

**BIS' INNOVATION
INFRASTRUCTURE –**

**WORKING TOWARDS AN
INNOVATION SYSTEM**

Project Report

APRIL 2010

**CONDUCTING THE ORCHESTRA, UPPING THE VOLUME & DELIGHTING THE
AUDIENCE**

BIS Innovation Infrastructure Project: Working towards and innovation system

Report

In association with:



Technology Strategy Board
Driving Innovation



BIS Innovation Infrastructure Report

Working Towards an Innovation System

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1. Executive Summary

This report concludes that both BIS and Government as a whole are missing opportunities to improve the design and delivery of policy through unsystematic and haphazard engagement of the innovation infrastructure. Stronger and more systematic links both ways would strengthen the policy making process.

Equally, there are clear opportunities to connect the customer-facing activities of the innovation infrastructure. Wider and deeper sharing of knowledge around the infrastructure would create opportunities for a stronger and more coherent innovation offering to customers in both the private sector and government.

The recommendations in this report should, when implemented, lead to a noticeable change in the connections between different organisations within the innovation infrastructure and to better connections between that infrastructure and the business, societal and Government customers it exists to serve.

The recommendations are largely incremental improvements. As the infrastructure bodies work together more closely – and as key customer relationships develop – we would expect them to, in turn, generate more numerous and deeper connections and pieces of collaborative work. We have not sought to predict the precise direction in which these might go. Hence we have not specified medium or long term targets for the operation of the infrastructure. However, BIS in its role as steward of the innovation system should monitor the connectedness of the system and, perhaps, periodically assess progress through a process such as the Annual Innovation Report.

1.1 Background

In his 2007 Report *Race to the Top* Lord Sainsbury coined the term “innovation ecosystem” to describe the framework of laws and public bodies, and their services, intended to support innovation. He called for better alignment and coordination among these bodies.

This project has looked at and worked with six of these bodies, all of which are BIS delivery partners (British Standards Institution, Design Council, Intellectual Property Office, National Endowment for Science, Technology and the Arts, National Measurement Office (which contracts with NPL, LGC & TUV-NEL to collectively form the National Measurement System (NMS)) and UK Accreditation Service). For brevity these bodies have been referred to throughout this report as the NI6 – National Innovation 6. We have also worked closely with associated bodies such as the Technology Strategy Board, SEEDA and UKTI, all, especially Technology Strategy Board, are central to innovation support. The Technology Strategy Board are in the business of „driving innovation“, their vision is “For the UK to be a global leader in innovation and a magnet for innovative businesses, who can apply technology rapidly, effectively and sustainably to create wealth and enhance quality of life.” We believe that the innovation infrastructure formed through the six bodies we have studied during this project help to facilitate this drive. For those who do not know these bodies and their work a one page summary of each is annexed.

The purpose of the project has been to see whether, three years after *Race to the Top*, scope remains to improve the way these bodies collectively work. We have focused on three broad areas:

- Policy: whether the parts of the infrastructure could be better joined up and more responsive to central strategic policy direction, whether that strategic direction could be developed and conveyed more clearly; and whether the feedback loop back into policy making could be strengthened;
- Customer delivery: whether the customer service functions (and signposting between bodies) are arranged so as to optimise access for customers, and to answer questions at the right level of depth at the right time? Are they well enough connected to each other, and supplying as much insight as they could to policy makers?
- Economic impact: what the available evidence tells us about the importance of the innovation infrastructure for the overall performance of the UK innovation system, and may suggest about any scope to secure better value for money in a tightening fiscal environment.

We have been greatly assisted by the readiness of all the bodies to help us with our work. We are very grateful to them for this, and for their forbearance in responding to our many questions. The report and recommendations have been produced through an interactive process with the NI6 and as such the recommendations are well supported.

1.2 Findings

1.2.1 Policy

As suspected at the outset, the thrust of the evidence shows that these six organisations have fed into innovation and industrial policy making (contribution to industrial/sectors policies e.g. previous government's New Industry New Jobs initiative as an example) in a **disorganised and serendipitous manner. This is despite the fact that in other areas these bodies directly lead policy, eg copyright, legal metrology.** Whilst there are pockets of good practice, these are by no means widespread. In the area of innovation policy making, there was more involvement and good pockets of knowledge in "HQ", but even here there was a great opportunity for improvement. Although bodies had been involved in developing DIUS' Innovation Nation White Paper in 2008 for example, they were often not consulted in a timely manner on other issues. There was a clear and definite view that BIS was not a good steward of the innovation system as a whole, failing to strategically analyse or actively manage it **as a whole**. Other associated bodies echoed this sentiment.

This matters not only because Ministers and officials are missing out on significant reserves of knowledge, customer insight and creativity, but we are also disenfranchising key partners and potentially damaging key relationships. There is no doubt that the infrastructure could be better joined up and more responsive to central strategic policy direction. Equally, this presupposes that there is a strategic direction

from the centre. This needs to happen and the direction of travel needs to be clearly communicated and informed by high quality intelligence flows from the innovation infrastructure – our recommendations seek to address this.

1.2.2 Customer Delivery

There are good reasons to believe that the potential of the NI6 to support innovation is not being fully realised. The size and character of their shared and individual target markets is not well understood, which makes it difficult to determine whether services are reaching all who might benefit. Awareness of the bodies and their services among those who might use them (in the private sector) is frequently low, and users of one body are often unaware of the others. The six operate largely independently of each other, so that there is no mechanism for communicating a collective service offer (should one be needed or desired).

This matters because, although only a small minority of firms will want that combined offer, the group who will includes some high-technology SMEs – a strategically important high potential growth group (although it should be noted that the impact of the NI6 is across the board).

In addition with ever more pressure on public spending, the potential for economies of scale for the NI6 as a whole in communicating with customers and potentially offering combined or coordinated services (where possible) need to be explored to ensure that they are optimising efficiency as well as effectiveness.

The wider context of this report is the challenge in the **Smarter Government** White Paper to ensure that all public services are easy for customers to access using optimal customer channels. A specific commitment in the White Paper relates to the digitisation of public services –moving all transactional online with a roadmap to be produced by each Department by December 2010. This built on the Varney report into Service Transformation which first set out the requirement for departments to develop channel strategies including commitments to web convergence and rationalisation and the reduction of avoidable (unnecessary) contact through call centres by 50%. While the work of this report was not specifically designed to address these issues the need to understand the NI6 customer base and how they interact are necessary stepping stones to achieve the aims of Smarter Government.

Our recommendations here are intended to deepen understanding of the market, to communicate services more effectively, to stimulate new ways of engaging with the market, and to exploit the scope for defining and branding a collective service offer.

1.2.3 Economic Impact

The organisations considered in this report form part of a broader UK knowledge infrastructure that encompasses universities, research laboratories and many consultancies, standard-setting bodies and regulators, knowledge transfer networks and other routes for the creation, exchange and dissemination of knowledge relevant to innovation.

There is evidence to suggest that the innovation inputs and processes considered in this report – intellectual property protection, measurement, standard-setting, design – play a significant role in the innovation activities of many firms and thus are important factors explaining the UK's overall innovation performance. For example:

- NESTA's pilot Innovation Index suggests that UK businesses spent £22 billion on design in 2007, compared to £15 billion on R&D.
- DTI-commissioned research found that the growth in standards accounted for one eighth of the post-War growth in total factor productivity.

Existing research has also demonstrated a need for public policy to be involved in these areas. In some cases, e.g. intellectual property protection, this is inevitable because of the need for regulation. In other cases, there is evidence of market failure.

There is also some evidence available on the performance and impact of these organisations and their activities, for example, through international benchmarking or evaluation of specific initiatives. Nevertheless, evaluation is an activity where there may be scope for further activity and joining up.

1.4 An Innovative Project

We tried to conduct this project in an innovative and evidence based manner. We used:

- A multi-disciplinary team made up of key people seconded from the bodies, senior BIS analysts, BIS policy makers and project pool colleagues.
- An open working style - looking for new ideas, connections and networks to gain value from the very different historical working styles and domains of the 6 bodies.
- A traditional project management structure with an SRO, Gantt chart and involvement from Treasury.
- Distance working - using video and telephone conferencing, email and face to face meetings.
- Open meeting sessions hosted at the bodies themselves, using 2 types of facilitator.
- Three designer-facilitated customer sessions - using design tools such as visualisation, "sacrificial concepts", and journey mapping.
- Utilised the skills contained within the NI6 i.e. Chief Design Officer of DC in building customer profiles
- Central focus on customer views - articulated through surveys, workshops etc, but also recognising that customers cannot always articulate future needs and may need to try something new in prototype.
- International comparisons, drawing on the BIS SIN network and our policy teams.
- Recognition that small steady steps to prototype and trial innovative ways of working can deliver as much change as major institutional upheaval.
- A positive attitude to risk and failure - i.e. some ideas we propose prototyping will fail, but hopefully some will come through as successes for some customer groups.
- Recognition that there is no international precedent for these joined-up ideas; they may be seen as marginal to each body; their success cannot be forecast; and there may be as yet hidden obstacles.
- Recognition that - as with many innovations - to deliver lasting change will require persistence and hard work over the next 1-3 years - well beyond the enthusiasm of any new announcement or initiative. There may be a "middle failure" patch before success and institutional resistance to defend the status quo.
- Recognition that all innovation needs an energetic champion to see it through the "middle failure" stages - and this project needed (and still needs) one too.
- Recognition that the next phase will need financial and staff commitment to succeed - albeit "quick and dirty" with prototypes. .
- Recognition that the bodies have different institutional statuses so they do not cohere in organisational terms this means they can be challenging to steer collectively.
- Recognition that success is most likely to come from all the NI6 bodies cohering around a clear and shared vision of what the customers need in future - and being passionate about delivering it. All heading towards a shared ultimate goal.

1.5 Project Management Board & Team Structure

Simon Edmonds, Director of Innovation, BIS - Senior Responsible Owner
Chris Hewitt, Deputy Director, Innovation Delivery, BIS
Robin Webb, Innovation Director, IPO
Mark Beatson, Head of Science & Innovation Analysis, BIS
Jo Symons, Director of Strategy, NMO
David Keenan, HMT

Project Management Team

Chris Hewitt, BIS
Robin Webb, IPO
Mark Beatson, BIS
Jo Symons, NMO
Sarah Webb, BIS
Guy Robinson, IPO
Nigel Pargiter, Smarter Govt, BIS
Karl Willes, BIS

Project Inner Group

Stian Westlake, NESTA
David Godber/Mel Taylor, Design Council
Malcolm Hynd, UKAS
Mike Low, BSI

Project Outer Group

Tim Goodship, BIS
Simon Chater, BIS
Daniel Mansfield, BSI
Mat Hunter, Design Council
Julian Braybrook, LGC
Neil Harris, LGC
Robert Gunn, NMO
Niall Boyle, NMO
Brian Bowsher, NPL
David Nettleton, NPL
Graham Torr, NPL
David Mulligan SEEDA
Ann Johnstone, SEEDA
David Evans, Technology Strategy Board
David Golding, Technology Strategy Board
Ian Gray, Technology Strategy Board
Brian Millington, TUV NEL
Steve O'Leary, UKTI

2. Recommendations

Chapter 3: Policy making and the BIS innovation infrastructure

Recommendation 1 A major annual **Innovation Mandating Conference** where:

- a) Senior BIS officials from policy areas such as Innovation, Business, Regions, UKTI, will hear “**State of the Nation**” feedback from the Chief Executives, Chairs and possibly external trustees from each body and from Technology Strategy Board. This feedback will be of a high level, strategic and operational, detail. HM Treasury and RDAs also to attend. This gives all attendees the opportunity to „survey“ the infrastructure.
- b) All debate and consider topical **wider innovation ecosystem issues** and focus on their **joint** offering as well as their individual offers.
- c) BIS officials then convey **strategic and political context and priorities** for the next one to three years, and specifically what they want from the NI6. This will then feed into annual and CSR funding discussions. This would probably be held in December or January each year, prior to the issue of annual funding letters for the next financial year. Innovation Directorate to arrange. (Cost £5K)
- d) Annual identification and co-creation of strategic themes (often cross-government) where the bodies can play a key role (e.g. with or without Technology Strategy Board.)

