

We should talk

Interoperability and the NHS

September 2011



About Intellect	02
Summary	03
Why do we need interoperability?	04
The story so far...	04
The case for NHS investment in interoperability	05
The case for investment in interoperability by suppliers	05
The ITK initiative	07
Review of ITK process	08
Conclusion and recommendations	11

About Intellect

Intellect is the trade association for the IT, telecoms and electronics industries in the UK. Its 800+ members account for over 80% of these markets and include blue-chip multinationals as well as early stage technology companies. Intellect is a not-for-profit and technology neutral organisation.

Intellect Healthcare Programme Mission

- ▶ To develop the UK's capability to support a strong and growing information and technology industry operating in the health and social care sector.
- ▶ To work with policy makers, decision makers and practitioners to facilitate the delivery of improved health and high quality care for all enabled by information and technology.
- ▶ To provide a collective voice for over 260 member companies operating in the health and social care sectors to maintain the industry's reputation and champion its strategic importance to our stakeholders.
- ▶ To use our expertise and knowledge to provide the highest quality of service and intelligence to our members in the health and social care sector, helping them to make the right business decisions to drive growth and profitability.

Our members cover areas such as hardware, software, applications, telecoms and medical devices and offer solutions across the entire health and social care sectors. Visit our webpage for further information www.intellectuk.org/healthcare

Intellect wishes to thank the following members for their contribution to, and review and approval of this paper, especially the principal authors:

Paul Cooper, IMS Maxims
Martin Whittaker, Touchstone Consultancy

Reviewers: Intellect Healthcare Council

Atos Origin
CSE Healthcare Systems
Docobo (honorary member)
First DataBank
IBM
IMS Maxims
In Practice Systems
InterSystems
JAC (honorary member)
Lloydspharmacy (honorary member)
McKesson
Mentis Management
Mott MacDonald
Oracle
PricewaterhouseCoopers
System C
Touchstone Consultancy
Tunstall

For questions or comments regarding this paper please contact:

Jon Lindberg
Healthcare Programme Manager
T 020 7331 2021
E jon.lindberg@intellectuk.org

Interoperability is in some ways the same as house construction in the current market: everybody agrees that we need it but there's not much actually happening. And every central initiative starts off promisingly but peters out in an atmosphere of mutual blame, or worse, indifference. The NHS, through the National Programme for Information Technology (NPfIT), has for the past eight years been trying to ensure that systems interoperate. This programme has had limited success with the NHS still hosting a plethora of legacy systems, most of which are isolated and do not share vital patient information – they do not interoperate.

Against this background, NHS Connecting for Health (part of the Department of Health Informatics Directorate) has developed a new solution to the interoperability challenge: the NHS Interoperability Toolkit (ITK). Intellect welcomes this initiative and the fresh technical approaches that it brings. However, Intellect also fears that ITK's success may be severely limited by some of the not-so-fresh aspects of the approach, especially those associated with education, investment, engagement and inclusion.

Unless these are improved there is a danger that ITK will go the same way as other central initiatives: technically sound, but not able to convince the market, the Trusts as customers and IT companies as sellers, that it is worth the investment.

This paper summarises what ITK is from industry's point of view and the benefits it should bring. It then shows how it may still fail unless the market view of it changes, and how Intellect, Connecting for Health and the NHS should work together to ensure its success.

If ITK progresses as planned, it is likely that we stand on the brink of a new, much needed era of interoperability in the NHS. However, the benefits of this will only be delivered if all parties invest in the most appropriate solutions. This paper seeks to encourage this by:

- ▶ reinforcing the case for NHS investment in interoperability
- ▶ stating the case for investment in interoperability by suppliers
- ▶ positioning the current ITK initiative with respect to the NHS need for interoperability, and showing what it will and will not achieve
- ▶ reviewing the ITK processes and suggesting how they might be improved

ITK offers a golden opportunity for NHS information systems to deliver many of the benefits once promised by NPfIT, but this will not happen unless as much attention is paid to the market as to the technology.

