Professional Competences beyond Technical Know-How: A Perspective from a Technology Company

Should Innovation Training at the University be Oriented to Teach Students About Market Competences or They Just Train Entrepreneurs?

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Fractus – A High-Tech Company

Fractus was founded in Barcelona in 1999 to develop and market Fractal Antenna technology.
“To become a global reference antenna partner in selected markets by supplying our technology and IP through an excellent organization.”
Product & License Business Flowgraph

MARKET DEMAND

Market Surveillance

Product Marketing

PRODUCT SALES

DFM & Qualification

PRODUCT DESIGN

Feasibility Analysis

PROTOYPE

Proof of Concept (Experiment) & Conceptualization (Invention Report)

Innovation Conception (IDEA)

Technology Trends & Market Needs

Prior-Art Surveillance

Patent Prosecution

IP Product License

Licensing Patent Preparation

PATENT APPLICATION

Provisional Patent Application

Technology & Patent Engineering Know-How

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Fractus team is 36 people.

> 50% are in R&D.

> 70% have an Engineering/Technical Background

4 Ph.D. in R&D and IP

5 Professional Levels have been established.

3 Different Carreer Paths:

- Expertise
- Management
- Sales
Fractus has identified 12 essential competences for its team members:

- Only 1 is directly related to the technical background (Know-How)
- At least 2 are related to market skills (Business Awareness and Customer Focus)
- Only 4 have relation to traditional engineering curricula:
  - Know-How
  - Problem Solving
  - Innovation
  - Achievement – Results Orientation

Who is to provide training on the other 8?
• Professiograms look similar at the top (level 5).

• A balance in all skills are essential to progress in the career path.

• Excellence in a wide range of competences are crucial for a healthy growth of the company and its professionals.

• An Engineering curricula should facilitate the future development of all essential skills.
Innovation: Bridging the Gap

Bridging the gap between knowledge areas generates new exciting opportunities.

Diversified and ‘cross-discipline’ curricula stimulate creativity, innovation and entrepreneurship.

A spark is created when two isolated and charged poles are put close together.
Steve Jobs dropped\(^1\) a traditional university program and started to attend any lectures that were of his interest. During his ‘self-made’ curriculum he took a TYPOGRAPHY course and became fascinated by fonts. He ‘embedded’ that know-how in first Apple Macintosh computers, which have been a key driving factor for the success of Apple among, for instance, editors and graphic designers.

\(^1\) Steve Jobs, Stanford Commencement Speech 2005
http://es.youtube.com/watch?v=D1R-jKkp3NA
Professional Competences

Innovation should be seen as a means to improve, not an objective by itself,

**Market** awareness is **essential** to guide innovation and entrepreneurship.

Without market feedback, **creativity alone** can take you anywhere.
SOME ‘OVERTRAINED’ TOPICS IN ENGINEERING SCHOOLS:

- Math Theory
- Scientific Method
- Mathematical Demonstrations
- Problem Analysis (as opposed to problem solving).
- ...

SOME ‘UNDERTRAINED’ TOPICS IN ENGINEERING SCHOOLS:

- Marketing and Sales
- Customer Focus / Relationship
- Communication Skills
- Teamwork
- Business Awareness
- Project/Team Management
- Leadership
- Conflict Management
- Negotiation
- Psychology / Sociology
- ...

About Engineering Education ...