Recommendation 2 A body of continuing shared activity:

- a) Innovation Ideas Events – creatively facilitated occasional events to keep re-stocking the store cupboard with analysis and new policy and delivery ideas across the “silos”. Build partnership and trust and ensure non-traditional thinking is encouraged (i.e. in line with PSI principles).
- b) Quick Win Shared projects - create joint project teams, led by the infrastructure bodies themselves, where a topic is already being tackled in many places e.g. Water, metering, sustainability. Then liaise jointly with the relevant policy team.
- c) Partnership Commitment - to involve all the bodies in co-creation of policies throughout the year – not just “send

them the relevant paragraph of a near final document". This echoes BIS capability review commitments.

- d) A joint programme of Awareness Events within BIS for the whole NI6 group (cf building on innovation visits organised by the public sector team) possibly organised by sector theme e.g. energy, sustainability.
- e) A quarterly News-sheet or e-mail letter aimed at BIS policy makers, highlighting key emerging trends, events, and with rolling focus on one partner each quarter. One member of NI6 to lead with content leads in each body from the PR/press functions.

- Recommendation 3 A clear **Combined Offer** – in a standardised format – of the different bodies and the strands within them – packaged in a combined folder and then maintained online. This would offer a visual representation of the NI6 and where they fit into the innovation ecosystem.
- Recommendation 4 Consider the costs, benefits, competition aspects and potential offer of a “**preferred partner**” **Innovation Consultancy service**, provided by one or more of the NI6 partners. (Not focussing on public sector’s own innovative capacity but providing the sort of services E&Y, Pera do.)
- Recommendation 5 Create new **BIS intranet page** on the six bodies and their “offer”.
- Recommendation 6 **Review BIS Website** Innovation content – look at presentation and linkages to NI6
- Recommendation 7 A programme of **secondments** into each relevant policy team, brokered by ID. ID to specify bodies’ staffing of BIS projects and supply matching resources from BIS to offset. These could be for a range of lengths from short periods to the sort of longer term secondment arrangement that has been operational with the RDAs for a number of years to fill the BIS policy making post on regional innovation. Secondments could be brokered with wider government including the foresight team.
- Recommendation 8 An annual **Horizon Scanning Conference**. This would be more specialist in nature than the Innovation Mandating conference, involving the research and analysis functions of each body sharing key work and evidence on trends, economic impact, customers etc. NESTA’s research team or the UK~Innovation Research Centre might lead such a conference, working with the GO Science Foresight team, Innovation Directorate and BIS’ EPA and RB analysis teams. Costs should be shared across BIS, GO science and partners, with opportunities for sponsorship.

Chapter 4: Private sector customers

- Recommendation 9 A business client mapping exercise be conducted, by end 2010, building on work currently being done by Technology Strategy Board, Business Link/SERCO and by the university sector. This could be co-funded from the proposed NI6 challenge fund (see recommendation 14).
- Recommendation 10 Re-packaging and re-positioning NI6 services for key sectors, we recommend that the NI6:
- a) Develop and pilot a shared face-to-face “event” offering for key sectors starting with an event at London Design Week in September 2010 (see annex 18)
 - b) work closely with Business Link and SERCO as they develop sectorally tailored website offerings (e.g. new manufacturing pages on BL.gov)
 - c) seek to pilot new shared areas on BL.gov (by end 2010).
- Recommendation 11 Sharing routes to raise overall awareness of other parts of innovation infrastructure - Co-use of each others’ customer bases to increase collective visibility, and individual communications and marketing departments to look at ways of cross-marketing. NI6 to report back quarterly to BIS on progress during 2010.
- Recommendation 12 Working more closely with the Technology Strategy Board - a communications plan (encompassing various innovative joint interventions) to engage businesses within relevant KTNs be devised and carried out in conjunction with Technology Strategy Board, and supported by a dedicated person in each organisation. The plan should include evaluation and review after a period to assess effectiveness and the case for continuing or expanding the activity. This could be co-funded from the proposed NI6 challenge fund (see recommendation 14).
- Recommendation 13 Building on current IPO Business Outreach - The IPO should therefore work with the other innovation bodies, and the Technology Strategy Board, to identify the opportunities to communicate wider innovation support messages and information alongside its IP messages, and to incorporate these into its existing business outreach programme of IP awareness and customer engagement. For example, we envisage that businesses attending the IPO's patent advice events should be able to access advice and information on issues such as standards and measurement at these events
- Recommendation 14 NI6 Challenge Fund to kick start joint working - Again noting that IP is the common thread, we recommend that, starting in

2010-11, the IPO should put up to £1m annually into an 'Innovation Infrastructure challenge pot' which it would administer, and which would offer match-funding to support new customer engagement initiatives from combinations of innovation bodies. Our specific recommendations on how this pot should operate are set out at annex 6.

Recommendation 15 Targeting NI6 services to high tech firms - Proposals for use of the Challenge Pot which seek to communicate the services of the NI6 to this group are given priority. – although not to the complete exclusion of other customer groups

Recommendation 16 Better Website access for customers - A web presence is established on the Business Link website which enables all of the NI6 to be found on the same web page, and from where it is possible to access the individual organisations. A web design specialist should be used to ensure this is done effectively. It will be important to incorporate language which is meaningful to those unfamiliar with the organisations. By End 2010, money possibly from Challenge pot

Recommendation 17 Signposting from each NI6 website

- a) All the websites of the six are reviewed to ensure that appropriate opportunities to highlight the services of the other organisations are taken (by Sep 2010),
- b) Staff in the bodies who deal with enquiries are trained to recognise enquirers who might benefit from signposting elsewhere.(by end 2010)
- c) Improving the ability, opportunity, and responsibility to signpost

Recommendation 18 Building NI6 into successful Business Support products - Further work is done to identify opportunities for the NI6 services to be built into:

- a) Designing Demand and MAS – who are already working closely together to cross refer clients and undertake training. MAS in the West Midlands area already provides some support for standardisation activity.
- b) Innovation vouchers – where there appears to be scope to widen the range of qualifying innovation related services to include NI6- related services e.g. strategic patent searches for market opportunities, metrology problem solving, consultancy support to implement ISO standard for sustainability etc.

Recommendation 19 Customer facing - Joint Branding ?

- a) As the NI6 work more closely together over the next 2 years we should keep “overarching external branding” under review, especially in the light of the Hauser review. The NMS should continue to promote a more joined up brand, encompassing the various labs involved.
- b) That the NI6 partners learn from each other about leveraging their brands e.g. DC and NESTA appear to have a more modern brand image within Government, whilst NMO, BSI and UKAS have strong brands with their traditional user base but may be seen as a bit more old fashioned.

Recommendation 20 A new “One Stop Shop” on Technical Regulation for Companies, Government and Consumers, to support the “compliance journey” and encourage innovation. - NMO should lead a team drawn from the six to review how well web provision meets the needs of those (government, manufacturers, consumers and international interests) wanting to understand compliance requirements, and what improvements could be made. This team could also explore how best to influence future UK and international regulation to secure UK advantage. Report back by end 2010.

Recommendation 21 NI6 Commercial Services - In due course consideration is given to what is the right approach in this area, taking account of the roles of the bodies, and wider policy objectives stressed by the new administration and response to the fiscal climate

Chapter 5: Government customers

Recommendation 22 We recommend development of a shared web presence aimed at Government customers. It should sit on an existing strong „go-to“ website *and contain clear „goal orientated“ content capable of „pulling“ users to use it.* The BIS website would be a suitable home (or the new innovation portal for Govt?). It should be kept up to date, and consideration should be given to the case for aiming for a „KTN for Government“.

Recommendation 23 The “Compliance Offer “in the private sector customer chapter should be equally targeted at government customers (see recommendation 20)

Chapter 6: Economic Evidence

Recommendation 24 Like other parts of the innovation infrastructure, the NI6 organisations need to periodically review their performance and its contribution to broader innovation goals. An analogy might be drawn here with the publicly funded research base, where

the regular publication of scientific performance indicators – based on regular bibliometrics – is supplemented by more in depth reviews of the quality of both people and facilities. This provides policy makers with intelligence – and reassurance – that the research base continues to provide world class outputs. A similar process should be continued within the innovation infrastructure.

The bodies need to continue to assess their relative quality, efficiency and performance against comparable institutions in other countries (where relevant).

Recommendation 25 There is a need to strengthen the evaluation of specific interventions or programmes – regulations, scientific programmes, dissemination and best practice. Although the NI6 activities go much wider than conventional business support programmes, incorporation of some of the intermediate and final output and outcome variables into evaluations might assist future comparability and vfm assessment.

3. Policy making & the BIS innovation infrastructure

3.1 The questions posed

Do we need more shared **strategic purpose**? Are we sufficiently able to work alongside and “deploy” the delivery bodies within the UK’s “innovation ecosystem” to support the Government’s overarching policy and create more of a **coherent system**? For example have we drawn sufficiently upon their expertise in the New Industry New Jobs strategy or in the **emerging technology areas** chosen by Technology Strategy Board? Might **raising awareness** of the national innovation ecosystem - its infrastructure and its connections - itself be a policy objective worth exploring?

The project sought evidence from each body using the questionnaire at Annex 17. Summarised evidence from each body (1-2 pages) is provided at Annex 1.

3.2 Summary

As suspected at the outset, the thrust of the evidence shows that these six organisations have fed into innovation and industrial policy making (contribution to industrial/sectors policies e.g. previous government’s NINJ initiative as an example) in a **disorganised and serendipitous manner (although in some areas, eg copyright, it leads)**. Whilst there are pockets of good practice, these are by no means widespread. In the area of innovation policy making, there was more involvement and good pockets of knowledge in “HQ”, but even here there was a great opportunity for improvement. Although bodies had been involved in developing DIUS’ Innovation Nation White Paper in 2008, they were often not consulted in a timely manner on other issues. There was a clear and definite view that BIS was not a good steward of the innovation system as a whole, failing to strategically analyse or actively manage it **as a whole**. Regional Development Agencies (RDAs) echoed this sentiment.

3.3 Evidence

The most positive example is NESTA, which feels it has influenced the overarching NINJ and innovation frameworks (and some of the sectors) via its strategic level and research input to ex BERR and ex DIUS and now BIS. Design Council feel they have had some success in the innovation, manufacturing and business support areas, while IPO has been comprehensively involved in Digital Britain, marginally involved in OLS, but less strongly integrated into other areas. IPO would like to feed in more systematically to wider innovation policy. BSI has had some success working to support BIS teams in a number of sectors (services, innovation, low carbon) but has had a mixed response across the piece. NMO feels it has contributed to mapping emerging technologies via its work with the Technology Strategy Board on technology road maps and also specifically address measurement issues identified by the community, but feels its current extensive (and expensive) underpinning work is often unrecognised and it has much more to offer in key sectors. It also feels somewhat disconnected from innovation policy making. UKAS and IPO have been

involved in developing legal or quasi-legal frameworks to underpin sectoral performance (e.g. copyright, accreditation of wind power).

