Technology Assessment and Technology Transfer

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Co-ordinator – Integrated Healthcare Technologies, EPSRC
- covering -

- What could the future be?
- What are the barriers to uptake of new technologies?
- What role does Technology Assessment play?
- Possible ways to break the log jam
- MATCH consortium
Perfect Future?

- Typical healthy life span to over 100
- Artificial replacement body parts
- Ubiquitous Telecare/Telemedicine
- Restoring sight
- Robotic assistance and help
Key questions for exploitation decisions

- Is there a need for it?
- Will it work?
- What is it worth?
- Will people buy it?
Is there a need?

- Will there be applications for the technology
- Who are the potential users of the technology
- How will we find an optimum configuration for the technology?

Major issues

- Ethics of researching needs and value of ATs
  - Intrusiveness
  - Personal information
  - Clinical Trial Ethical Approval
Will it work?

- Getting it through regulatory hurdles
- Will it fit within constraints of current infrastructure?
- Is the underpinning science and technology there?
- Where are the several technology life cycles?
- Are there consumer drivers which will significantly impact cost and availability?
- “Design for All”? 
How well does it fit?

- **Fit with industry**
  - Customer companies
  - Competitor response

- **When will industry want to get involved?**
  - Industry cycle:
    - Pharmaceutical industry cycle
    - Information technology cycle
  - Investment required
  - Technology scalability
  - Scope for evolution
  - Supply chain
Supply Chain issues

- What is the supply chain?
- What is the value chain?
- Who drives the value chain in innovative technologies?
  - Customer?
  - Technology Source?
  - Service provider?
Products to Systems

1. Components
2. Components
3. Components
4. Components
5. Components
6. Components
7. Components

Product manufacturer

Customer

Sub-System

Product

Equipment

Service

Systems Integrator

Service Deliverer

Customer
TCPI: TeleCare Planning & Implementation

- **Multidisciplinary Project**
  - Imperial College (was SPRU, University of Sussex)
  - Industry: ICT, Facilities Management, AT suppliers
  - Healthcare Providers: North West Surrey

- **Theoretical study of supply chain issues**

- **Columba Project**: assessment of patients to remain at home with Telecare support
## Funding Types

<table>
<thead>
<tr>
<th>Basic Science &amp; Technology</th>
<th>Research Councils</th>
<th>Is this the real blockage?</th>
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<tbody>
<tr>
<td>Deployment Funding</td>
<td>DH/NHS</td>
<td>What do we have to do to get this started?</td>
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<tr>
<td>Development funding</td>
<td>Industry and DTI support</td>
<td>Effective works comes only after technologies have been proven effective in principle and limited practice</td>
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Unless systems are used, we don’t know what problems to solve
Procurement of Health Technologies

- **Difference between UK defence and NHS models**
  - Recognise strategic need
  - Motivate a supply chain to design and deliver
  - Procure technology
  
  *vs.*

  - Hope it is there when we want to buy it

- **Health Technology Procurement Risks**
  - Obsolescence – first generation risks
  - Value of technology
  - “Post code” availability
  - What functions are needed on roll out?
Customer risks

- “Ageing Customer” wealth?
- Technology acceptance?
- Extension of active working life?
- Pensions?
What is it worth?

- How can we ‘measure’ the worth of a technology?
- Health Technology Assessment
- What do we mean by Data?
  - Quality
  - Diversity
- Modelling vs. measuring
- When do we measure a technology’s value?
Engineering based technologies are dynamic

- **Difference between engineering and traditional pharmaceutical ‘cures’**
  - Learning curves for users and developers
    - Reduce cost
    - Improve effectiveness
  - Continuing technology improvement (2-5 year refreshment cycles)
Value – How to assess it?

