Various demands for the development of engineers and products

Dr Graham Couchman
Chief Executive – g.couchman@steel-sci.com

2012

Who are SCI?

- SCI (The Steel Construction Institute) is the leading, independent provider of technical expertise and disseminator of best practice to the steel construction sector.
- Mostly UK focused.
- Independent organisation with 40 staff, turnover £3.5m

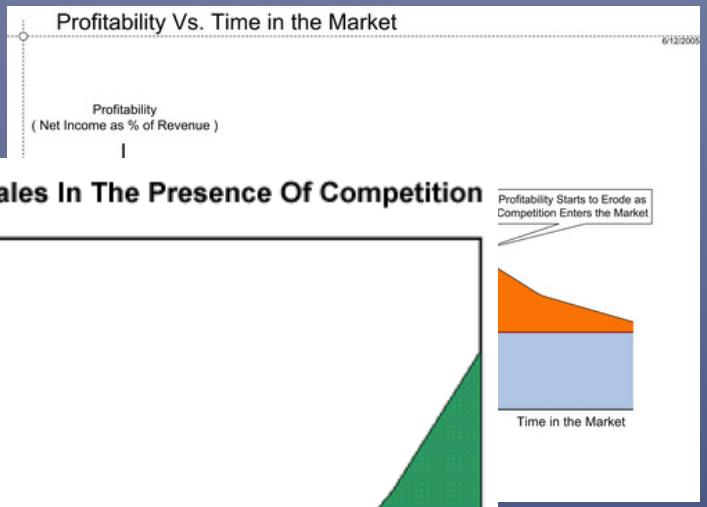
- SCI advisory service provides an interesting insight into industry problems
- SCI project partnerships provide an interesting insight into academia

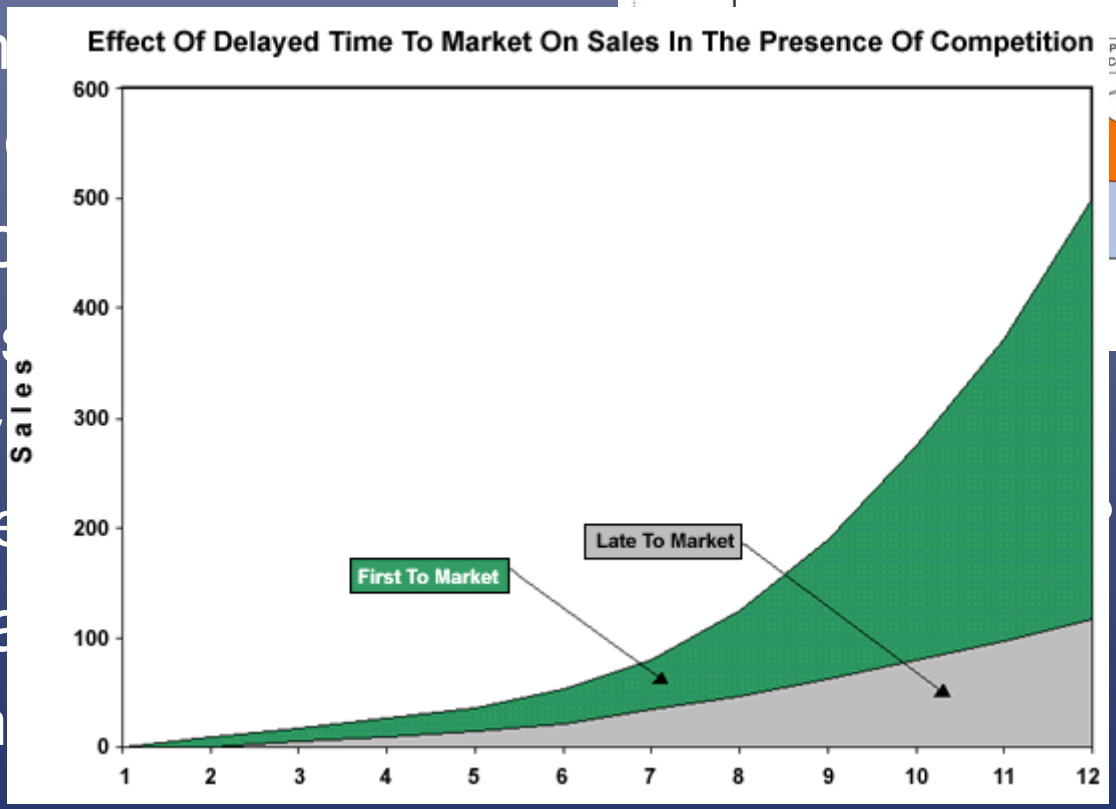
Various demands…

- Industry
  - What R&D support is needed?
  - What do organisations want from graduates?
- Government
  - What R&D does it want to support?
- Universities
  - How can they best service these needs?
- The role of an intermediate research and technology sector

Industry – R&D needs

- Rapid return on investment
  - Less than
  - Low risk,
- Low level c
  - Low levels
  - Driven by
  - Like some
- Confidentia
  - Secure m





Industry – R&D needs

- Add to ov
  - Depth c
  - Breadth within a and sat require
  - Volume on toda
- Solve pro

