

EU/US Research and Education Workshop

Session 2 : Innovative Curricula for R&D

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R&D profiles are different...

- R&D in Academia

- **Educates nearly all scientists & engineers**
- Freedom
- Driven by individual's curiosity with *worldwide competition*
- Extends the range of what's possible
- Designed as a knowledge driven ecosystem, adaptative on the long term
- Decentralised and well connected
- Publishes fast and spread results worldwide
- Shares knowledge

- R&D in Industry

- **Recruits main fraction of educated scientists and engineers**
- Discipline
- Driven by collective processes with worldwide competition
- Extends the range of reality
- Designed as a profit based « war machine » - projects driven, adaptative on the short-mid term
- Mainly decentralised and hardly connected
- Protect fast and keep proprietary knowledge local
- Trades knowledge

Context awareness is a never ending challenge...

Success factors

"Some chemists, who have little experience with industrial enterprises, are over-inclined to judge a chemical process exclusively from the standpoint of the chemical reactions involved therein, without sufficient regard to the engineering difficulties, financial requirements, labor problems, market and trade conditions, rapid development of the art involving frequent disturbing improvements in methods and expensive changes in equipment, advantages or disadvantages of location of the plant, and other conditions so numerous and variable that many of them can hardly be foreseen, even by men of great experience.

And yet, these seemingly secondary considerations become deciding factor for success or failure of an otherwise well-conceived chemical process."

From "Some Aspects of Industrial Chemistry – The Chandler Lecture" by Leo Baekeland - 1914

What's needed goes beyond boundaries of S&T

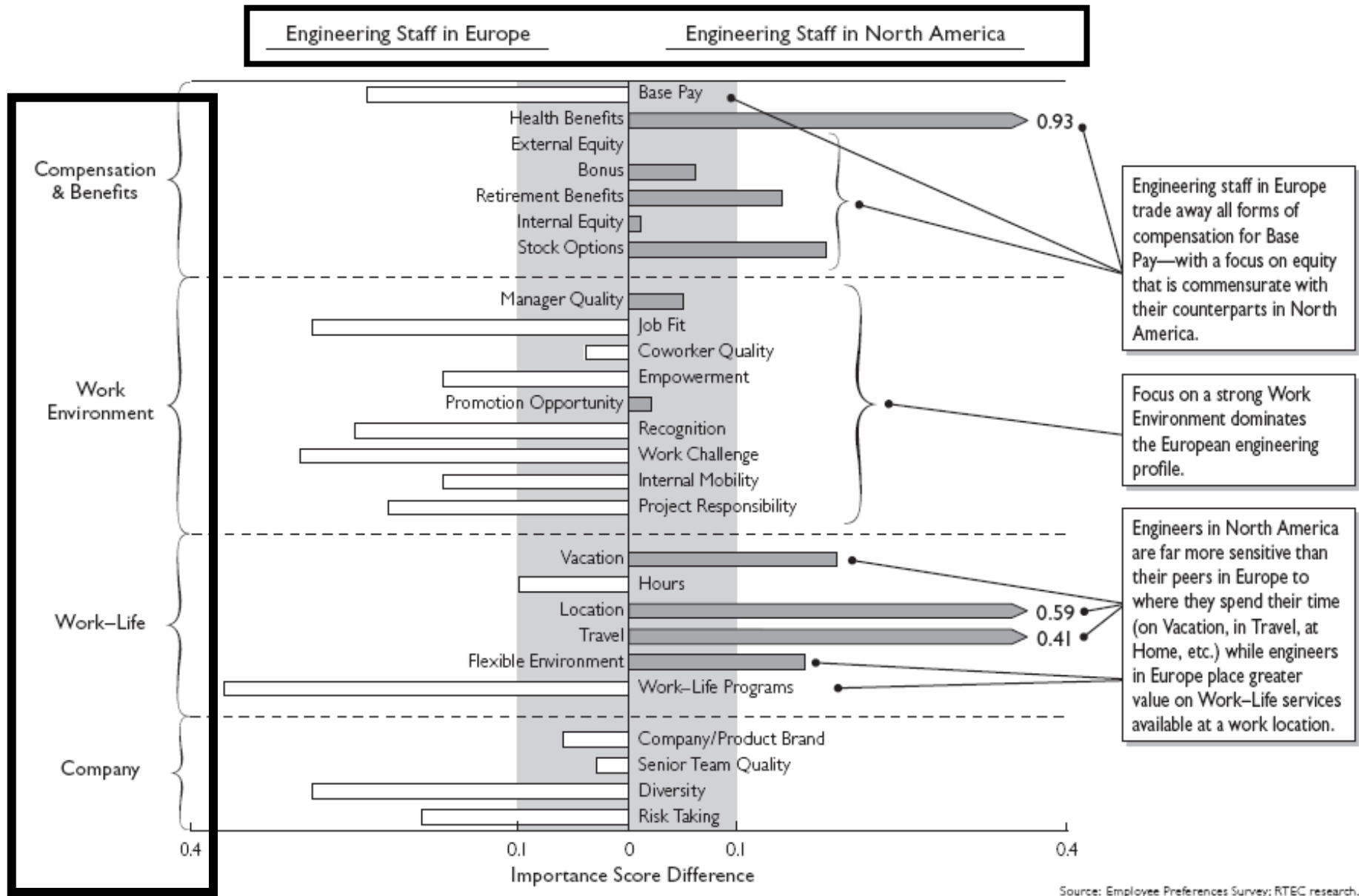
Primary Capability Challenges Facing the Industry between 2008 and 2020



A multiplex workforce enables the diversity of skills and culture, and unites them into common goals and direction

Sources: IBV Analysis, Automotive 2020 Global Interviews (n=103),

The Cross-Continental Divide : Europe Versus North America



Engineering staff in Europe trade away all forms of compensation for Base Pay—with a focus on equity that is commensurate with their counterparts in North America.

