

e-Government Interoperability

A comparative analysis of
30 countries

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Status of this White Paper

This document is Version 2.0 of the White Paper, published in February 2011. We will keep its contents under review, posting updated versions of the White Paper at www.cstransform.com to reflect the ongoing development of this agenda and comments on this version by users and practitioners.

If you would like to comment on this document please email us at impact@cstransform.com.

1: Introduction

This White Paper updates what we believe is the world's first comprehensive study of e-Government Interoperability Frameworks across the world. This revised version, published in February 2011, has been updated to reflect three major developments since the original research was published in July 2010:

- Publication by the Government of India of a new "Policy on Open Standards for e-Governance" in November 2010¹
- Publication by the European Commission of the new European Interoperability Framework Version 2 in December 2010²
- The initiative launched by OASIS - the global not-for-profit internet standards organisation - to integrate CS Transform's recommended framework on interoperability into its new Transformational Government Framework.

1.1 Context

CS Transform is a consulting business which is committed to helping governments deliver citizen service transformation. As part of that commitment, we are publishing a series of White Papers dedicated to understanding citizen service transformation and how governments can make it a reality. This White Paper forms part of that broader series, which can be accessed at www.cstransform.com. Specifically, it is a companion paper to an earlier White Paper published in November 2009, entitled "Beyond Interoperability: towards a new policy framework for e-Government".

In "Beyond Interoperability", we argued that the e-Government interoperability agenda - despite being espoused by an increasing number of governments around the world, and despite being actively promoted as best practice by organisations such as the United Nations - is failing to deliver on the expectations which many policy-makers in governments have for it.

And we went on to argue for a more holistic approach, which we called the "Policy Framework for Citizen Service Transformation", and which we believe represents a more complete model of the policies, guidelines and standards needed to achieve ICT-enabled transformation than is contained in traditional approaches to e-Government interoperability.

Since publication of our "Beyond Interoperability" white paper, we have had much positive feedback on our proposed Policy Framework from policy-makers around the world -but also requests for additional evidence about the weaknesses in traditional approaches to interoperability.

1.2 About this paper

The research set out in this White Paper responds to these requests for more detailed evidence. We are happy to acknowledge the assistance of Microsoft Corporation in enabling us to do this. Following publication of our initial white paper, Microsoft approached us offering access to a database they maintain, which attempts to keep track of all the standards lists being set and maintained by governments around the world. The database covers 30 published eGIFs, as set out in Figure 1. We have used this centralized dataset of eGIF standards to undertake the analysis presented in this White Paper.

Fig 1: National eGIFs analysed in this White Paper

Australia, Austria, Belgium, Brazil, Bulgaria, Canada, Denmark, Egypt, European Interoperability Framework, Estonia, Ethiopia, France, Germany, Greece, Hong Kong, Hungary, India, Malaysia, Malta, Mauritius, Netherlands, New Zealand, Norway, Philippines, Poland, Saudi Arabia, South Africa, Spain, UK, USA

The paper is in five main parts:

- Section 2 describes our methodology
- Section 3 presents key results of our analysis
- Section 4 focuses in particular on the new approaches which have been launched in Europe and India since publication of Version 1 of this report
- Section 5 sets out our conclusions and recommendations.
- Finally, Section 6 looks at next steps. This section shows how, since the initial version of this White Paper, several of our key recommendations are now being implemented at a global level - and sets out how you can get involved in the process.

¹ <http://egovstandards.gov.in/>

² European Interoperability Framework (EIF) for European public services (http://ec.europa.eu/isa/strategy/doc/110113__iop_communication_annex_eif.pdf)

2: Methodology

There are over 3250 standards listed in the 30 eGIFs reviewed during this analysis. To help bring some order to our analysis of this universe of standards, we have taken the following four-step approach:

1. **Apply an "up-to-dateness" filter.** Specifically, we have selected for the most detailed analysis all those national eGIFs which have been published - or updated - since 2007. There are 17 eGIFs that meet this criterion. Given the pace of change in market and technology developments which we discuss more fully later in this paper, we believe it is sensible to focus on these most up-to-date eGIFs as the best basis for understanding what are governments' current technology standard needs.
2. **Rationalise the lists of standards** in these most up-to-date eGIFs, in order to remove duplication, variations in the naming of standards and variations in versions of the same standard. After rationalisation, the 3250 standards listed in the 17 most up-to-date eGIFs were reduced to 1180 - a 64% reduction.
3. **Analyse the lists of standards** with a view in particular to:
 - identifying the areas of commonality, and inconsistency, between them
 - reviewing the extent of their compliance with CS Transform's recommended criteria for e-Government standards as set out in "Beyond Interoperability"
 - evaluating the extent to which this analysis provides evidence for the three major pitfalls of interoperability which we described in "Beyond Interoperability"
4. **Validating the above analysis** against the older set of eGIFs, by checking that the emerging conclusions from the most recent eGIFs seem to hold good for older ones as well.

