Research Project:
The future needs of engineering

Ann Bailey

Head of Education and Skills

Research Project:
The future needs of engineering

Agenda

- **Background**
- **Methodology**
- **Engineering Today**
- **Engineering Tomorrow**
- **Successful Companies/Graduates**

Research Project:
The future needs of engineering

Old Economy		***Parameter***		**New Economy**
Physical world	⇐	*Cost economics*	⇒	Information
Low	⇐	*Knowledge content*	⇒	High
Hierarchical	⇐	*Organisation*	⇒	Networked
Local	⇐	*Markets*	⇒	Global
Regulated	⇐	*Competition*	⇒	Hyper
Organisation	⇐	*Power*	⇒	Customer
Incremental	⇐	*Innovation*	⇒	Radical

Figure 1: Major characteristics of changes facing UK industry

Research Project:
The future needs of engineering

- **The Project**

“To determine the skill needs of engineering in the next two decades”

Research Project:
The future needs of engineering

- **The Methodology**

  Stage 1

  - Literature review, interviews and data analysis
  - Drivers for change
  - Directions and challenges

  Stage 2

  - Scenario planning and focus groups
  - Testing out conclusions
  - Reaching consensus

Research Project:
The future needs of engineering

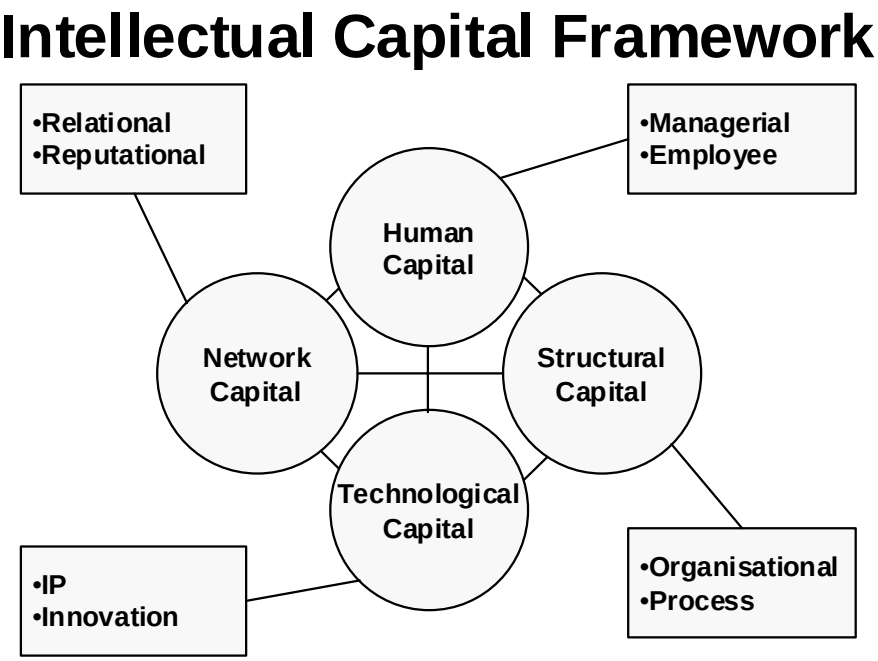
- ‘Movers and Shakers’
- Engineering companies
- Different sectors of engineering
- Academics
- Think Tanks
- Unions
- Geographical spread

Research Project:
The future needs of engineering

‘Intellectual Capital? Like physical capital. It’s...

- Investments in resources in the expectation of future benefits
- Ongoing to maintain assets and create new ones
- Important to invest in current stocks and future flows to maintain those stocks, and
- Any assessment should address current resources and their replacement/regeneration’.

Research Project:
The future needs of engineering



Research Project:
The future needs of engineering

Engineering Today

- **Human Capital**
  - Increased skill demand
  - Lack of managerial competencies

- **Structural Capital**
  - Increased team working
  - Slow rate of cultural change

Research Project:
The future needs of engineering

Engineering Today (continued)

- **Network Capital**
  - Poor image continues to be a problem
  - Criticism of Engineering Institutions
- **Technological Capital**
  - Change is evolutionary for larger firms/revolutionary in SMEs
  - R&D levels and direction a concern

Research Project:
The future needs of engineering

Vectors of Contention

Product	⟷	*Service*
Component	⟷	*System*
Supply	⟷	*Demand*
Transaction	⟷	*Partnership*
Globalisation	⟷	*Localisation*
Shareholders	⟷	*Stakeholders*
Depth	⟷	*Breadth*
Education	⟷	*Learning*
Efficiency	⟷	*Effectiveness*

Research Project:
The future needs of engineering

- **Product -Service**
  - Blurring
  - New technology-based sectors
- **Component-System**
  - Need to specialise v need for systems approach
  - New relationships
- **Supply-Demand**
  - Buyer Power & Sophisication
  - Supply Chain ➢ Demand Chain

Research Project:
The future needs of engineering

- Transaction-Partnership
- Globalisation-Localisation
- Shareholder-Stakeholders

Research Project:
The future needs of engineering

- Depth-Breadth
- Education-Learning
  - culture of learning
- Efficiency-Effectiveness

Research Project:
The future needs of engineering

Engineering Tomorrow

- A fragmented industry
- Higher value added but not always high technology
- Networked locally, connected globally
- T-shaped skills and capabilities
- Just-in-time world
- Deep learning at all levels

Research Project:
The future needs of engineering

Characteristics of the successful company/ graduate

- Ability to build upon and exploit existing knowledge
- Ability to develop new knowledge
- Agility and flexibility to exploit that knowledge

Research Project:
The future needs of engineering

Ann Bailey

Head of Education and Skills