Most of the bodies have a relationship with UKTI, and have had the opportunity to feed into their recent work to present the UK's innovation system more effectively abroad.

It is widely felt that we do not consistently draw on other similar bodies either – e.g. the Public Sector Research Establishments or RTOs. (An extract from a recent report about RTOs notes that one of their key roles is “supporting public policy – and increasingly pre-policy debate – through state of the art advice”.)

3.4 Missed Opportunities

It is undoubtedly the case that BIS as a whole has missed opportunities to

- draw on the NI6's hard and soft knowledge of technological and sector trends when identifying policy focus
- draw more systematically and creatively on their expertise during innovation policy making.
- draw on their horizon scanning ability
- draw on their extensive knowledge networks and partnerships
- exploit their strong brands within specific innovating sectors to transmit key messages
- commission them (e.g. rather than private sector consultants) to conduct consultancy work linked to their areas of expertise, although this in some cases may have reflected ambiguities about the basis on which advice was or could be provided (see below)
- commission them to identify where their national systems, frameworks or toolkits could better support policy goals in chosen sectors
- draw on their BIS-linked staffing pool e.g. via secondments, projects
- build strong strategic relationships with the NI6 top teams.
- acknowledge that the soft spread of knowledge around the system (the bees pollinating the jungle) is vital and should be encouraged, even if it requires interactions that may appear as “talking shops”

If this is the case for BIS policy makers then it is likely to be even more true for other departments.

3.5 Barriers

These include

- Policy makers' assumptions that Innovation Directorate will make the vertical and horizontal links happen, via commenting on documents, feeding priorities into bodies' strategic boards etc.
- Innovation Directorate reliance on ad hoc sharing across its own sponsor teams and functions, or on busy senior staff to spot both the strategic and practical level links

- Policy Makers’ reliance on the Technology Strategy Board to make links for them.
- Policy makers’ lack of knowledge about the NI6, their roles and offerings, apart from cursory acknowledgment as BIS delivery partner. Certain lack of knowledge of potential.
- Policy making teams’ lack of a good mix of expertise on science, technology, creative industry issues, understanding how the systems and frameworks can support wider sectors (e.g. service) beyond technology based firms.
- Image of some NI6 members being old fashioned
- Confusion about the “offer” from the NI6 – when is government just another customer? When is Government owning and strategically exploiting the “toolkit”?
- Confusion about the basis on which advice might be sought and whether a commercial transaction would be involved, reflecting the variety of business models among the NI6 (e.g. BSI, UKAS, NEL, LGC delivering public policy functions within private bodies; IPO trading fund; NPL GO-CO)
- Confusion about how the innovation ecosystem fits together and the NI6 role within it. (e.g. positioning of NPL’s pure research work.)
- Constant reviewing of roles of bodies – meaning that they are seen as problems to be “sorted” not capability and capacity to be harnessed. (e.g. see 2005 Brimelow Review of NMO¹). Whilst reviews will happen, policy makers need to see the opportunities to pull the bodies onto the “inside” and get more co-creation.
- Lack of time (or staff resource) to read complex material or build meaningful relationships and
- Too little in the remits of the six to commit them to advancing the wider innovation policy agenda

Feedback from policy officials, bodies and other stakeholders such as RDAs and Technology Strategy Board shows that the above analysis is widely shared. Feedback from the NINJ team and from GO-Science Foresight team indicates they too had spotted the deficit and are already keen to work better with the bodies and to look at how their work can inform and support the next phase of strategic policy design.

3.6 Recommendations

The project team was informed that previous initiatives to encourage NI6 collaboration had foundered due to a variety of barriers, including inertia; imbalances in power or resources; insufficient shared purpose, shared fora being talking shops

¹ NMO was called NWML at the time of the review.

etc, and crowding out by other priorities felt to be more pressing. We therefore looked the type of carrot and stick mechanisms which might ensure our recommendations achieved greater lasting change.

Accountability Measures (= BIS takes collaboration seriously)	Drivers for each body
Ministerially endorsed Annual Mandate	Access Best practice – learn from each other
CE/Chair Accountability to Innovation Strategy Board (or similar)	Louder, more influential voice if larger, coordinated group
Budget only approved when Business Plans reflect mandate & overarching shared strategy	Ability to present separate role as clear part of strategic whole
Portion of (new or current) Budgets for shared activity	Improved customer offer; ability to reach more customers
CEO appraisal & salary linked to shared activity	Ability to piggy back on other bodies" finances
KPIs linked to key shared projects	Lever each others" brands

The common thread is enhanced and more effective two-way communication. This is not a new idea. However, in the past initiatives have not taken root because they have not been sufficiently based on an understanding of the existing or potential demand which they are intended to meet. We have discussed a number of possible ideas with stakeholders and we have support for the following practical proposals. In developing them it will be essential to have clarity about the demand that is being met, and how the proposal is tailored to do that. The proposals are (roughly in order of importance):

<p>Recommendation 1</p> <p><i>A major annual Innovation Mandating Conference where</i></p> <p>a) <i>Senior BIS officials from policy areas such as Innovation, Business, Regions, UKTI, will hear “State of the Nation” feedback from the Chief Executives, Chairs and possibly external trustees from each body and from the Technology Strategy Board. This feedback will be of a high level, strategic and operational, detail. HM Treasury and RDAs also to attend. This gives all attendees the opportunity to „survey“ the infrastructure.</i></p> <p>b) <i>All debate and consider topical wider innovation ecosystem issues and focus on their joint offering as well as their individual offers.</i></p> <p>c) <i>BIS officials then convey strategic and political context and priorities for the next one to three years, and specifically what they want from the NI6. This will then feed into annual and CSR funding discussions. This would probably be held in December or January each year, prior to the issue of annual</i></p>
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funding letters for the next financial year. Innovation Directorate to arrange. (Cost £5K)

- d) *Annual identification and co-creation of strategic themes (often cross-government) where the bodies can play a key role (e.g. with or without Technology Strategy Board.)*

Recommendation 2:

A body of continuing shared activity:

- a) *Innovation Ideas Events – creatively facilitated occasional events to keep restocking the store cupboard with analysis and new policy and delivery ideas across the “silos”. Build partnership and trust and ensure non-traditional thinking is encouraged (i.e. in line with PSI principles).*
- b) *Quick Win Shared projects - create joint project teams, led by the infrastructure bodies themselves, where a topic is already being tackled in many places e.g. Water, metering, sustainability. Then liaise jointly with the relevant policy team.*
- c) *Partnership Commitment - to involve all the bodies in co-creation of policies throughout the year – not just “send them the relevant paragraph of a near final document”. This echoes BIS capability review commitments.*
- d) *A joint programme of Awareness Events within BIS for the whole NI6 group (cf building on innovation visits organised by the public sector team) possibly organised by sector theme e.g. energy, sustainability.*
- e) *A quarterly News-sheet or e-mail letter aimed at BIS policy makers, highlighting key emerging trends, events, and with rolling focus on one partner each quarter. One member of NI6 to lead with content leads in each body from the PR/press functions.*

Recommendation 3:

*A clear **Combined Offer** – in a standardised format – of the different bodies and the strands within them – packaged in a combined folder and then maintained online. This would offer a visual representation of the NI6 and where they fit into the innovation ecosystem.*

Recommendation 4:

*Consider the costs, benefits, competition aspects and potential offer of a “**preferred partner**” **Innovation Consultancy service**, provided by one or more of the NI6 partners. (Not focussing on public sector’s own innovative capacity but providing the sort of services E&Y, Pera do.)*

Recommendation 5:

*Create new **BIS intranet page** on the six bodies and their “offer”.*

Recommendation 6:

***Review BIS Website Innovation content** – look at presentation and linkages to NI6*

Recommendation 7:

*A programme of **secondments** into each relevant policy team, brokered by ID. ID to specify bodies” staffing of BIS projects and supply matching resources from BIS to offset. These could be for a range of lengths from short periods to the sort of longer term secondment arrangement that has been operational with the RDAs for a number of years to fill the BIS policy making post on regional innovation. Secondments could be brokered with wider government including the foresight team.*

3.7 Horizon Scanning & the BIS Innovation Infrastructure

Evidence from the NI6 bodies themselves and from GO-Science’s Foresight Directorate (and Enterprise Directorate Horizon Scanning team), shows that there is **untapped potential** for the bodies to contribute to horizon scanning for both 1-5 year timescales and 10-20 year scans. Indeed some of the bodies (notably NMS) are planning for business needs 10-20 years hence

The bodies have access to - and to differing extents distil - a number of important national and international data sets (e.g. patent filing trends) as well as holding softer customer insight data which could be mined further. Examples of these can be found at Annex 2. Although these data sets are “backward looking” in nature, they can provide the first signs of new technologies, sectoral trends or problems emerging. Indeed the usage or lack of use of the systems is itself an indicator – e.g. low take up in the UK of design rights, or reliance on trade secrets in some sectors, or low usage by SMEs of standards.

As stated above, the knowledge emerging from this data is rarely shared in a regular or systematic nature with policy making teams, who tend to have a 1-5 year horizon. We have suggested various actions to address this. But there is another missed opportunity here: to use the NI6 to look at the 5- 30 year horizon. Whilst the Technology Strategy Board, or the Institute for Manufacturing, produce important “emerging technologies” reports (which draw on the NI6 data to some extent) even they struggle to look beyond the 5 year time frame.

The NI6 has the capacity – because of its “human capital” with deep, long term, internationally well-networked expertise in key areas - to take a longer view. The innovation communities and networks in which the NI6 bodies operate (e.g. NESTA)

can add new insights to horizon scanning, especially on certain topics. Add to this their long term infrastructural, institutional and technological capability – and they have much to offer. The Foresight team, which operates across Whitehall, is keen to tap into this expertise. Other departments which regularly horizon scan, e.g. MOD, may also find it helpful.

Recommendation 8:

*An annual **Horizon Scanning Conference** should take place. This would be more specialist in nature than the Innovation Mandating conference above, involving the research and analysis functions of each body sharing key work and evidence on trends, economic impact. Customers etc. NESTA's research team or the UK~Innovation Research Centre might lead such a conference, working with the GO Science Foresight team, Innovation Directorate and BIS' EPA and RB analysis teams. Costs should be shared across BIS, GO science and partners, with opportunities for sponsorship.*

Timing –by end 2010

4. Private sector customers.

4.1 What did we set out to find out here?

We set out to discover who the actual and potential target customers are for each of the NI6 bodies - and for the system as a whole. We asked whether the customer “front ends” and the signposting between the bodies is arranged so as to optimize access. We asked whether the NI6 were answering questions at the right level of depth, at the right time, and how their advice sits within the wider business support framework e.g. advice from Technology Strategy Board, Manufacturing Advisory Service (MAS) or Business Link. We looked at whether there is a (high level) case for a new business support product covering these areas and who customers might trust to deliver this. We asked about customer journeys to identify how the NI6 interact with their customers.

4.2 Summary

There are good reasons to believe that the potential of the NI6 to support innovation is not being fully realised. The size and character of their shared and individual target markets is not well understood, which makes it difficult to determine whether services are reaching all who might benefit. Awareness of the bodies and their services among those who might use them (in the private sector) is frequently low, and users of one body are often unaware of the others. The six operate largely independently of each other, so that there is no mechanism for communicating a collective service offer (should one be needed or desired).

This matters because, although only a small minority of firms will want that offer, the group who will includes some high-technology SMEs – a strategically important high potential growth group².

In addition with ever more pressure on public spending, the potential for economies of scale for the NI6 as a whole in communicating with customers and potentially offering combined or coordinated services (where possible) need to be explored to ensure that they are optimising efficiency as well as effectiveness.