Our specific recommendations are:

- ▶ that CFH and Intellect discuss the different possible models of supplier engagement, how these could be introduced and how we get the NHS more involved with suppliers
- ▶ that ITK becomes a central plank of the NHS Information and Technology Strategies
- ▶ that CFH clarifies the strategic aims of ITK and supports this with a timescale and development roadmaps for ITK, and that sufficient funds are committed to the work
- ▶ that CFH seeks advice of specialist organisations to educate Trusts about the benefits of ITK
- ▶ that CFH adopts a new working model of development and puts openness centre stage
- ▶ that CFH and Intellect discuss how an improved and positive compliance process should be set up

One of the greatest assets of any system of healthcare is information: information about the patient, their clinical history and lifestyle, available treatments etc. Most of this information is held on IT systems where it can be easily accessed by those directly involved with the patient.

But that's the problem: the information is usually held on any number of IT systems, and only a person with access to all the systems can view all the information. Most carers only have access to one system, so how can they get hold of all the information that they need? Either all the data must be sent to the system they are using, or that system must be able to retrieve it when needed. In both cases, each IT system must be able to communicate with all the others.

And not only communicate, but be able to understand and present the information as if it were part of one shared patient record. In IT terms, this requires the systems to interoperate.

Without interoperability no carer can know as much about the patient as they should. Tests are repeated, inappropriate care may be given and hospital stays extended. In short, without interoperability healthcare processes are less effective and the NHS is less efficient.

The story so far...

3.1 The National Programme for IT

The NHS has long known the benefits of interoperability. There are plenty of examples of small-scale interoperability trials both before and outside the National Programme for IT (NPfIT). NPfIT was established nearly 10 years ago to deploy a large-scale, standardised system for all healthcare professionals to use to access a shared, digital patient record. Unfortunately this has not yet yielded the expected benefits. The aftermath of NPfIT is that there is still a plethora of legacy systems, most of which remain isolated and do not share vital patient information – they do not interoperate.

With NPfIT failing to meet its objective of cross-NHS standardised systems, NHS Connecting for Health (CFH) has in effect rewound the clock back to 2002 and started to address the information issues that existed back then, but using the latest technological advances that have occurred in the intervening years. If done properly, this should allow the NHS to progress quickly and ensure that interoperability becomes the norm over the next few years.

3.2 Sharing data locally

Alongside this, there is renewed recognition by the NHS that the biggest gains in healthcare are to be achieved where providers of care share their information across a geographic community. This involves interoperation between IT systems within smaller geographic regions, coherent with where the patient receives their primary, secondary and tertiary care together with social care. With today's NHS focus on making referral more efficient, discharge better informed and providing continuity of care across providers, this has to be supported by an investment in information technology – and in interoperability – in order to improve efficiency and reduce costs.

3.3 The Interoperability Toolkit (ITK)

CFH recognises that there is a significant existing investment across the NHS in perfectly capable information systems. Therefore rather than continuing with the "replace all" strategy of NPfIT, it is far more economical to invest in the creation of a set of standards to enable disparate information systems to interoperate. Thus was born the Interoperability Tool Kit (ITK).

The case for NHS investment in interoperability

The business case for interoperability is well established. Many of the benefits of IT systems cannot be realised without interoperability. A clinician cannot make an effective diagnosis unless he has access to all the relevant information in the patient's record. A hospital cannot improve efficiency unless it can bring all the information about the work of the organisation into one place for analysis. GPs would like to see more details about their patient's hospital stay than they read in the discharge summary. Mobile devices for community nurses are of little use unless they can display the patient's record at their place of treatment, and send the findings back to the main clinical system.

However, what is less well understood is the level of investment required to achieve this.

CFH understands the investment involved, especially after working on NPfIT and the experiences and lessons learnt from that.

But it is not clear that NHS Trusts understand what is required. For too many of them interoperability is seen as a technical IT project. Unless this changes it is unlikely that there will be sufficient investment in interoperability to bring any significant benefits.