- **Value from whose viewpoint?**
  - Users
  - Carers
  - Payers (NHS/DSS)
  - Insurance
  - Society at large

- **Cost**
  - Initial cost
  - Life cost

- **Benefits**
  - Welfare impacts
  - Resources freed
  - Opportunity value

- **Factors external to the technology which can impact value (e.g., Training)**
Technology Transfer

- **Who to transfer to?**
  - Large companies
    - Strategic Fit?
    - Capacity?
  - SMEs
    - Insufficient resources for a major technology
  - Consortium
    - Lack of stability to see through to market
Barriers to technology transfer

- Industry Weaknesses
- Technology Complexities
- “Product” Definition
- Market weaknesses
- Capacity to innovate
Capacity to develop new Technology

- VC Investment - £5m to £50m
- Typical “winner” success rate – 10%
- Investment cost per “winner” technology - £200m
- Investment cost for 100 new “winner” technologies?
  - Money
  - People
Improvement in medical engineering industry performance based on better informed use of technology assessment methodologies leading to:

- Accelerated time to market uptake of good innovative technologies
- Improved iterative product development programmes
# Research Themes

| Pre-clinical assessment of value | - Modelling and demonstrating value - especially at early project stages (concept onwards), taking into account the whole health system within which the technology is used  
- Pre-clinical models, and processes to validate models of value throughout development  
- Assessment and decision-making with small datasets |
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<tbody>
<tr>
<td>In-use evaluation</td>
<td>- Mapping and evaluation of data collection methods</td>
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</table>
| Optimising the product development process | - Models for improved decision making and development process by using information from technology assessment  
- Integration of assessment methodologies into the development process: guidance on what methodologies to use when |
| Transfer of methodologies into practise | - Mapping of available methodologies and identification of gaps  
- Translation of existing methodologies for use in the medical devices environment |
Match proposal

Multidisciplinary Assessment of Technology Centre for Health

University of Ulster
University of Nottingham
University of Birmingham
Kings College London
Brunel University

Hubs
The Medical Technology sector

- **Global Business £100B+**
- **UK £3B**

**ISSUES**

- In the market
  - re-entering regulatory cycle
- At launch
  - evidence of value
- In late development
  - strategy to gain evidence
- In early development
  - picking winners 5-10 years out
  - making them to cost & spec
How can we untangle this?
So why should a group of academics hope to make any impact?

Because there is compelling academic research for each critical industrial problem.
What can we do in these areas?

**Intellectual innovation**

**Project 1**

*New methods for assessing value at all stages*

Prof Richard Lilford (Birmingham & DoH R&D)

Prof Martin Buxton (Brunel)

Prof Hywel Williams (Nottingham & Director, Trent Inst. Health Service Research)

**Project 2**

**Project 3**
What can we do in these areas?

Intellectual innovation

**Project 1**  
New methods for assessing value at all stages  
Prof Richard Lilford  
Prof Martin Buxton  
Prof Hywel Williams

**Project 2**  
Methods for optimised processes  
Prof John Anderson & Dr Brian Meenan (Ulster)  
- strong industrial engagement  
Prof Terry Young (Brunel) - 16 years in industry

**Project 3**
What can we do in these areas?

Intellectual innovation

Project 1
New methods for assessing value at all stages

Prof Richard Lilford
Prof Martin Buxton
Prof Hywel Williams

Project 2
Methods for optimised processes

Prof John Anderson & Dr Brian Meenan
Prof Terry Young

Project 3
Methods & metrics for engagement with users

Prof Ian Robinson (Brunel) - sickness, disease, etc
Dr Trisha Grocott (KCL) - patient care
Dr John Crowe (Nottingham) - engineering approaches
It’s a two speed economy

Intellectual innovation  MATCH  Industrial impact

Intellectual rigour is critical

IPR works best if it persuades everyone

Must stand up to peer review

Deadlines are critical

IPR works best if it is kept confidential

Must survive in the market
So we partition the programme

Project 1
Project 2
Project 3

Intellectual innovation

Project 4
Project 5

Industrial impact

Interpretation & Dissemination Support

Applied Research for Research Partners

(Nottingham link To Med. Dev. Faraday)

Industrial network & regulatory forum

...with two links
## Will MATCH make an impact?

### What are the critical success factors?

- Compelling intellectual innovation linked to critical industrial impact
- Commitment to industry’s needs
- A highly cross disciplinary team of exceptional people who can work together
- Partitioning and management structures to handle the academic/industrial interface
- Commitment to the wider community
- A growing international network.

MATCH meets them all
Conclusion

- **Focus on improving procurement of good Assistive Technologies**
- **Partnership with healthcare funding bodies:**
  - Researchers
  - Industry
  - Healthcare
- **New methodologies to determine value of technologies at earliest stage**