The wider context of this report is the challenge in the **Smarter Government** White Paper to ensure that all public services are easy for customers to access using optimal customer channels. A specific commitment in the White Paper relates to the digitisation of public services –moving all transactional online with a roadmap to be produced by each Department by December 2010. This built on the Varney report into Service Transformation which first set out the requirement for departments to develop channel strategies including commitments to web convergence and rationalisation and the reduction of avoidable (unnecessary) contact through call centres by 50%. While the work of this report was not specifically designed to address these issues the need to understand the NI6 customer base and how the interact are necessary stepping stones to achieve the aims of Smarter Government.

² See “The vital 6 per cent, How high-growth innovative businesses generate prosperity and jobs”. Albert Bravo-Biosca & Stian Westlake (Eds) Oct 2009[

We make recommendations intended to deepen understanding of the market, to communicate services more effectively, to stimulate new ways of engaging with the market, and to exploit the scope for defining and branding a collective service offer.

4.3 Who are the Private Sector Customers?

Evidence collected from the NI6, from talking to customers and other business support bodies highlighted the sheer variety of the collective customer base, and of the customer journeys. Not unexpectedly UKAS and the National Measurement System's customers showed themselves to be predominantly technology-based – from engineers with multiple roles in family firms to dedicated individuals in „infrastructure savvy“ multinationals like Rolls Royce. The same individuals may also use the patent services of the IPO, which in turn also deals with (tens or) hundreds of thousands of enquiries, particularly from small firms, in sectors such as business services and the creative industries on copyright, branding and design issues. Like the IPO, BSI's customer group also exhibited itself as large and eclectic, from scientists and engineers interested in technical standards to those wanting to achieve compliance or brand differentiation for management processes and service products. The Design Council and NESTA – via their new business support products and innovation field programmes - have fewer customers numerically but across a similar breadth of sectoral fields. Many customers also use the NI6 in a commercial capacity paying for expertise that they offer.

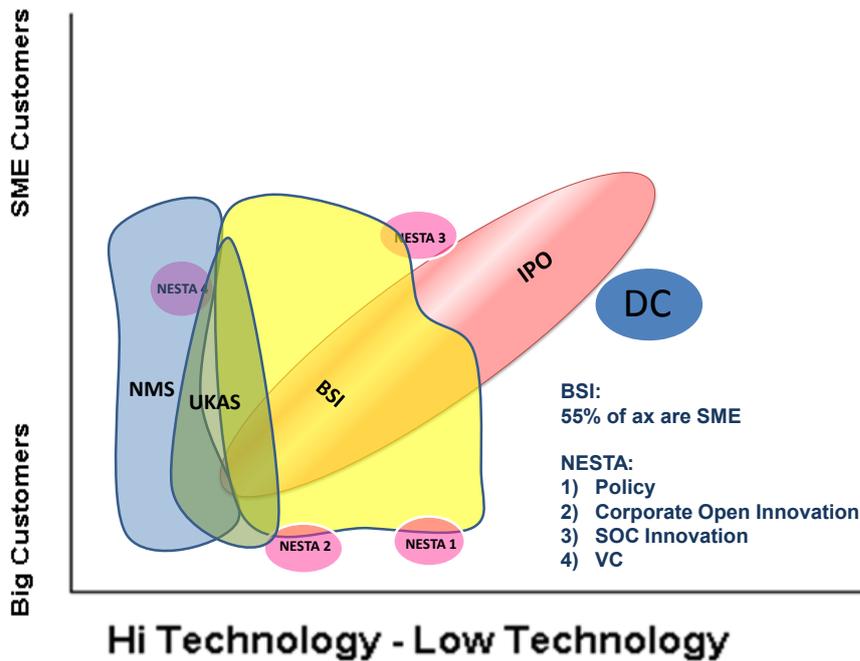
We collected evidence on customer segmentation from all the bodies and tried to present this in common formats. A typical example is below. Others are in the annexes.

Typical Customer segmentation table - IPO

Service	Who are customers	How many	Segmentation	Journey (how they enter system)	Nature of transaction/enquiries
Provision of statutory rights	Businesses from SMEs to multinationals Mostly represented by IP professionals (attorneys) (Segmented as represented and unrepresented)	27,000 patent applications 40,000 trademark applications 126,000 calls to central enquiry unit 1,400,000 unique hits on website	Patents Trademarks Designs Domestic, European or International	Web site Calls to enquiry unit Repeat business from intermediaries (72% patents and 55% trademarks) Web site Other Information lacking Information lacking	Specialist and technical Also scientific for patent applications Customers
Commercial services				Information lacking	
Advice and information				Information lacking	
Tribunals				Information lacking	
Policy development	Government – BIS,	~ 10	Policy advisors, Government officials, Ministers on digital Britain	Repeat customer approach directly networking/stakeholder groups	Specific – Digital Britain, helped in production of report and legislation for Digital economy Bill
Committee chair for Cross Whitehall	Government - DECC	1			
Technical advice – policy	Government – Office for Life Sciences - Ministers	1	Tax and licensing		Development on tax environment for IP licensing – technical advice
Outreach department – programmes and	Businesses Education systems Government				Awareness raising

Service	Who are customers	How many	Segmentation	Journey (how they enter system)	Nature of transaction/enquiries
initiatives	HEIs				
Patents informatics team	Technology Strategy Board		Emerging technologies - KTNs		Tool kit developed

We also tried to look at possible overlaps of customers using axes of “high to low technology” and “large to small” size of firm. We achieved no consensus on this topic and a number of different – and interestingly shaped – diagrams were produced! We concluded that segmenting customers in sectoral terms might be more helpful in considering our recommendations.



We also tried to map, for each body, the interactions with other key stakeholders and customers in a standardised format. The results show a wide range of models of interaction and customer groups, and seek to emphasise the differences between the bodies, historically developed and linked to their very different functions within the innovation landscape. Below is the one from BSI, as an example.



4.3.1 Illustrative Private Sector Customer Profiles

Within this wide spectrum of companies we have developed somewhat stereotypical profiles of the types of individuals who actually make contact with and use the services of the NI6, and other related bodies providing support for innovation. These profiles were developed and floated with the Chief Design Officer of DC and the other NI6 organisations as a way of prompting new thinking about joint offers or new customer needs or journeys. These different stereotypes will also have different “clock speeds” of evolution - covering their product development, process creation or organisational renewal. This may affect their NI6 usage patterns.

a) Small, high tech firms in niche sectors

These included small firms in **the instrumentation, energy, laboratory or engineering sector, biotech, ICT**. They need both shallow knowledge of the NI6 range of offers plus deep knowledge or support at key points, offered quickly. They may have learned about the NI6 during their education or professional or company training. They could also belong to sectoral KTNs or use KTPs, and be involved in regional innovation networks. They might have attended a NESTA technology related event. They tend to belong to trade bodies and trade associations (TAs), may be accredited by UKAS, will almost certainly use technical standards and possibly one of the national measurement systems (e.g. the NPL’s offer of 2 hours of free telephone advice). Some may use new social media e.g. NPL sensors/GPS group. Evidence (e.g. TUVNEL study) showed that they want very focussed, sectorally themed online support and some face to face events, with credible advice from trusted expert sources (use longstanding brand recognition). May get CPD points for attending events. Attend relevant trade shows, read trade magazines. If new or spin outs may get advice alongside VC funding.

A more focussed NI6 offer to these firms could include: better signposting to NI6 from Technology Strategy Board, KTN, BIS and MAS websites, better

signposting to a sectorally themed mix of NI6 offers e.g. all services related to energy/low carbon; coherent marketing of the NMS offer; signposting from TA websites; face to face KTN-based joint event (sectorally themed and more than sum of the parts); “Value from ideas – Innovation Fundamentals ” NI6 training session offered to firms that receive Technology Strategy Board funding or at other key points; focussed joint events hosted at NMS institutes; joint exhibition stands at e.g. Technology Strategy Board Innovation Collaboration event, NMO annual roadshows.

b) Small, creative, low-tech firms

These firms need only enough shallow information about the NI6 services to know they exist and a rough impression of content . For example that BSI offers quality management or service sector standards; that design advice can be accessed via BL, DC or Designing Demand; that IPO offers advice and a helpline on branding, trademarks, design rights, copyright as well as patents. Some of these firms may have attended NESTA events or KTN events for creative industries, or used the British Library IP Business service. Unlikely to look at Technology Strategy Board or BIS websites.

A more focussed NI6 offer could include – joint IPO, DC, Technology Strategy Board and NESTA advice, linked to Creative Industries KTN and various trade associations. Visually attractive joint offer or case studies trailed on new social media sites. Themed area on BL.gov, DCMS, DC websites. Piggy back on existing industry networking or trade show events in large cities.

c) Medium sized established company, engineer – medium technology, manufacturing sector

These firms may use similar advice sources to the small high tech niche firms, but may also use their local Chambers of Commerce or local authority advice as well as relying on their bank and accountant. They may use BSI technical and management standards and be aware of basic IP issues and enforcement tactics (but probably do not use IP tactically or strategically).

A more focussed NI6 offer would be limited here to better signposting separately and jointly from BL.gov, from local business support advisers, or from MAS. A possible new business support product like MAS or DD but “through the lens of IP” could be piloted. Nudging from e.g. BSI towards the other services. Much better awareness of current NMS services (hidden jewel”).

d) Large company employee, specialist in a particular field e.g. quality, measurement, patents

Examples of large high-tech companies already using the NI6 for both “deep and shallow” support include those in the pharmaceutical, energy, aerospace and manufacturing sectors. Company customers include Rolls Royce, GE, ExxonMobil etc. These firms tend to be well served by the current set up and have enough specialist staff to find their way around the system, They use specialist intermediaries e.g. patent agents. They may even shape the systems by sitting on advisory boards. Staff may attend NI6 conferences e.g. NESTA and Technology Strategy Board

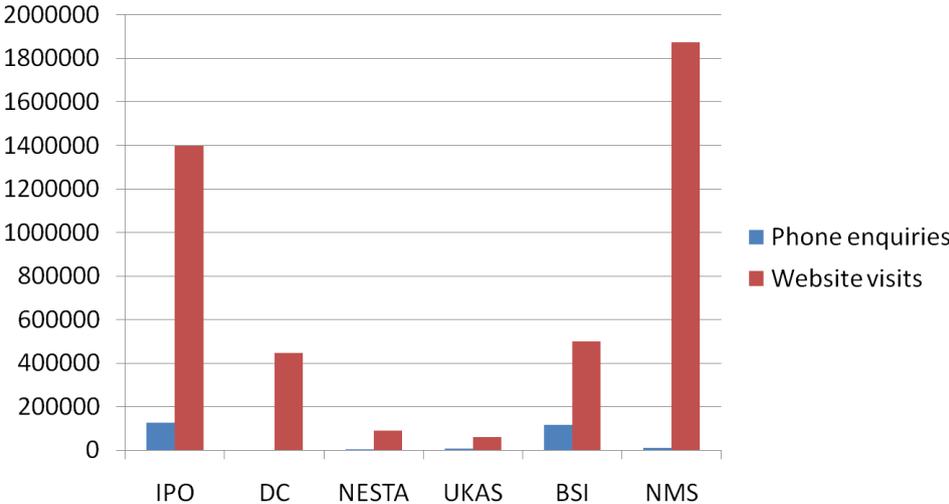
events, and lead KTNs. They operate regional, nationally and internationally and are well networked with universities.

A more joined up NI6 offer (e.g. of training) may help, but they probably do not need it and certainly do not need subsidised support.

