Senso	rs
Knowledge	Transfer Network

THE SENSORS KNOWLEDGE TRANSFER NETWORK

Sensing Innovation



	Sensors
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What is the Sensors KTN?

The UK's sensing network

Activity and services for sensing community

Recognises importance of sensing to economy

Supported by DTI





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Who runs the Sensors KTN?

Managed by NPL and Qi3

Strategic guidance from industry advisory board



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Sensors complement our industries and our lives

Environmental monitoring

Healthcare and drug discovery

Structural integrity assessments

Automotive safety







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Sensing is more important than ever

New applications from the convergence of computing and sensing

Wireless networking of embedded sensors and microsystems





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The global sensors market

Expected to reach £25bn by 2008

Growth expected from automotive, environmental, gas, chemical, optical and biosensors



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What the Sensors KTN does?

Works with industry and researchers to exploit sensors

Advises government about the future impact of sensing

Transfers sensing knowledge to the business community



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Who is in the Sensors KTN?

Academics and universities Large and small businesses Research Councils Govt departments Special interest groups Users of sensors Knowledge Transfer Networks A DTI business support solution Delivered through the Technology Programme



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What do we mean by sensors and sensing?

Aim to stimulate new developments and uptake of sensing technologies



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Supporting the sensing supply chain

Connecting companies to new research

Raising awareness of emerging technologies

Representing the sensing community to government





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Helping small companies exploit sensing

Raising the profile of SME developers

Brokering introductions with customers

Preparing for the market

Winning funding





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Connecting academics to industry

Turning research into products

Collaborations and industrial partnerships

Supporting spinout companies

Creating new markets

Funding opportunities





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Driving sensing innovation

Advising funders and policy makers

Leading funded activity to drive growth in sensing

Giving specialist networks access to a wider sensing community



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Sensors KTN activities

Connecting the sensing community

Technology translators developing strategy and roadmaps

Intelligent Sensing Programme

International conferences and missions





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Sensors KTN online:

www.sensorsktn.com

News and information about sensors

Personalised search function

Platform for collaborative working

Online meetings and seminars



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Contact

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Drivers: Costs

• Consumer desire for guarantees of the type: this product or environment is free from - gluten, GM, radioactivity, bombs, deviant thinking, political incorrectness etc.

- Performance
- Applicability
- Functionality
- Extra laboratory testing
- Sustainability
- Alternative methods for energy harvesting

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Questionnaire responses

Drivers: Environment

- Turning unexpected scientific effects into gadgets
- Processing / fabrication
- Versatility
- in situ monitoring
- Data collection and management

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Drivers: Flexibility

- Turning gadgets into commercial tools
- Longevity / robustness
- Duplicatable
- Reliability
- Low cost analysis
- End of Life considerations
- Environment
- Performance

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Questionnaire responses

General Comments

The adoption of a new material and assuming that, once available, sensor materials cost is a very small part of total systems cost. Key developments would lead to the availability of materials for high temperature applications or sensing at the nano-scale.

End of Life considerations must be incorporated from the start. Sensors can provide data that will enhance sustainability. Applicability – anything that is applicable (e.g. wearable) should not require a manual to use Versatility – Technology should be adaptable to both the users and the applications

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R&D Comments

Diagnostics & sensors generally combine a range of sciences - chemistry, physics, biology, computing, engineering + design and ergonomic skills.

Integration of sensing materials into systems at the micro or nano scales Materials processing & its simulation Reliable interfacing with sample Hybrid structures – best use of available and new materials

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Advanced Materials Comments

•Multi-material micro-scale devices

•New materials

•Avoid duplication

•Incorporation of Sensor systems into design

•Performance in extreme environments (corrosive, high T, in-the-body)

•Understand and optimise new materials' properties (e.g. nano materials)

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New Materials Comments

•Bio compatibility of sensing systems

•Ensuring that the science is need driven not science driven

•Device integration

•Continuous readout

•New material development

•Multi-functionality

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Comments

The main difficulty is in integrating these contributions
Availability and adoption of new materials

Appreciating the end user and the afterlife of the technology
Need engineering + materials to be improved

•For organisations to change from current practise the 'new' materials must be delivered in forms that deliver significant advantages (more sustainable, easier to assemble/dismantle, can be recovered/recycled). Sensor systems could help monitor performance, guide maintenance practise, and define end of life.

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Barriers

Only one (all embracing) barrier, The different disciplines do not talk to each other. The guys with the problem are ignorant of potential developments in the pipeline - and vice versa

•Lengthy timescales associated with development of complex new technology through to production leads to business uncertainty and consequent difficulties in bringing projects to fruition

Sensors demand complex materials/chemistry/physics interplay – need to integrate effort

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Finding the right opinion leaders and enabling them to leverage the new discoveries

Poor support to SMEs and startups

Reliable bio- and biomimetic materials

Continuity and skills retention a problem

Disconnect between research and exploitation

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Sector	Structural Materials	Functional Materials	M u Itifunctional M aterials	B io m a te ria Is
Healthcare	Im plant wear / prosthetics	Telem edicine/ robot surgery Body signs	Health monitoring 'wearables' Remote sensing Biocompatible materials	Assays Drug delivery systems Intelligent Implants
Energy	Embedded Sensors Structural Monitoring On-line sensors	Coated Systems Heat, Pressure, temperature sensors	Diagnostic Coatings Structural Health Monitoring systems	W aste m an agemen t
Construction	Lifetim e measurement	Concrete ageing	Structural health monitoring/ diagnostics	Microbial hazards
Transport	Composite monitoring	Heat, pressure, wear Asset management Proximity alarms	Integrated sensors/ actuators Self-diagnostics	Driver alertness Environment quality
R e ta il		Produce lifetim e Stock management	Smart packaging Sports equipment Product Tagging Printable power	Antifouling Biosensing
C om m unications	Asset management – proactive fault reporting	Magnetic Optical Network security		Biomimetic networks
Security	Structural/building management – earthquake sensors	Smoke detection Gas detection Identification	Anti-counterfeiting Offender tagging Biom etrics	Biometrics Biohazard detection
Agriculture			Product Tagging	
Food			Smart Packaging Antimicrobial surfaces Food processing sensors	