Of course, the market may change this. But market forces can take a long time to operate in a complex and highly controlled environment such as the NHS. Without central initiatives – such as ITK – it is likely that there will only be pockets of success.

Therefore Intellect welcomes the ITK initiative, and recommends that it becomes a central plank of the NHS Information and Technology Strategies.

The case for investment in interoperability by suppliers

It is generally accepted that interoperability grows markets. Many of the major developments in IT have come as the result of communication and interoperability – from Ethernet through the Internet to the Apple App Store. There is little doubt that interoperability would bring similar growth in the NHS IT market, as long as there is adequate investment. But that investment must come from suppliers as well as the NHS. The full benefits will not come unless there are either truly open solutions or a single proprietary solution that dominates the market. The latter is unlikely to happen, and the only practical open solution available at the moment is ITK.

However, decades of central NHS initiatives and the recent history of NPfIT have induced an unfortunate tendency in suppliers: “wait until they pay us to do it”. There has been very little supplier investment in IT standards or interoperability unless somebody - a Trust or CFH - was prepared to pay. There were sound reasons for this (see section 7.1 below) but it has to change for interoperability to flourish: the market must encourage suppliers to invest. But they will only do so if they see a medium-term return on their investment.

It is likely that the only way to improve the situation is for suppliers to be engaged more fully, following the recommendations in section 8.1, and for them to be convinced that the NHS will universally implement the 'Connect All' strategy.



6.1 What's different?

There are two major differences between ITK and earlier interoperability initiatives. ITK recognises that:

- ▶ the benefits of interoperability are easiest to achieve, and of proportionally greater benefit, when the interoperability is on a local scale rather than national
- ▶ almost any interoperability is better than none

In order to understand the importance of these points it is useful to show what they mean in IT terms.

Local interoperability

In a perfect world, all information on a patient would be available to any legitimate user anywhere in the country. However, in the majority of cases the most useful information:

- ▶ is the most recent eg, a GP needs to see last week's discharge summary or yesterday's lab results.
- ▶ will have been generated locally eg, by the nearest acute Trust or lab.

From an IT perspective, local is good. Local organisations are used to working with each other, tend to trust each other with confidential patient information and share a common language of care. They may share common systems, and will at the very least know of each other's working practices. One of the hardest aspects of interoperability is making sure that none of the data is open to misinterpretation. This means that every piece of information that could be sent must be defined in such a way that it can never be misinterpreted – a near impossible task. If only local systems are involved it is much easier for users to agree between themselves what information will be sent, its context and what it means. Therefore local interoperability is cheaper and easier to implement.

Any interoperability is better than none

Many people say that interoperability is only worthwhile if all the data can be fully understood and processed by the systems involved. But in the real world huge benefits can be achieved by the electronic communication of information that is not understood by machines, as long as it can be understood by the people using the machines. For example, clinicians have been communicating patient information by fax and email for years. This could be classed as low-level interoperability without any machine understanding. ITK recognises the benefits of this type of communication but also allows the use of more complex interactions, as described in the ITK Maturity Model.

6.2 The ITK Maturity Model

ITK seeks to bring benefits by starting off with the areas that deliver the most for the least effort – a tactical solution to the interoperability problem. It is important, however, that this fits in with a longer term strategic solution that brings the type of benefits originally envisaged by NPFIT. To this end, ITK has published a four level maturity model.

- ▶ **Level 1** – is “plumbing”, the way that information is moved from one machine to another. In the current market this presents few – if any - problems.
- ▶ **Level 2** – “send what ya got” allows users to send whatever electronic documents they happen to have – Word files, pdf documents or glorified email. This is simple, easy to implement, and although the content can't necessarily be understood by the computers, it can be understood and acted upon by the clinicians using the computers.
- ▶ **Level 3** – “semi structured” allows the users to structure some of the information – eg name, address, medication – so it can be understood by the computer, with the rest being designed to be interpreted by the clinician. This starts to allow the data to be processed and analysed, and decisions or recommendations to be made by the systems.
- ▶ **Level 4** – “fully structured” allows all the information to be understood and processed by the system, giving most of the benefits originally envisaged by NPFIT – all data available anywhere and a move to fully automated decision support for the clinical process.

