Development of Leadership Skills in Engineering Employment

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The Art of Professional Engineering: Planning your career

• The path to management

• Becoming a leader

• The holistic engineering career
The Path to Management

- **First phase**: technical specialization, developing personal expertise
- **Second phase**: progressively acquiring team responsibilities on a broader basis
- **Third Phase**: taking charge of a team
Managing What?

People: Team, group, section, division

Resources: Hardware, software, services

Finance: Cash flow, budgeting, accounts

Projects: Research, development, prototyping
Managing People

• **Understanding** what makes you and your colleagues ‘tick’

• **Personality types** (Briggs-Meyer classification, introvert/extrovert, etc).

• **Team building** (technical, support and ancillary staff)
Managing Resources

• Research and design skills

• Technical infrastructure (CAD, measurement equipment, test facilities, etc.)

• Intellectual property (internal/external)

• Establishing priorities for the allocation of resources
Finance

• Planning

• Management accounting

• Budgets (financial controls and auditing)

• Cash flow (business plan/model)
Managing Projects

- Internal (company) and external (customer) constraints
- Preparing proposals
- Allocation of resources to specific tasks
- Assigning tasks to team members
Responsibilities to the Team

Career development and training of young graduate engineers, technicians, etc.

Performance reviews at regular intervals

Building effective teams
Becoming a Leader

• Preparation for a leadership role (looking for mentors)

• Identifying role models

• Your evolving career plan
Leadership Skills

Questions:

• Can they be learned, or are they ‘natural from birth’?

• Is experience the best way to acquire leadership skills?

• Can the example of a good leader inspire others to develop their skills?
The Holistic Engineering Career

• Technical skills are only one part of the portfolio that you will need. A broad knowledge of the technology and the market becomes essential.

• During the early part of a career a wide range of complementary skills need to be acquired

• It is the mastery of these skills that is a major factor in determining your progress to the top of your profession
Complementary Skills

• Language skills, especially verbal
• Technical writing
• Public speaking and presentational skills
• Leading and conducting meetings
• Communication skills
Distinctions between Leadership and Management

• **Managers rule…**
  Managers acquire power by virtue of their position: their authority comes from their role in the company

• **Leaders are followed…**
  Leadership involves power by influence: authority is inherent in character and style

Wikipedia
Leadership and Management are different:

- **Leadership** is exhibited when one attempts to influence the behavior of an individual or group, regardless of the reason.
- **Management** is an organizational process in which the achievement of specified goals is paramount.

*Hersey and Blanchard*
The best **Leaders** are inspiring visionaries, with flair and attractive personalities. They are concerned about substance and people, always aiming to take advantage of new opportunities. They are masters in the art of emotional intelligence and they apply it in order to get the best out of each member of the team.

**Managers** are planners, concerned about process and tasks, aiming to minimize downside risks. They typically follow and help to realize a leader’s vision.
…but in practice what are their tasks?

- **Manager**
  - Organizing
  - Planning
  - Budgeting
  - Staffing
  - Directing
  - Controlling
  - Problem solving

- **Leader**
  - Setting a direction
  - Aligning people
  - Motivating and inspiring
  - Problem solving
Summary

- Leadership skills are more behavioural in nature and require a broad background knowledge of the work environment.
- Management is a more focused activity, concentrating on the problem in hand, using skills that can be acquired, for example, through continuing education.

• coach4growth.com
Leadership vs. Expertise

• An expert can become a leader but might not be temperamentally suited to the role.
• Good leaders are often not true experts, but they need a broad understanding of the relevant technical field and the market.
• A leader provides direction and motivation.
• Experts are invaluable to technology companies, especially for creating intellectual property.
• To be a fully rounded manager you need to have the ability to schedule tasks, assign responsibilities, and deliver results. But, these management skills on their own, without the support of strong leadership, could leave you unable to fully motivate your team and produce the results you are trying to achieve.

• To be an inspiring and effective leader you need to be able to convince your team of the merit of the goals being pursued. But, leadership skills alone, without the presence of effective management, could leave you without the capability to fully realize your vision.
Further reading

• There are many good sources of guidance on the art of leadership, especially in the IEEE library of continuing education.

• There are many excellent books, such as Stephen Covey’s ‘The Seven Habits of Highly Effective People’
    Lin Bothwell’s ‘The Art of Leadership’