Inevitably, a number of assumptions and subjective interpretations have had to be made through this process, but we believe that, together with our own experience in this area, the analytical method is sufficient to support our conclusions.

3: Key results

The findings from this analysis strongly support the approach set out in our "Beyond Interoperability White Paper". In that paper, we argued that most work on e-Government interoperability suffered from three major drawbacks (as summarized in Figure 2 below): over-engineering; lack of focus on government-wide business transformation; and inadequate implementation.

Fig 2: Three common pitfalls in e-Government Interoperability Frameworks³

Over-engineering

Much of the technical content in many eGIFs is at a level of detail which, nowadays, is unnecessary. The market has matured significantly in recent years, so the solutions to many of what were previously seen as technical barriers to interoperability are now 'designed in' to a wide choice of competitive, commercial products. When the UK launched its eGIF, for example, it was an important and market-shaping decision to specify the use of XML for data exchanges and IP for interconnections - but now, in a mature market, the need for such government standard-setting is much reduced. Yet many governments still seek to specify long lists of detailed standards. This over-engineering at the technical level results in three problems, which apply in both developed and developing countries:

- First, unnecessary mandation of standards by governments can distort the market, damaging competition and innovation, especially in areas where technology is still nascent and there are multiple possible standards that could emerge in a particular area.
- Second, where governments mandate use of standards which are not widely used in business and consumer markets, they risk isolating the public sector from the broader technology trends and making it more difficult to join-up services across sectors.
- Finally, a detailed focus on technical standards distracts attention and resources from the harder issues - that is, the business, organizational and cultural barriers which prevent agencies from joining-up services around customer needs.

Lack of focus on government-wide business transformation

Fundamentally, the interoperability agenda is still a technically-driven one. The focus on Enterprise Architecture has helped, but the work on this has been very much shaped by the specific needs of the largest government in the world, the USA. The US Federal Enterprise Architecture (FEA), which many others look to as a model, is very much focused around improving the efficiency of each individual agency (with every federal agency being required to develop its own EA consistent with the FEA), and much less focused on transforming the relationship of citizens with the government as a whole. And in Europe, the debate on expanding interoperability into the organizational and policy layers is right in principle, but in practice is being drowned out by the continued over-emphasis on the technical layer in the EIF. Moreover, the interoperability debate is being carried out separately from much of the real progress that some governments are making to address organizational barriers to citizen service transformation.

Inadequate implementation

Finally, many governments struggle in moving their eGIF from being a written document to a delivered reality. Despite the concerns raised above about the limitations of the interoperability agenda, there is no doubt that it also contains much which is good and useful. Too often though, governments find that a published framework can be difficult to translate into sustained and transformational change in practice.

³ Source "Beyond Interoperability: towards a new policy framework for e-Government", CS Transform Limited, 2010

Below we look in turn at the evidence base for each of these pitfalls which is contained within our latest analysis.

3.1 Over engineering

Our analysis identifies a wide variation in the approaches taken and content included in the eGIFs. At one extreme there are over 700 standards listed in one eGIF (the Netherlands) whereas at the other end one eGIF (Norway) has just 47 entries, with the average being about 150 entries.

Of the standards listed, a relatively small subset appear in the majority of eGIFs, and there is then - as illustrated in Figure 3 - a very long tail of standards which have been selected by only one government, approximately 75% of the total number. Just over a third of the single entries all come from the Netherlands eGIF, but even so this still leaves a large set of standards being specified by one government which other governments see no need to specify.

