and leadership in relevant technical fields
  - [R&D Management, SAE/AIAA, etc.]



# Contributions to TAMUQ's Strategic Plan

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## • Research

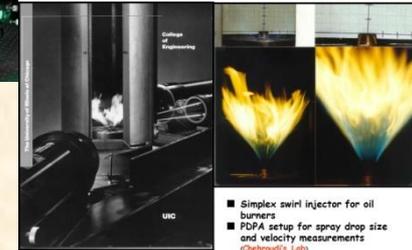
- Graduate degree program
- Infrastructure support
  - (Qatar Foundation, local sources, etc.)
- Local, regional, and international collaboration
- Centers of excellence
- Develop unique technical facilities

## • Engagement

- Lifelong learning
  - (continuing education, training, conference, seminars, professional societies, public lectures, etc.)
- Outreach
  - (K-12 education support, enrichment programs, engineering extension services, consulting services, facilities, etc.)
- Community services
  - (student service-learning initiatives, faculty participation/volunteering service to community)



Liquid Atomization, Sprays, and Fuel Injection



Meet the winner of the Flame Challenge!



# Contributions to TAMUQ's Strategic Plan

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## • Student Life Experience

- Student org, clubs, events, and activities
- Develop leadership skills
- Student counseling and wellness programs
- Supplemental/developmental tutorial instructions
- Global experience
  - (study abroad, conference, poster session, cultural/leadership, etc.)
- Foster gender collaboration
- Enhance number & size of scholarship to non-Qatari students
- Expand recreational and study spaces



**The Real  
Leadership  
Lessons<sup>®</sup> of  
Steve Jobs**

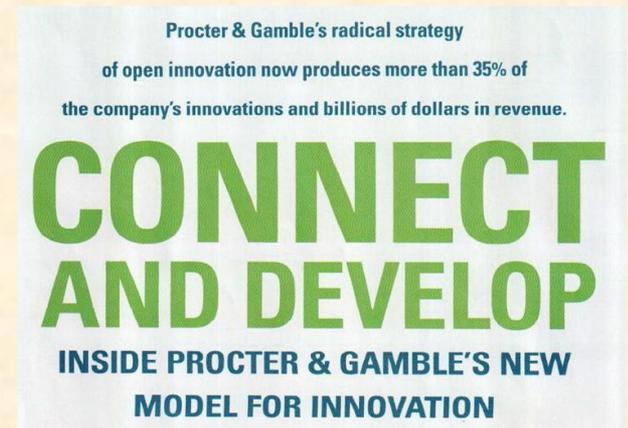
Six months after Jobs's death, the author of his best-selling biography identifies the practices that every CEO can try to emulate.  
by Walter Isaacson

# Contributions to TAMUQ's Strategic Plan

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## • Development

- Hire a director of development
- External funding for
  - scholarship-fellowship
  - employees and students (travel, lectures, conference, etc.)
  - laboratory/facility
  - faculty chairs, distinguish professorship, etc.)
  - scholars, eminent engineers, prominent business leaders/innovators/entrepreneurs)
  - discretionary account
  - enhancing women, minorities, and underserved constituencies' educational experiences
- Develop “donor-named” programs
- Regional initiatives to engage Aggies & regional corps towards TAMUQ mission/vision



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# The End



# Thank you