Level 1 is generally proven and accepted. Most of the current interest is around Level 2 which gives limited, though useful, interoperability and if widely implemented would bring great benefits to the NHS.

Level 3 implies much greater investment by suppliers and Trusts. The technology is not entirely proven and the cost benefit balance is unknown. For Level 4 the unknowns are greater, and it could be that this solution would present the same kind of complexities faced originally by the National Programme, and result in the same difficulties. For example, Level 4 would require every system to share a common understanding of all the data items in the patient record, as published in a "Data Dictionary". This does not exist in the NHS at present: the current NHS Data Dictionary exists for a very different purpose, is incomplete and incompatible with much of the current interoperability technology. It is not known how long it would take to rectify this, but without it Level 4 cannot be implemented.

6.3 Is ITK strategic?

Levels 1 and 2 are essentially tactical solutions and should be welcomed as such. The investment required to support them is comparatively small and the benefits are sorely needed.

It is unclear whether the ITK maturity model represents a strategic path to full interoperability. If it does, it needs considerably more development before suppliers can be asked to invest in it. If it is not strategic, what is the strategic direction, and how is it proposed to involve suppliers?

Intellect recommends that CFH clarifies the strategic aims of ITK and supports this with a roadmap.



Intellect generally welcomes the fresh approach to interoperability brought by ITK – the involvement of the users, the engagement with Intellect members...and above all the recognition that systems already installed in Trusts can provide the business benefits associated with interoperability. However, there are areas that Intellect believes could be improved. These are:

- ▶ **engagement with suppliers** – making them part of the solution rather than just the people allowed to comment on it
- ▶ **education** – of commissioners, provider procurement departments and especially the parts of the NHS that have no apparent interest in ITK
- ▶ **compliance with ITK** – and how to make this a positive process rather than a barrier to implementation.

7.1 Engagement

Although the ITK project has put in resource to engage with suppliers, it is becoming apparent that the current engagement model isn't working. Reasons for this include:

- ▶ High Re-engineering Costs – ITK may require major changes to systems, and it is not clear that the ITK programme understands the costs and timescales associated with this. For suppliers there is currently no business case for ITK compliance.
- ▶ Seen It All Before – many suppliers have seen central initiatives come and go over the years and ask "Why is ITK any different?". This causes many suppliers to adopt a "pay us and we'll do it; if not, thanks very much but we'll wait" approach.
- ▶ Wrong Customer – the Trust is the supplier's customers, therefore until Trusts understand and mandate ITK as a requirement, suppliers are unlikely to see a reason to invest.
- ▶ Unproven - ITK has not yet passed functionality, scalability, reusability and performance tests, nor achieved real-world acceptance by any Trust. Therefore it is premature for most suppliers to invest. ITK needs to reach a 'critical mass' of acceptability in order to be successful.

- ▶ Lost Revenue – unless the supplier is in the integration business (e.g. an integration engine vendor) it may be more profitable to sell non-standard, proprietary interoperability solutions. Or the supplier may already have a solution that is better than ITK.
- ▶ Ownership – not having been involved in the development of ITK, suppliers don't feel that they 'own' the solution and view it as yet another standard imposed by CFH.

Against this background, an approach from ITK that says "This is what we've done, please give us comments" will ensure that few suppliers will engage – unless of course there is funding available. There is a feeling amongst suppliers that last year's ITK pilots were accepted enthusiastically while funding appeared to be available, but they do not seem to have generated any momentum. The fact that CFH's ITK Accreditation Catalogue has only contained three entries for the past year appears to support this. Any future funding will encourage suppliers to cooperate, but it may result in no long-term movements in the market.

What can be done?