These profiles have helped us begin to understand better the customer needs; what services could be attractive and the preferred routes of entry into the system i.e. the customer journey. What prompts customers to even start the journey – e.g. high innovation appetite and absorptive capacity or advice from trading standards? What is the innovation equivalent of a journey via NHS Direct, a consultation with an NHS GP, an NHS consultant, or seeking private sector treatment or well being advice? How to raise awareness of the whole system?

They also prompted us to think about signposting to private sector services (e.g. NESTA are approached by many organisations wanting to work with them, but they steer clear of offering innovation consultancy).

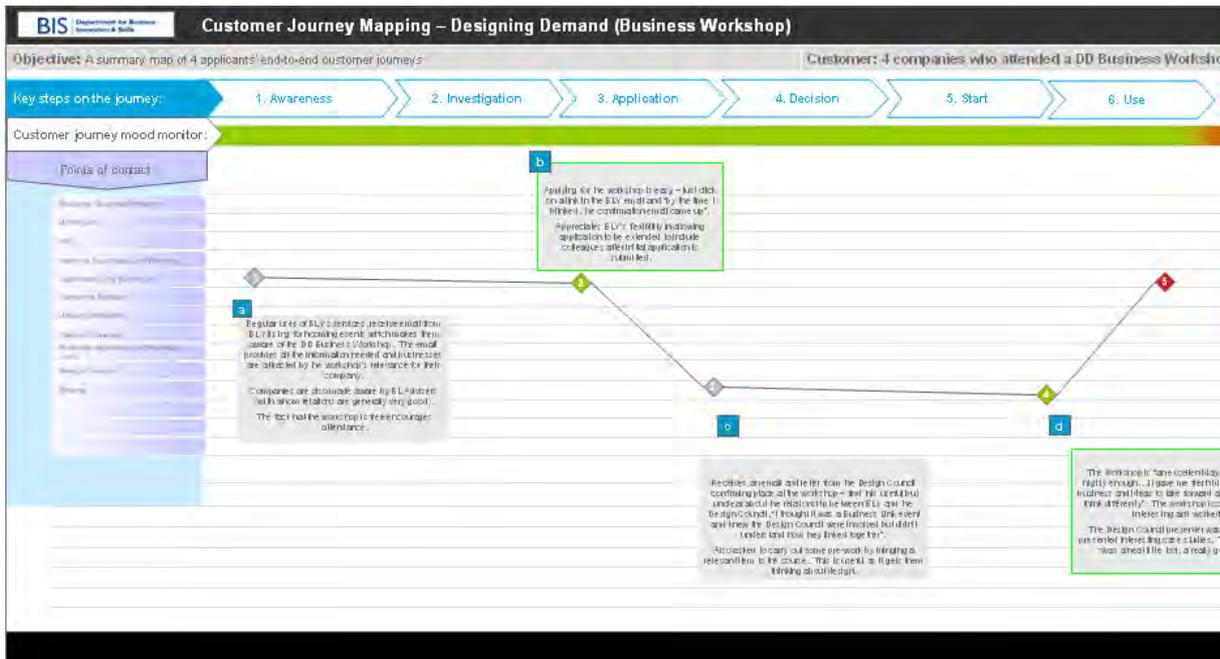
The chart below gives an indication of the numbers of web and telephone enquiries which the bodies receive. Taken together the numbers are large. The implication is that if there is scope to connect the elements of the NI6 offer better then that could make a significant difference.



4.3.2 Customer Journeys

The diversity of customer types is matched by the diversity of the customer journeys to and through the NI6. The profiles above have helped us begin to understand better the customer needs; what services could be attractive and the preferred routes of entry into the system i.e. the customer journey.

We looked at some of the work done by BL.gov on customer journeys, eg with the 30 BIS Solutions for Business, including the DC's Designing Demand programme. We invited the other organisations to produce similar analyses



We received some excellent insight on customer journeys (from an NI6 staff workshop) – and in the annex we show a typical “compliance” journey and a NESTA journey starting at a conference.

We also pulled together charts showing – for each body - the journey of a customer from “low to high” in awareness across to full partnership activity, against product offering. Below we show this chart for the NPL. The customer journey may start with a website hit, move across to some telephone advice and a few customers may reach consultancy or even bespoke products.



Our research has established that, just as there is no shared sense of any common customer group, there is currently no sense of shared responsibility to signpost customers around the system. This suggested to us that the NI6 are missing opportunities to „nudge“ customers towards sources of help they might benefit from but might not otherwise have considered. The customers of the Technology Strategy Board also fall into this category. We tested the concept of “selective nudging” with customers and some intermediaries. We concluded that there was a fine balance between potentially irritating “cross selling” - when all a customer wanted was a precise piece of advice at a key point of need - and seizing an opportunity to address the worrying void of knowledge about the wider system of support. We identified different opportunities and costs (ie practical, financial or in terms of annoying customers) for different “shallow level nudging” around telephone, web and intermediary support channels. We concluded that the key area to “up our game” was in training of innovation intermediaries and NI6 helpline advisers and web information providers.

4.3.3 The Size of the Market

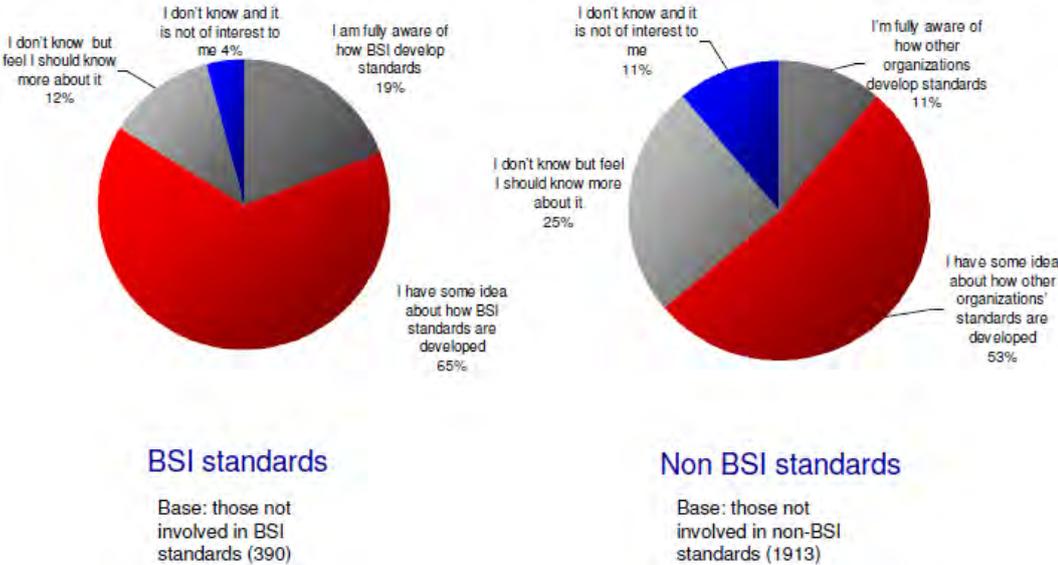
We asked the six to tell us what they thought was the size of the potential market for their services. It appeared that generally they did not think in these terms, focussing instead on providing services which should be helpful to those who found their way to them. There are some good reasons for this, particularly where the services (like the sale of standards or grant of trade marks) are likely to be able to meet all conceivable demand. For other services, such as the Design Council’s successful „Designing Demand“ product for SMEs, the question as to whether it is scaled to the extent of need is more striking. However the underlying issue is the same – the rationale for Government intervention to provide these services implies a wish for those who might benefit to do so, which suggests a need to know the extent and character of the target market(s). Equally without a good understanding of the nature of the customer base it is difficult to ensure the services are being provided in the best way for customers, nor whether there are other potential products and services which could be developed.

4.3.4 Customer surveys

We asked each of the bodies to send us their most recent customer survey data. The table below summarises their response. The respondent types give an indication of sector users and size of customer. It is hard to draw comparisons from across the surveys since they asked different questions in different ways. Results are in Annex 13.

Results cover areas such as “How did you hear about the organisation?” (eg for IPO over 50% heard through external sources such as Google or London Businesslink, but only 20% through IPO marketing, whereas for **NPL** answers included repeat customers/word of mouth, Google, or via other organisations) For customer satisfaction there were some very high scores eg UKAS - 94% satisfied or very satisfied, IPO (2009) – 93% satisfied; NMO 96%.satisfied or very satisfied; for **BSI** – good scores for ease of use of standards satisfaction and BSI processes. There is no single customer satisfaction question available for comparison. There were also questions around communications and quality of websites, with mixed views on the quality of the current offerings. The very extensive recent BSI survey had some interesting scores around customers’ knowledge of standards processes – showing

quite high awareness. It also showed that customers predominantly use standards because of a link with (quasi) regulatory or procurement compliance.



Organisation	Year of survey	Form of survey	Total respondents	Respondent type
IPO	2009	Web based	123	12 out of 17 respondents were IP professionals
IPO	2007	Post Telephone Face to face Online	283 90 51 44 468 total	61% were from small companies (1 – 49 employees) 47% were customers without legal representation
BSI	2009	Website + member email	2155	35% manufacturing based 95% UK based
UKAS	2009	Quarterly web based questionnaire	75	Cross section of customer base Testing Calibration Inspection and certification
NWML	2008-9	Web based	111	78.2% SMEs
NMS	2002	?	55	40% manufacturing 29% non manufacturing 20% consultancy 46% from large companies (>250 employees)
NMS	2005	telephone	1200	NOTE: mix of users and non users
NMS	2006	telephone	370	106 scientists and 264 participants of the <i>Measurement for Innovators (Mfi)</i> programme
NPL (creation of a Knowledge & Innovation Centre on the Teddington site)	2008	Email	290	Business sectors included: Instrumentation, Electronics, Research, Aerospace, Environmental, Advanced manufacturing and Medical devices

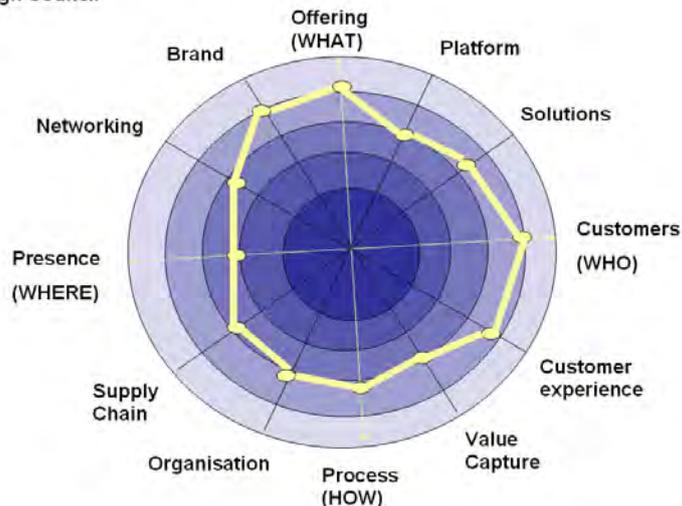
4.3.5 Innovation Radars (see Annex 5)

These were plotted for each of the NI6 using information supplied by each organisation and information provided through their web sites as well as insights gained from customer

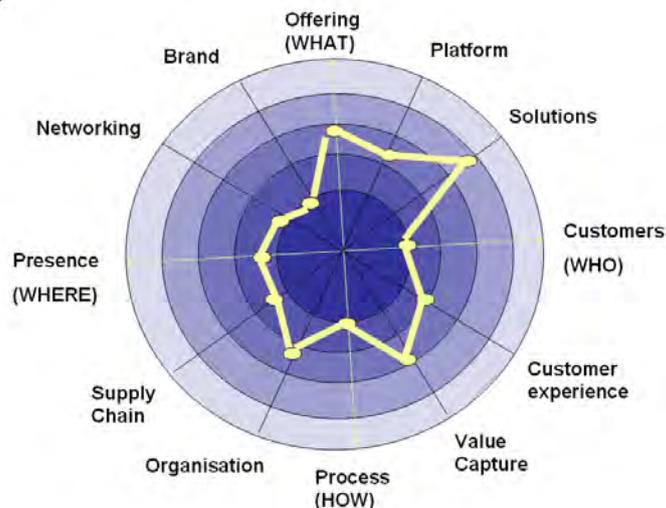
workshops and the online toolkit

(http://www9.kellogg.northwestern.edu/main_admin/servlet/viewsflash?cmd=page&pollid=wolcott!Radar). The radars illustrate the differences between the organisations and provide insight into how innovative the organisations are. For example the Design Council uses innovation in dealing with customers, is solution and innovation focused, seeking out new ideas and approaches (e.g. Designing Demand) and has a wide innovation radar. In comparison, NMO are more traditional and are known for their reliability and steadfastness, relying on their reputation and so have a much smaller radar..