Focus on a strong Work Environment dominates the European engineering profile.

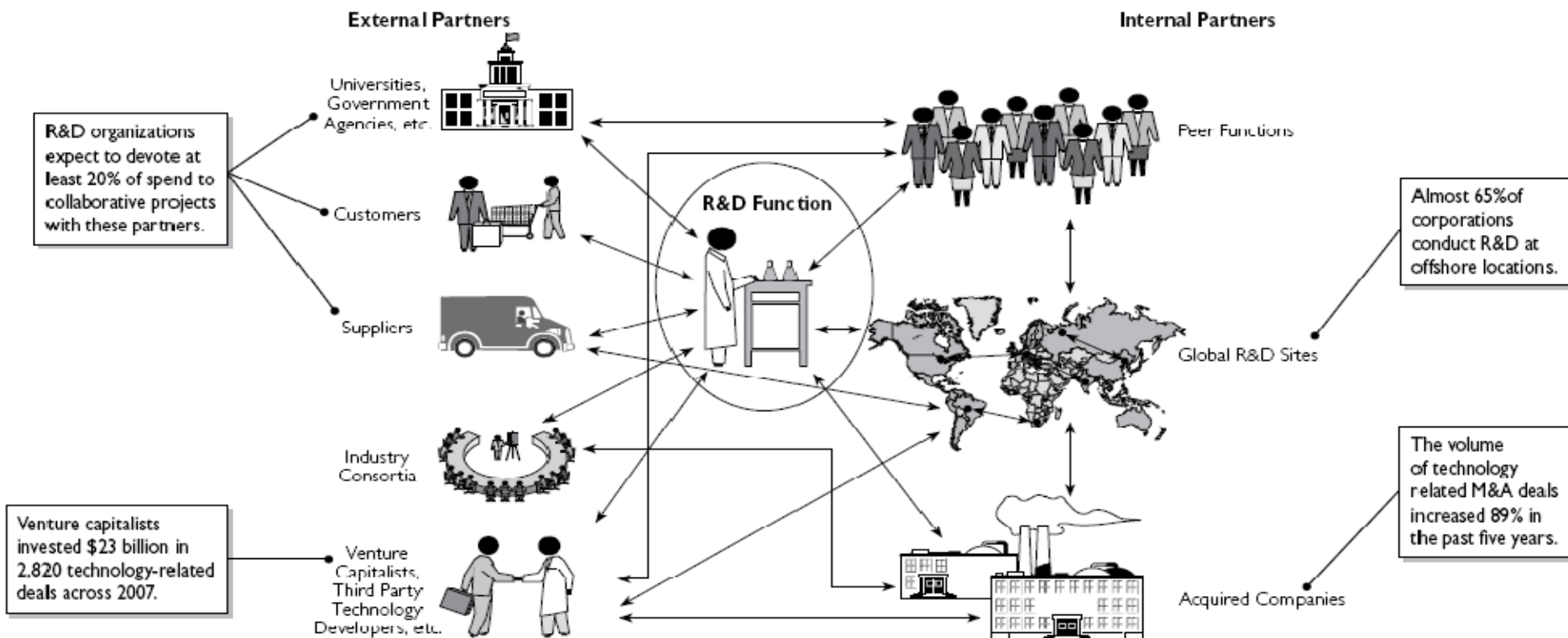
Engineers in North America are far more sensitive than their peers in Europe to where they spend their time (on Vacation, in Travel, at Home, etc.) while engineers in Europe place greater value on Work-Life services available at a work location.

Source: Employee Preferences Survey; RTEC research.

The Cross-Continental Divide: Europe Versus North America

- Engineering staff in Europe trade away all forms of compensation for Base Pay
- Focus on a strong Work Environment dominates the European engineering profile
- Engineers in North America are far more sensitive than their peers in Europe to where they spend their spare time (on Vacation, in Travel, at Home, ...) while engineers in Europe place greater value on Work-Life services available at a work location

Industrial R&D requires skills on top of technical ones... (by RTEC)



Some (fast-)food for conclusions : guideliness for innovative curricula in S&T

- **Ground rule:**
 - Keep excellence focus
 - Teach why you should learn/do it: what am I here for (social responsibility) ?
- **Teach how to:**
 - act « Globally » or « Flat »
 - act across disciplines (within and over « hard » S&T)
 - translate challenges into projects
 - learn from past mistakes
 - ...

Thank you !