Government – R&D needs

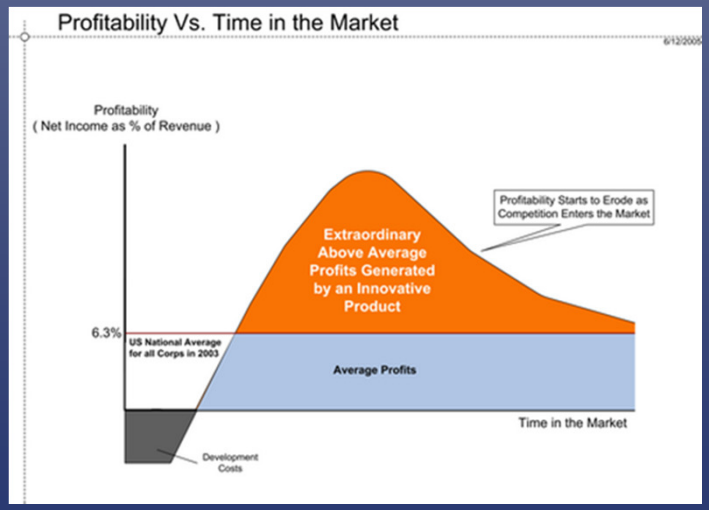
- Development of knowledge
- Innovative solutions
- Promoting collaboration
  - Industry to show it wants the work done by putting in some $
  - Multi-partners so benefit is not just for one business
- Help small businesses

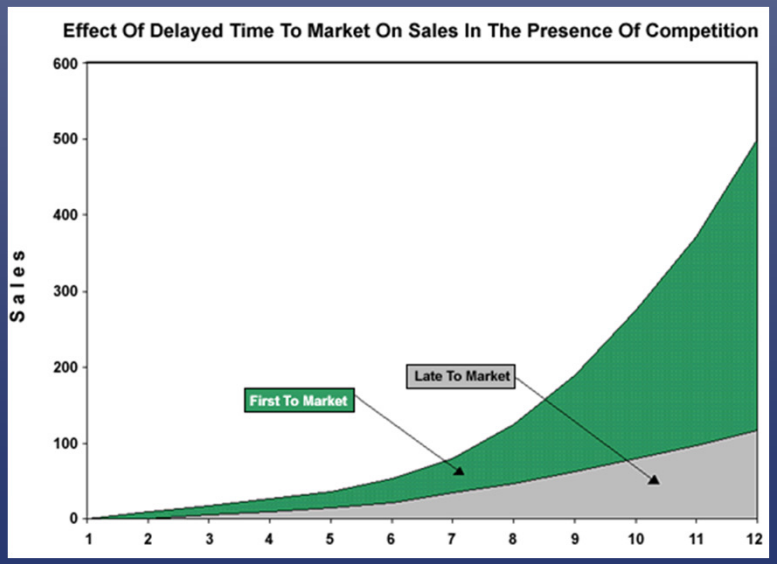
How can universities meet these needs?

- Researchers must have:
  - Deep understanding of specialist areas
  - Breadth of understanding – structures, building physics, regulations….
  - Funding mechanisms that do not penalise doing close-to-market consultancy
  - Staff who understand commercial pressures
    - Reality that work is not always ‘leading edge’
    - Ability to respond rapidly

R&D needs – some problems

- Innovative or quick results?
- Collaborative or confidential?
- Interesting or commercially relevant?





Ov

- S ate
  R
- O ersities
  to
  - Access to university facilities

- Each worker produces around 50% more GDP per person than average
- 60% qualified to at least degree level compared to 23%
- 1/3 of all R&D in UK by UK firms that is not done in-house
- Clients like the ‘problem solution work’ that is undertaken as distinct from academic research

Overcoming problems - SCI

- Grew out of British Steel
- Independent
- Specialist yet flexible staff
  - Many PhD or Masters level
- Close links to industry
  - 350 members
  - Real projects and real issues
  - Code development

Overcoming problems - better

- Government (other funding bodies) must recognise industry need for quick and focused benefits
- Industry must take a longer term view
  - But how – will the business exist in 10 years?
- Government must recognise the role of intermediary organisations, and their needs
  - Workable funding models
- Universities must develop responsive ways of working

Industry – needs for professionals

- Ready
  - Unde
  - Fami
- Confide
  deman much)
- Know v
- Able to
- Seek opportunities but happy to do boring work

Universities – supply professionals

- Close collaboration with industry
  - Graduates must understand the real world – problems, costs….
  - Design projects, visiting lecturers
- Encourage breadth
  - Train ‘construction experts’
  - Communication skills very important
- Provide post-graduate training

Case study – building envelope

- An interface of:
  - Products
    - Structure and cladding
  - Funding
    - Industry and government
  - Expertise
    - Different designers
    - Erectors

Case study – building make up

Case study – background

- Building Regulations for energy conservation resulting in heavier cladding
- Commercial pressures resulting in lighter secondary steelwork
- Products that work well together in theory
  - The cladding restrains the purlins
- Lots of problems in practice

Case study - funding

- Cladding producers blaming poor purlins
- Purlin manufacturers blaming poor fixing of cladding
- Industry wide problem
  - Multiple beneficiaries of solution
  - Also impacting on reputation of steel frames
- SCI acted as intermediary for industry
- 50% funding from UK Government

Case study – project

- Large steering group
- Resulted in SCI publi
  - 65 pages
  - Covers built-up and ir
  - Roles during design a
    - Cladding specifier must un
      decisions and assumptions
  - Agreed best practice for erection
  - Badged by Corus, two trade associations

Conclusions

- The research needs of industry and government are not the same
  - Industry has little choice
  - Government must be realistic
- Traditional university research does not address all of industry's needs
- We must train construction professionals with a broad understanding, because construction is complex

SCI is the leading, independent provider of technical expertise and disseminator of best practice to the steel construction sector. We work in partnership with clients, members and industry peers to help build businesses and provide competitive advantage through the commercial application of our knowledge. We are committed to offering and promoting sustainable and environmentally responsible solutions.