Design Council



NMO



4.4 Innovation Advice and Guidance - The Wider Context

As well as looking at the NI6's offer to customers we looked at how customers mapped onto the wider customer base for Business Link, BL.gov, the Technology Strategy Board, the RDAs and Devolved Administrations and even for university services. We – perhaps naively – looked for existing coherent customer “innovation offers”, against and within which we could reposition the NI6 offer(s). But we found a rapidly developing and confusing picture with, again, little clear evidence about which companies were being serviced or targeted. The post -election future looked even more uncertain. The following summarises the avenues we followed:

We studied the “The Exploit Your Ideas” themed area of the BL website and spoke to RDA innovation contacts. It was clear that whilst there is currently material and some signposting (eg to NI6 websites) available on the BL.gov website (mainly from IPO and NMO) there is scope for re-structuring and more coherence. We also noted the British Library Business and IP Centre offering. That appeared to be meeting the needs of some businesses, though it was not clear that high technology businesses were making significant use of the Centre.

We spoke to RDA Innovation contacts via the RIST Network (including Welsh, Scottish and NI contacts). They felt that the services offered by the NI6 fitted best within their various regional innovation networks and their offer for “high growth” targets. They agreed that regional intermediaries needed more information. Some RDAs were particularly interested in, for example, metrology (eg South West). They referred us to some useful work done in 2005 to segment innovation customers called the Innovation Message – but this work had not been taken further.

We spoke to the Technology Strategy Board, who agreed that there was scope for integrating and signposting advice from the NI6 into their website and those of their 15 KTNs. The Technology Strategy Board is starting to develop its own customer segmentation and journeys, and to study who its users are (eg relative to users of the NMS or other NI6 bodies). The Technology Strategy Board’s Board has recently discussed KTN effectiveness³, knowledge sharing, potential membership numbers (currently 60,000) and possible KPIs. Our provisional view is that there may well be significant overlap between participants in some of the KTNs, and those customers who would benefit from several of the NI6 offerings. Two of the KTNs are run by NPL, and are piloting new ways of working. The KTNs from Creative Industries, Energy Generation, Low Carbon across to Financial Services might all benefit from both shallow and deep support in the areas of metrology, IP, standards and design issues.

We looked at recent CIHE research on how universities best serve businesses. This asserted that currently we know little about the absorptive capacity of different firms in their life cycles. There are few conceptual frameworks available. Those discussed in the academic literature emphasise the non-linear and unpredictable paths that businesses may follow in developing their capabilities⁴. Hence policy makers struggle to judge the appropriateness of different supply side interventions and products and what may be the most valuable in different circumstances. Success may reflect the absorptive capacity of the firm as much as the relevance of the product. CIHE are committed to developing a better categorisation of products against their likely outcomes and to provide an escalator along which companies might travel as they develop a more intensive approach to knowledge exchange. We recommend that the NI6 stays close to this CIHE work and draws on it as single or joint offers are developed.

4.5 What Have Customers Told Us?

We tested and refined the thinking which we developed through research with the NI6 and others by investigating what some of the customers themselves thought. We reviewed customer surveys and feedback supplied by the six, and held two

³ Technology Strategy Board Board Paper 2010-01-05

⁴ Ref: John Bessant review paper written for DTI c. 2005.

facilitated meetings with a selection of customers. We also looked at customer responses to recent consultations eg on the NMS strategy.

Both the written evidence and meetings confirmed that customers value the services of the NI6 bodies they were in contact with and want them to do “more” to support them. For example the metrology trade association BMTA noted that “Knowledge transfer to the providers and end users of measurement services [is key] – there is no point in developing a world class NMS if it is not understood or not used by industry. BMTA members are less concerned with the NMS delivering world class science and measurement leadership than in it providing practical, relevant, accessible and affordable support for their own businesses (and by inference for their clients).” Trade association GAMBICA noted recently that stronger links between the NMS labs and the major instrument manufacturers would help maximise the impact of NMS research and enhance awareness. Trade associations have offered to host an update bulletin on the NMS for their member companies. They also ask for more coordination to raise awareness of the NMS through government as well as industry, including suggesting a marketing facility with board level authority to ensure a coordinated approach to build contacts and awareness.

The meetings with customers tended to confirm that knowledge of the NI6 and their services is not widespread. Given the incomplete knowledge among those with business advice roles (see above) it is not surprising that businesses themselves often lacked knowledge. The customers to whom we spoke frequently knew little of the offerings of other organisations besides the one where they were already a customer.

The meetings also suggested some significant terminological difficulties. Where customers were unfamiliar with the functions of other bodies they were often little the wiser on hearing the bodies’ names. „Innovation” itself seemed imprecise to some, and did not imply the sorts of services the six offer.

We included a question in latest survey of business by the IPO to test further whether there is more scope for the bodies to work more closely together in serving customers. The answers from the first 1,400 businesses to respond (survey not closed at time of writing) suggested that there is.

Please indicate if you would find it helpful for the following related advice and information to be offered with IP advice and information?

	Standards: technical specifications eg BS, ISO	Accreditation: assessment against recognised standards	How design can boost competitiveness	Implementation of legal weights and measures	Total
Yes	496 (34%)	514 (35%)	441 (30%)	238 (16%)	1689
No	397 (27%)	354 (24%)	453 (31%)	571 (39%)	1775
Don't Know	403 (27%)	415 (28%)	382 (26%)	444(30%)	1644

IPO Survey of IP Awareness in Business, March/April 2010

4.6 Innovation Intermediaries

Intermediaries played a significant role in some of the NI6 organisations. They perform at least two functions.

The first is to act as a source of advice for customers about the NI6 and their services. Government and private sector business advisors are in this category. They may provide sophisticated advice on “deep” complex issues at the point of customer need, or simply a signposting role – the shallow level advice on other aspects of the innovation ecosystem as a whole. For example, twenty percent of surveyed callers to the IPO’s enquiry line between November 2009 and January 2010 advised that they had been prompted to call by some form of business advisor.

It is clearly important for advisors to understand the NI6 and to recognise where their services may add value for businesses. Disappointingly, we found that the business advisors employed by, or on behalf of, the government do not find it as easy as they would like to understand what the NI6 do, and how they interrelate. Despite significant efforts over recent years in some NI6 areas (eg IPO, Design) the intermediary system is not showing significant “demand pull” for this information (singly or combined) and the supply side offers have received a patchy response (eg IPO road shows and e-training for advisors).

The Project Team propose that this is an area where significantly more policy emphasis and creativity is needed – whatever the advice landscape becomes in the future. We were advised (eg by Lord Sainsbury amongst others) that working within the (post election) advisory landscape was always the better option than creating new, costly “add-ons” to supplement or go around it.

One approach could be to work with an enthusiastic RDA who understand the business advisors in their patch and pilot some new approaches on a regional basis (eg SWRDA)

Business advisors/ innovation intermediaries who might be potential customers for a single or joined up offer from the NI6 include:

- UKTI Innovation advisers in the UK
- UKTI staff overseas (especially locally recruited)
- Science and Innovation Network staff overseas
- Knowledge Transfer Partnerships advisers
- Business Link Innovation advisers
- RDA Innovation advisers and innovation network organisers
- University Technology Transfer Officers, UNICO, AURIL
- Manufacturing Advisory Service (MAS) Advisers
- Designing Demand Associates
- Hauser Review bodies – e.g. RTO and Technology Institute advisers
- Incubator & Science Park advisers
- High growth advisers in Banks, VC sector etc
- Training providers on Innovation e.g. business schools, universities, Institute for Manufacturing
- Specialist staff in trade associations

As a result of this project we are piloting a joined up “NI6 offer” with UKTI overseas advisers in May 2010.

The second function is to act as agent for firms using the services of the bodies. For example, the majority of patent applications are made and handled by patent attorneys acting on behalf of their clients who are the inventors. These agents normally have a high degree of knowledge in their field, though they may not be well-placed to recognize opportunities for their clients to benefit from other bodies in the system.

4.7 Education & Skills & the NI6

The project identified that all the NI6 bodies hankered after their subject being better covered in school, FE and undergraduate and post graduate university courses. There is evidence that in other countries e.g. Germany, more progress has been made over the last 5 years in embedding e.g. understanding of the role of standards into both engineering and business schools. However, there are many bodies inside and outside Government queuing up to add content to educational curricula, especially in schools, and most are likely to be disappointed. There is a commitment at EU level to do more in this area.

Raising awareness among the current (and future) working population will thus require an active role for the NI6 building on their existing activities. For example, NPL is doing a lot of work on training in basic and advanced metrology, working with firms and universities. Design Council is also working closely with HEFCE and various universities with the Design Skills Alliance to advance understanding of the role of design in economic development and innovation. There is the opportunity to raise profile with students who are the innovators and customers of tomorrow by series of guest lectures about the system or the individual organisations (like NEL did).

4.8 Findings and Recommendations

Recommendation 9:

More knowledge on target markets

As posited at the start of this project, there are good reasons to believe that the potential of the NI6 to support innovation is not being fully realised. The size and character of their shared and individual target markets is not well understood, which makes it difficult to determine whether services are reaching all who might benefit. Despite various economic impact analyses, there is little data on the types of firms who would benefit most from NI6 advice, apart from SMEs obviously suffering from more “market failure” indicators around knowledge “asymmetries”. Given this lack of understanding it would seem highly unlikely that they are. Moreover the difficulty some Business Advisors have in understanding what the NI6 offer is a further reason to suppose that some businesses which could benefit are not being made aware of their opportunities.

This suggests to us that there is a need for work to understand better the markets which the six exist to supply.

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This suggests to us that there is a need for work to understand better the markets which the six exist to supply. The most sensible way to approach this is to start by looking to build in on existing work, such as that recently undertaken by Serco on customer segmentation and proposition testing to inform the development of the Businesslink website. This project led to a model based on the complexity of a firm’s operations, and gave some helpful advice on what terminology resonates with customers (and what does not). NESTA uses customer analysis codes, which it offered to share with the other BIS bodies.

We recommend a business client mapping exercise be conducted, by end 2010, building on work currently being done by the Technology Strategy Board, Business Link/SERCO and by the university sector. This could be co-funded from the proposed NI6 challenge fund (see recommendation 14)

Recommendation 10:

Re-packaging and re-positioning NI6 services for key sectors

We found evidence that a sectoral approach to awareness-raising and selective “sectoral nudging” may be effective given the current make up of customer groups and their enquiries (see stereotypical groupings above). Evidence (eg from NEL survey) shows that time-poor customers value very sectorally focussed support and advice from credible sources. Promotion to companies within certain KTNs is one example of this. Others, from placing copy in sectoral magazines to structuring web offerings sectorally, are worth pursuing.