After many years of reactive and ineffective communication between CFH and Intellect the current willingness to engage is very welcome, but engagement tends to follow the old pattern where it is essentially an information push from CFH. How can this be made more of a two-way process? And although Intellect is pleased to be represented on CFH project boards, there is little evidence this actually produces any real two-way flow of ideas.

There are aspects of this that could be improved relatively easily. Two possibilities are described under Openness and Compliance below.

The key recommendation is that CFH and Intellect discuss the different possible models of supplier engagement and how these could be introduced.

7.2 Education

As stated above, the suppliers' customers are Trusts and not the Department of Health, CFH or the ITK programme. Suppliers respond to what the market demands and at present (with one or two exceptions) Trusts are not demanding ITK compliance. CFH needs to educate the NHS market, not just the enlightened CIOs but the entire Trust board; not just the interoperability enthusiasts but those who couldn't care less about ITK. This must be expressed in terms of the business benefits that can be realised by interoperability, and how an investment in ITK can support this. These benefits should be expressed to:

- ▶ the finance director in terms of financial savings
- ▶ the medical director in terms of improved patient care and improved patient safety
- ▶ the director of nursing in terms of a reduction in administration (form filling)
- ▶ the director of operations in terms of increased efficiencies
- ▶ 'legal' in terms of a reduction in negligence claims

...i.e., in their terms rather than IT terms. Current ITK documentation is full of technical jargon. References in case studies to "SOAP messages" or "Green CDA" will not convince decision makers. But if the business benefits can be proven through targeted case studies then interoperability adoption will be demanded by the business and by leading clinicians.

Neither Intellect nor the ITK programme has the skills and/or resources to mount this type of education programme. We recommend that ITK seeks advice of specialist organisations, possibly with Intellect's help.

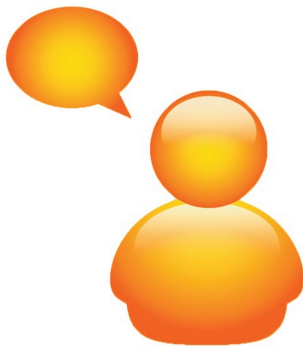
7.3 Openness

Most national and international standards organisations are open to anybody – Trust IT staff, consultants, nurses, suppliers, etc. Input is accepted from any qualified contributor, and many contributors do a considerable amount of the development work. In many cases – such as HL7 and IHE - most of the work is done by suppliers. Indeed, it has been argued that suppliers are the main agents of change in the interoperability world. However, in the world of ITK it is far from clear that input from suppliers is entirely welcome, and there is a feeling that suppliers should only do what CFH invites them to do.

For example, suppliers have no access to the ITK User Forum where ITK initiatives are refined and prioritised. These are then passed to the ITK Technical Forum – which is open to suppliers – but the development work is done by CFH. Perhaps it is no surprise that suppliers, who are generally at the centre of most healthcare IT standards initiatives, feel little involvement.

There is also the curiosity of the Healthcare ICT Portal, host of the ITK Forums. This presents as a commercial body with no clear links to CFH or to standards organisations. Why is the ITK work not hosted by an open organisation or by CFH itself? There is no guarantee that improving the openness of the process will improve supplier engagement, but the current arrangement is currently not conducive to it.

Intellect recommends that CFH adopts a new working model of development and puts openness centre stage. Putting suppliers, Trusts and CFH together in an open and collaborative programme of work to further the development of ITK, will result in much greater acceptance and willing adoption of interoperability standards.



7.4 Compliance

ITK has already become a fragmented standard with the introduction of a layered maturity model. This, by definition, will lead to confusion and obfuscation during Trusts' procurement processes. For example, a Trust may issue a procurement specification that states that the system "must conform to ITK". This is not only meaningless but can be harmful. Since "conformance to ITK" cannot be tested, any supplier can give a positive answer, whether they have wide experience or merely have a single Level 1 implementation of ITK in a single clinic.

There needs to be a much better way of expressing the requirement, testing the response and proving compliance. Part of this is down to education – buyers must know what questions to ask and what the answers mean – but there is a real need for a better compliance process.