We recommend that the NI6

- a) *Develop and pilot a shared face-to-face “event” offering for key sectors starting with an event at London Design Week in September 2010 (see annex 20)*

- b) *work closely with Business Link and SERCO as they develop sectorally tailored website offerings (eg new manufacturing pages on BL.gov) and*
- c) *seek to pilot new shared areas on BL.gov (by end 2010).*

Recommendation 11:

Sharing routes to raise overall awareness of other parts of innovation infrastructure

We found that the bodies' markets are very varied, and it is likely that only a small proportion of the overall total will be potential customers for more than perhaps two of the six at any point in time. Nevertheless, the sharing of knowledge about customers, and (subject to data protection requirements) customer details, and of communication channels, represents an obvious opportunity to maximise the value of this information resource to help to address the wider awareness problem around shallow knowledge of the ecosystem. For example, publications and e-circulars produced by individual organisations could carry basic information (and advertising) about the other members of the NI6 and their services.

We recommend co-use of each others' customer bases to increase collective visibility, and that individual communications and marketing departments look at ways of cross marketing. NI6 to report back quarterly to BIS on progress during 2010.

Recommendation 12:

Working more closely with the Technology Strategy Board

The scope to benefit through cross-working with others is not limited to the NI6. There are obvious connections with the work of the Technology Strategy Board and the 60,000 firms on its KTN database. In particular, we might expect firms engaged with KTNs to contain a disproportionately high share of those firms who might benefit from a number of the services provided by the six. These may also be the key high growth firms that Government wants to target. We envisage that the Technology Strategy Board might agree with the NI6 a structured and sectorally tailored engagement with the KTNs, using both the KTN web sites and face to face events, to raise awareness of NI6 services in these sectors. This should go much further than events at which there are 6 presentations and six displays! We suggest that early KTNs on which to focus should include energy, and creative industries.

We recommend that a communications plan (encompassing various innovative joint interventions) to engage businesses within relevant KTNs be devised and carried out in conjunction with the Technology Strategy Board, and supported by a dedicated person in each organisation. The plan should include evaluation and review after a period to assess effectiveness and the case for continuing or expanding the activity. This could be co-funded from the proposed NI6 challenge fund (see below).

Recommendation 13:

Building on current IPO Business Outreach

We noted that the creation of intellectual property is a feature of all businesses' innovation, and the question of how best to protect and exploit this IP arises for every innovator. At the same time IP issues (or indeed design, metrology or standardisation issues) do not arise in isolation for business, but as part of the wider challenge of realising value from innovation.

We recommend that the IPO should therefore work with the other innovation bodies, and the Technology Strategy Board, to identify the opportunities to communicate wider innovation support messages and information alongside its IP messages, and to incorporate these into its existing business outreach programme of IP awareness and customer engagement. For example, we envisage that businesses attending the IPO's patent advice events should be able to access advice and information on issues such as standards and measurement at these events.

Recommendation 14:

NI6 Challenge Fund to kick start joint working

We believe that a practical mechanism to stimulate new customer-focussed ideas and improved, innovative practice would be helpful – indeed that without it little progress would be made in a constrained funding climate. (Lord Sainsbury's recommendations in *Race to the Top* did not lead to very much joint working).

Again noting that IP is the common thread, we recommend that, starting in 2010-11, the IPO should put up to £1m annually into an 'Innovation Infrastructure challenge pot' which it would administer, and which would offer match-funding to support new customer engagement initiatives from combinations of innovation bodies. This could include education-focussed initiatives. Our specific recommendations on how this pot should operate are set out at annex 4.

One important benefit will be in the learning, the shared working and the innovative approaches that this creates for the future, as well as the deliverables themselves.

Recommendation 15:

Targeting NI6 services to high tech firms

We have noted above that there is reason to suppose that there would be particular value in reaching all those firms who might benefit from the services of most of the NI6 (cross ref para above) . We would expect high-technology SMEs to make up a large share of the firms in this category but not yet fully aware of the six – firms that past data suggest have higher than average potential for growth

We recommend that proposals for use of the Challenge Pot which seek to communicate the services of the NI6 to this group are given priority – although not to the complete exclusion of other customer groups.

Recommendation 16:

Better Website access for customers

We have considered the scope to simplify access to the services of the six for customers. In particular we have asked whether there is a case for a single point of entry on the web. We found that there are constituencies who would be likely to find this facility helpful. These include the firms who might benefit from the services of many of the group, and business advisors wishing to understand the range of support available from the bodies. We asked customers at our consultation events to design their preferred web page for NI6 support and many of these ideas could be drawn on (eg a question based decision tree) At the same time the six typically have large numbers of customers, often with developed knowledge of what they are seeking, who wish to go directly to their website. We do not recommend withdrawing any of the existing websites or enquiry services.

However, we do recommend that a web presence is established on the Business Link website which enables all of the NI6 to be found on the same web page, and from where it is possible to access the individual organisations. A web design specialist should be used to ensure this is done effectively. It will be important to incorporate language which is meaningful to those unfamiliar with the organisations. By End 2010

Recommendation 17:

Signposting from each NI6 website

A number of the recommendations above are concerned with directing people to the NI6 from elsewhere. We found that little attention is given by the NI6 to identifying opportunities to benefit customers by signposting them to others among the six where that might assist the customer. Signposting will present different challenges for different organisations. A high proportion of the customers of UKAS or NMO may benefit from the services of other organisations, while the large numbers of copyright and trade mark enquiries to the IPO may imply that a smaller share of these enquirers should be routed elsewhere.

We recommend that

- a) *all the websites of the six are reviewed to ensure that appropriate opportunities to highlight the services of the other organisations are taken (by sep 2010),*
- b) *that staff in the bodies who deal with enquiries are trained to recognise enquirers who might benefit from signposting elsewhere.(by end 2010)*
- c) *Improving the ability, opportunity, and responsibility to signpost*

Recommendation 18:

Building NI6 into successful Business Support products

We did not see a strong case for adding a new NI6-specific business support product to the portfolio – the different aspects of the offer to business from each organisation are different enough to make wrapping into a common package a contrived exercise. A more effective and quicker approach would be to build on existing products and channels (or those currently being tested).

we recommend that further work is done to identify opportunities for the NI6 services to be built into

- a) *Designing Demand and MAS – who are already working closely together to cross refer clients and undertake training. MAS in the WM area already provides some support for standardisation activity.*
- b) *Innovation vouchers – where there appears to be scope to widen the range of qualifying innovation related services to include NI6- related services e.g. strategic patent searches for market opportunities, metrology problem solving, consultancy support to implement ISO standard for sustainability etc.*

Recommendation 19:

Customer facing Joint Branding?

We have looked at the evidence for a joint brand - not to replace the strong and historic current brands, but to link them into more of an ecosystem. The model of the Star Alliance was looked and a few ideas were commissioned from an in-house designer (see below and annex). The Hauser review has concurrently looked at more clearly branding other parts of the UK innovation ecosystem. But we concluded that the key need was for each of the NI6 to work harder at leveraging their current brand to their chosen markets and that a joint logo would be distracting and not very meaningful in the external arena.



Internally within Government, and between the NI6 themselves, it has proved useful to coin the term "NI6", which has helped during the project and could usefully continue. However:

We recommend that

- a) *as the NI6 work more closely together over the next 2 years we should keep “overarching external branding” under review, especially in the light of the Hauser review. The NMS should continue to promote a more joined up brand, encompassing the various labs involved.*
- b) *that the NI6 partners learn from each other about leveraging their brands eg DC and NESTA appear to have a more modern brand image within Government, whilst NMO, BSI and UKAS have strong brands with their traditional user base but may be seen as a bit more old fashioned.*

Recommendation 20:

A new “One Stop Shop” on Technical Regulation for Companies, Government and Consumers, to support the “compliance journey” and encourage innovation.

Customer and NI6 evidence showed that one key customer journey was around compliance with technical regulation. This drove companies to seek advice, purchase standards, seek certification and accreditation, and seek patent advice. This is an area that various previous reviews of NMO (eg Brimelow Review) have highlighted an opportunity to group and market advice in a more customer focussed way, even if this is a virtual grouping rather than institutional change.

We therefore recommend that NMO should lead a team drawn from the six to review how well web provision meets the needs of those (government, manufacturers, consumers and international interests) wanting to understand compliance requirements, and what improvements could be made. This team could also explore how best to influence future UK and international regulation to secure UK advantage. Report back by end 2010.

Recommendation 21:

NI6 Commercial Services

The project found differing approaches to the provision of non-statutory, charged for commercial services, and competition between some of the NI6 organisations. There is certainly evidence that NI6 organisations need to focus on generating income, and this may lead them to focus more on joint NI6 projects which go with the grain of income generation rather than taking opportunities away.

We recommend that in due course consideration is given to what is the right approach in this area, taking account of the roles of the bodies, and wider policy objectives stressed by the new administration and response to the fiscal climate.

5.

Government Customers

5.1 What did we set out to find out here?

We set out to discover what uses Government customers make of the NI6. We asked how well the different needs that they have are met. We explored whether there is scope for a more coordinated offering to Government customers.

5.2 Diversity of Government Customer Roles

There are more sorts of relationships between the NI6 and their Government customers than there are with private sector users. As well as drawing on the six for the same services as they provide to businesses, Government has needs such as support for policy development.

Through our research we developed the following profiling of the Government as a customer.

5.2.1 *Normal Customer.* Government bodies, like companies, use NI6 services to conduct their businesses and advance their objectives. We divided this into three categories:

- Running their businesses, where examples include obtaining BSI standards for purposes such as running Departments more efficiently or procuring ICT, and protecting intellectual property through registration of patents and trademarks.
- Achieving policy and regulatory objectives, including meeting needs for new technology such as instruments (for example the Department of Health's £3m Linac machine, against which all other radiation dosing machines in the NHS are calibrated), for standards to bring about safer and more sustainable products, or for testing services such as those supplied to local government to monitor trading standards by NMO. Using UKAS services to achieve performance and consumer safety goals is another example.
- Stimulating innovation, for example by seeking Design Council and NESTA services to help Departments to become more innovative, or model innovative methods, or catalyse their development by others.

5.2.2 *Policy Customer.* Policy-makers draw on the NI6 for insight, research, legal frameworks, and policy toolkits.

5.2.3 *Contractor.* Members of the NI6 have won contracts to provide services to Government bodies, such as testing services provided by NMO for BIS and DEFRA.

5.2.4 *Proxy customer for the nation.* BIS funds and "purchases" the National Measurement System as part of the innovation and regulatory infrastructure of the UK (see Chapter 6).

5.3 Issues Raised by These Roles

As a *normal customer* Government faces many of the same issues as private sector customers. Awareness of the bodies and their services appears to be higher, as one would expect. Government bodies do not face the same challenges as SMEs, and often have the size, and/or subject specialism, to include individuals who are familiar with the NI6. We did not identify needs that are peculiar to Government users in this capacity, and they share some of the concerns eg about cost of bundles of standards (CLG and the suite of construction related standards).

Some of the bodies eg UKAS, BSI and DC go to some lengths to raise and maintain their profile in Government (eg the BSI/UKAS annual House of Lords Reception; employment of staff whose sole role is to raise awareness; production of marketing materials and magazines aimed at Government.) BSI is developing a Government portal on their website so officials can see which committee work programmes are relevant to them and who is currently purchasing and contributing to the standards world.

The team found that there were strong arguments in favour of better leveraging of the significant funding given to NPL via the NMO into a more widely understood “NPL offer” and that a better description - and clear marginal pricing - of NPL’s “offer” might take us in that direction. NPL made a strong case to the project team to become (alone, not alongside the NI6) the innovation and science “consultancy of choice” for Government, stressing that Government was not making best use of their expertise, knowledge and facilities.

However, when Government engages with the six to pursue *policy and regulatory objectives* navigation of the NI6 offering is not so easy. There may be the initial recognition that a body may be able to help, but understanding who does what within the bodies, and clarifying whether they really can help on a given issue or not, is apparently tricky. A number of those to whom we spoke would like accessible guidance on this, and on organisational structures. There is currently a need to rely too much on personal networks. It was though emphasised to us that once the right contact is made then individuals are normally very helpful. In some policy areas there is an interdepartmental committee (eg the BIS-led committee on standards and accreditation policy) but even here it is hard to get the right people from departments engaged and informed.

Several of those whom we met suggested that the bodies sometimes have conflicts of interest to manage. In cases where one of the bodies is playing a delivery role as part of an attempt to find a solution to a policy issue, policy-makers were not sure how the organisational interests of the body concerned were kept separate from the need for detached assessment of the policy question.

The same applied to Government when engaged in *stimulating innovation*. The importance of being able to „speak in Government’s language“ was noted. This is an attribute which is an asset for all working with or for Government, but which was not felt to be equally present across the six bodies. Generalising, those with stronger communications or policy remit (Design Council, NESTA, IPO to some degree) were felt to be more adept at this. However, policy-makers also noted that they need to avoid mistaking persuasive communication for substance.

We have noted the difficulty Government users sometimes have in navigating the NI6. They also have difficulty knowing where to get help to understand how they can best deploy the bodies' services in order to stimulate innovation. This is not a new issue. Government bodies' desire to innovate is not the same as knowledge about how to use the services of the NI6 to best effect. Several of those whom we met said that they would like to see readily available case studies.

Aspects of the role of Government as *policy customer* are discussed in Chapter 3. Policy-makers frequently have contacts with several of the bodies. For example, we met Home Office colleagues working on „designing out crime“ whose work had brought them into contact with the Design Council, BSI, and IPO. Some advocated a more holistic approach at project start-ups, so that opportunities are recognised early and to avoid differences of view about roles later on. For example, it appeared that there may be opportunities to learn from the widely praised project to develop a pint glass that does not break so that issues such as standards and IP are integrated into the approach from the outset.

Proxy customer. The NMO struggled to get many Government departments to comment on their NMS Strategy last year, but those who did were supportive but wanted better alignment with policy. Some Departments sit on the governance structures for the NI6 as proxy customers for the systems eg a number are members of UKAS' Policy Advisory Committee, Measurement Board, the IPO Board?? .

5.4 Recommendations:

The common thread to the issues identified above is the need for Government users to understand what the bodies do, how to use them, and how to assess the contribution they can make on given topics. Government users frequently have interactions with many of these bodies, and others like the Technology Strategy Board as well. There is a good case for communicating a combined offer which draws together what the bodies do, incorporates case studies which help one to assess relevance to a given issue, and provides a means for the extensive experience of interacting with these bodies to be pooled and shared.

Recommendation 22

We recommend development of a shared web presence aimed at Government customers. It should sit on an existing strong „go-to“ website and contain clear „goal orientated“ content capable of „pulling“ users to use it. The BIS website would be a suitable home (or the new innovation portal for Govt?). It should be kept up to date, and consideration should be given to the case for aiming for a „KTN for Government“.

Recommendation 23

The “Compliance Offer “in the private sector customer chapter should be equally targeted at government customers (see recommendation 20)

6. Economic Evidence

What question were we addressing here?

What does the available evidence tell us about the importance of the innovation infrastructure for the overall performance of the UK innovation system, and may suggest about any scope to secure better value for money in a tightening fiscal environment?

What questions were we not addressing?

We did NOT set out to conduct a prior-options style review of the 6 bodies, nor to look at their status as public or private bodies, nor the scope for mergers with each other or with the relatively recently formed Technology Strategy Board. There have been a number of these type of reviews over the years (some of which we have reviewed) and new Ministers may request more as the fiscal climate tightens and “Smarter Government” demands are faced. We noted the advice of Lord Sainsbury to look – in this study - at the functions and services and their customers, rather than at institutional options. We noted, however, that whilst a few other countries have large “innovation agency” concepts, we discovered no other country which has wrapped its standards, accreditation, metrology and intellectual property infrastructures into such a body.

6.1 The role of the knowledge infrastructure within the UK innovation system

There is a small literature within the (much larger) innovation systems literature that discusses the central role played by the knowledge infrastructure. Unlike the physical infrastructure of a modern economy – ports, airports, roads, electricity and gas, water supply, telecommunications, ICT – the knowledge infrastructure can be difficult to identify. However, it shares some important common characteristics with physical infrastructure:

- Indivisibility – works as part of a system
- Multi-user – many users of the same system
- Large scale (usually) – and usually last for a long time

These characteristics make it difficult for the private sector to set up such infrastructure – it can be difficult to appraise and finance the large and uncertain initial costs. Hence, in most countries, governments or public funding in one or other way have been instrumental in setting up such institutions – although this does not imply they must remain in public management.

The knowledge infrastructure can be characterised as a set of institutions and processes that create and exchange knowledge. This general definition means that it is difficult to set precise boundaries around the concept within the UK innovation

system. Arguably all of the following could be argued to be part of the UK knowledge infrastructure:

- Universities
- Public sector research establishments (PSREs)
- RTOs and other private sector consultancies fulfilling a similar multi-user role
- Knowledge Transfer Networks
- Trade Associations and other similar mechanisms for diffusing best practice
- Standards setting bodies and [technical] regulators
- Foresight and other processes bringing stakeholders together to share future visions

6.2 The role of the NI6 organisations within the knowledge infrastructure

All six organisations can be placed – in different ways – within this broader knowledge infrastructure:

- IPO manages the system of intellectual property rights which is both a protector of intellectual property (and thus incentives to innovate) and a mechanism for the exchange of information around the innovation system
- The NMS is both an originator of knowledge (especially in NPL(classed as a PSRE)) and a conduit for its use, exchange and development through NMS programmes and its regulatory activities
- BSI because standards are a mechanism for both development and dissemination of best practice
- UKAS – because of its role overseeing part of the architecture of technical regulation
- The Design Council – because of its role in promoting knowledge and understanding of the role of design in the innovation process
- NESTA – through its activities in bringing sometimes disparate sources of knowledge and people together and as a source of challenge and experimentation within the innovation system

6.3 Evidence on the economic impact of the NI6 organisations

In a sense there are two issues here:

- With the possible exception of NESTA, the NI6 organisations each have a degree of responsibility for different innovation inputs or processes (e.g. design as an input, standard-setting as a process). Hence there have been attempts to understand – and sometimes quantify - the significance and role of each of these inputs or processes.
- There is then the more specific question of the impact that the specific activities of the NI6 organisations have on UK innovation performance.

Most of the existing evidence we are aware of has concentrated on the first question. Key pieces of work are summarised below:

- Economic impact of intellectual property regime There is a huge academic literature on the economic impact of intellectual property rights. The summary papers included in the report following the June 2009 conference on the

economic impact of IPR are a useful introduction. Nevertheless, large gaps in our knowledge remain, especially where intellectual property is protected through copyright or non-formal means (e.g. speed to market, trade secrecy)⁵. New data from the 2009 UK Innovation Survey provides an indication of the use of IP among UK firms with 10 or more employees: just 6% of businesses said they had produced materials eligible for copyright, 5% said they had registered a trademark and 3% said they had applied for a patent. Given that the majority of UK firms said they were engaged in innovation activity, this suggests that many firms are either choosing non-formal means of protecting their IP or widespread lack of awareness of intellectual property rights (or both).

- Economic impact of standards Secondary analysis of previous UK Innovation Surveys by Peter Swann has shown that standards is one of the more important routes by which technical knowledge generated within the research base is disseminated across the economy. DTI Economics Paper 12⁶ reported research commissioned by DTI into the impact of standards on productivity growth. The research found that the development of the standards framework in the post-War period (proxied by the growth in the number of standards) could be associated with an eighth of overall growth in total factor productivity.
- Economic impact of metrology and the NMS NMO has published analysis based on external research and analysis by DIUS economists that has considered the impact of NMS business-focused metrology programmes. The research by PA Consultants found that participation in these programmes could have an impact on the innovation activity of businesses. Using estimates from other sources about the impact of innovation on productivity, this analysis suggested very significant impacts on GDP in relation to programme expenditure.
- Economic impact of design expenditure UK Innovation Surveys have shown that a significant minority of UK firms report expenditure on design as one of their investments in innovation, .The provisional NESTA Innovation index estimated UK businesses' expenditure on design in 2007 to be £22 billion, some 50% more than estimated R&D. Secondary analysis of previous UK Innovation Surveys suggests that design expenditure is positively associated with productivity growth⁷. .

6.5 Recommendations

The evidence assembled to date leaves little doubt about the significance of the inputs and processes over which the NI6 organisations have stewardship.

Furthermore, there are powerful arguments for public policy having a role in these areas because of its natural role as a regulator and supplier of public goods.

There is scope for further work to be done on understanding the precise impact of the NI6 organisations and their activities on UK innovation performance:

⁵ Ref: IPO/SABIP research agenda.

⁶ DTI Economics Paper 12

⁷ Ref: Haskel analysis reported in DTI Economics Paper 15.

Recommendation 24

Like other parts of the innovation infrastructure, the NI6 organisations need to periodically review their performance and its contribution to broader innovation goals. An analogy might be drawn here with the publicly funded research base, where the regular publication of scientific performance indicators – based on regular bibliometrics – is supplemented by more in depth reviews of the quality of both people and facilities. This provides policy makers with intelligence – and reassurance – that the research base continues to provide world class outputs. A similar process should be continued within the innovation infrastructure.

The bodies need to continue to assess their relative quality, efficiency and performance against comparable institutions in other countries (where relevant).

Recommendation 25

There is a need to strengthen the evaluation of specific interventions or programmes – regulations, scientific programmes, dissemination and best practice. Although the NI6 activities go much wider than conventional business support programmes, incorporation of some of the intermediate and final output and outcome variables into evaluations might assist future comparability and vfm assessment.

7. Taking the Project Forward

7.1 Progress Reporting

We recommend that

- a) the project outcomes are presented to new Ministers and a steer is sought on priority areas; the Challenge Pot etc .
- b) during 2010 a project manager continues to report jointly to the Deputy Director of Innovation Delivery and the DD IPO Innovation Policy to ensure that the recommendations in this report are driven forward. We recommend that a programme is started, made up of the various projects identified, reporting quarterly to an SRO (either John Alty or Simon Edmonds)
- c) Other opportunities are taken, tactically, as they arise, to drive home the new working methods and outlook. The process of undertaking this project has already brought new cross-NI6 alliances, relationships and identified gaps to fill – we hope this will continue.

And finally

This project showed that as well as joining up in key priority areas there are opportunities for the NI6 to learn from each others" day to day strengths and to share approaches to:

- overall strategies and breadth (joint Board events or Council events?)
- use of design and other techniques to support innovative decision making
- marketing, awareness (external, into Whitehall), stakeholder mapping, web/social network channels etc
- communications network (pr teams, press offices)
- evaluation and data (research teams)
- working with shared customer groups/networks/sectors
- legal approaches (legal teams)
- people policies, training, succession planning
- work with schools, FE, HE
- lobbying Brussels, working with UKTI, SIN, OECD abroad (international teams)