Compliance should be a positive process

CFH already operates a number of accreditation/certification processes, such as the testing for conformance to the Care Record Service Spine standards, or the Code of Connection certification for the NHS N3 network. However, these are thought – both inside and outside CFH – to be complex, onerous, too costly, and a barrier to

implementation. This is a common experience of conformance testing: the process is long and expensive and provides little benefit. The ideal process is one that adds value for its participants, improving the quality of the implementation along the way.

There is an example of such a process in the standards world – the IHE Connectathon. Participants bring their implementations to a Connectathon meeting and test them against each other. The results of the process – which systems comply with what standard, which systems interoperate and with what other system – are then published.

The advantages are threefold.

- ▶ The compliance process adds value and experience to the participants' products and implementation teams.
- ▶ Suppliers work together constructively to resolve incompatibilities.
- ▶ Buyers can check to see which products interoperate, and what part of the specification they support.

IHE's actual Connectathon is unlikely to be a suitable vehicle for ITK, but a process using the same principles based around the ITK would be invaluable.

Intellect recommends that CFH and Intellect discuss how an improved and positive compliance process should be set up.

Timescales

Once the strategic direction of ITK has been clarified (see 7.2 above) it is necessary to establish timescales. Suppliers need to develop investment plans and plan product refresh cycles so as to be able to incorporate ITK developments – once they are sufficiently bought-in to the benefits.

The timescales and accompanying development roadmaps must be in sufficient detail, and with sufficient high-level commitment, that suppliers and Trusts have the confidence to invest.

Intellect recommends that such roadmaps be made a key element of the forthcoming NHS Information and Technology strategies, and that sufficient funds are committed to the work.

In conclusion, Intellect welcomes CFH's ITK initiative and believes that it is an excellent start. NPFIT has delivered some successful sharing of patient information (PACS, Choose and Book, Electronic Transfer of Prescriptions and the Personal Demographic Service being notable examples) but they have limited benefit where it really matters, namely the sharing of patients' medical conditions within a local geographic community consisting of a few GP practices, a local hospital, community services and a local authority's social care. If sufficient focus and investment is made along the lines identified by Intellect, ITK will ensure that the information to support local care becomes shared amongst the care providers with the result that patients will receive truly seamless care and, with the efficiency gains, the NHS will be able to make cost savings.

Intellect has identified four main areas for CFH to address if ITK is to be a success.

- ▶ Productive and collaborative engagement with suppliers.
- ▶ Evangelising the benefits of information sharing by educating the business and clinical leaders of the NHS, not just the IT specialists.
- ▶ The most successful information sharing system in the world (the Internet) is based on open systems and open standards. ITK needs to be created using the same principles.
- ▶ ITK compliance needs to be a positive process with an encouragement to succeed, not a barrier to entry.

And more specifically, Intellect recommends:

- ▶ that CFH and Intellect discuss the different possible models of supplier engagement, how these could be introduced and how we get the NHS more involved with suppliers
- ▶ that ITK becomes a central plank of the NHS Information and Technology Strategies
- ▶ that CFH clarifies the strategic aims of ITK and supports this with a timescale and development roadmaps for ITK, and that sufficient funds are committed to the work
- ▶ that CFH seeks advice of specialist organisations to educate Trusts about the benefits of ITK
- ▶ that CFH adopts a new working model of development and puts openness centre stage
- ▶ that CFH and Intellect discuss how an improved and positive compliance process should be set up

Intellect's members do not underestimate the challenges that this paper's recommendations present, but if the recommendations above are fully adopted by CFH, the ultimate goals of "Connect All" and sharing patient data anywhere, will be achieved.

Intellect works with and for members to:

- ▶ develop the UK's capability to support a strong and growing technology sector
- ▶ improve their business performance by
 - providing insights into markets and supply chains and constructively influencing their development
 - engaging with government and regulators to create the most favourable environment for growth and employment
 - maintaining the industry's reputation and championing its strategic importance
 - sharing and promoting best practice

For more information visit www.intellectuk.org