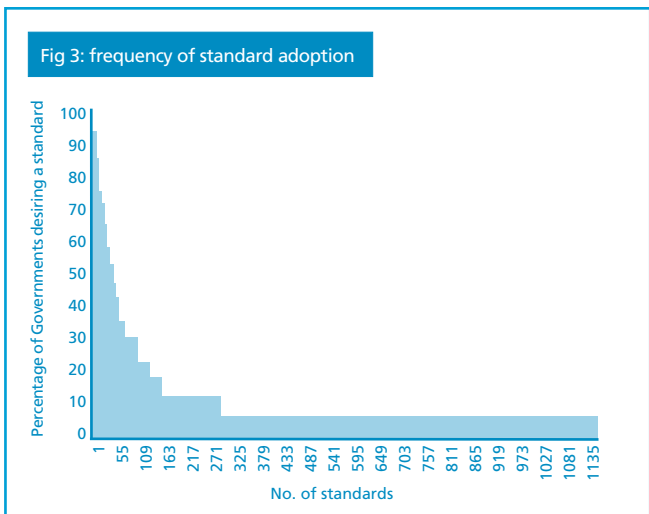
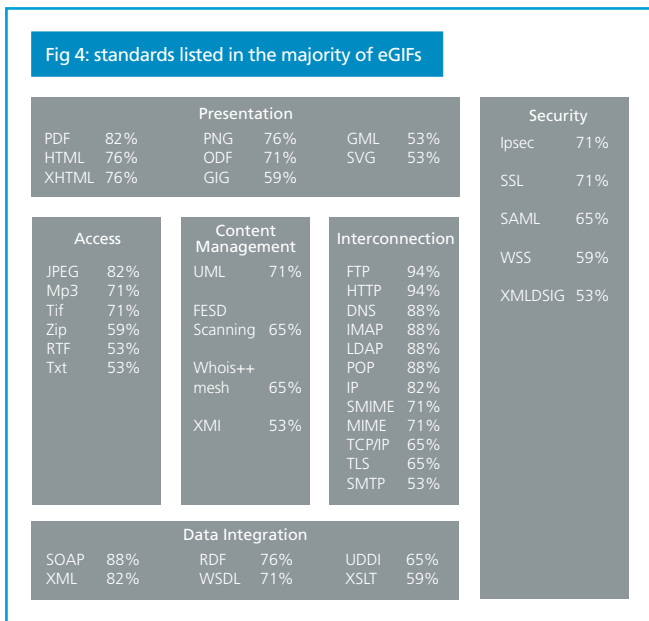


Figure 4 below highlights the most commonly listed standards - those which are contained in at least half of the eGIFs studied.

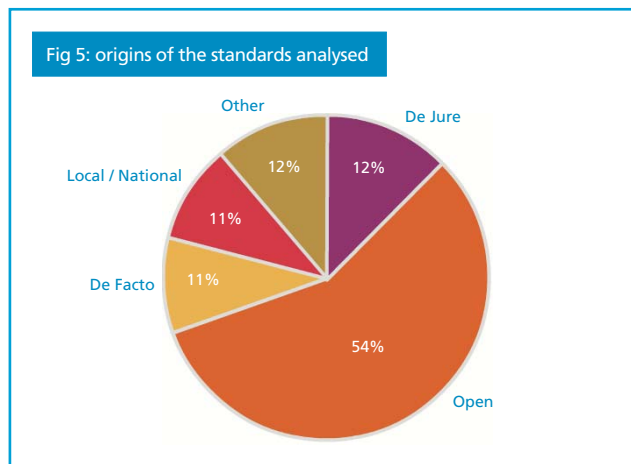


Two points emerge clearly from Figure 4. The first is that these commonly-used standards span all the main technical domains. In a sense, these standards can therefore be understood as representing a "common core" of technology requirements across the global public sector. Obviously, our criterion for inclusion in the standard-set illustrated is an entirely arbitrary one (ie that a standard is listed in 50% or more of eGIFs studied). Extending this parameter would introduce more standards into this set. And indeed there are some strong candidates to be included in any common core eGIF", but which for some reason do not currently appear in most existing eGIFs - such as for example HTTPS, IEEE 802, SQL.

The second point is that the standards are, very largely, "obvious" ones. These common core standards are in effect a fact of life in the marketplace - raising doubts about the extent to which there is a need to invest significant time in developing policy frameworks which specify such standards. In effect, the task is not to create a set of government technology requirements which are different from those used in other sectors, but to align government with private sector best practice. This was true even in the very early days of eGIFs. When the UK Government published its first version, aspects of internet technology were in their early days and so it was necessary then to put some stakes in the ground around a number of emerging industry standards like XML and TCP/IP. But even then the emphasis was on alignment with industry rather than driving industry to create a bespoke set of standards just for the government sector: "the Framework aligns government with the rest of industry"⁴. The value of this approach is three-fold:

- it ensures that government can benefit from a competitive and well-supported market place.
- it facilitates interoperability and service integration between public and private sector service providers.
- and it also ensures that public services use technology which is widely adopted by business and citizens.

We also found a significant variation in the origin of the standards, as illustrated in Figure 5. Around two-thirds of the standards come from either one of the four De Jure standards organisations⁵ or from other Standard Setting Organisations which mean we can consider them to be Open standards (as defined in Figure 6 below). The other third is then split broadly equally between: de facto global standards; local/national standards; and other⁶.



4 "e-Government Interoperability Framework", Cabinet Office, September 2000
 5 Quite a few entries in the eGIFs studied are not standards per se, for example there are references to products, references to methods and/or good practice, references to Organisations, and references to open source implementations of standards. We have classed these as "Other" standards in the analysis results.
 6 ISO, UNECE, ITU and IEC

Linked to this, we found significant variation in what might be termed the "quality" of the standards selected. As a proxy for quality, we assessed the extent to which the standards complied with the five criteria recommended in "Beyond Interoperability" for selecting eGIF standards (which for ease of reference are repeated in Figure 6 below).

Fig 6: CS Transform's recommendations for eGIF standard selection⁷

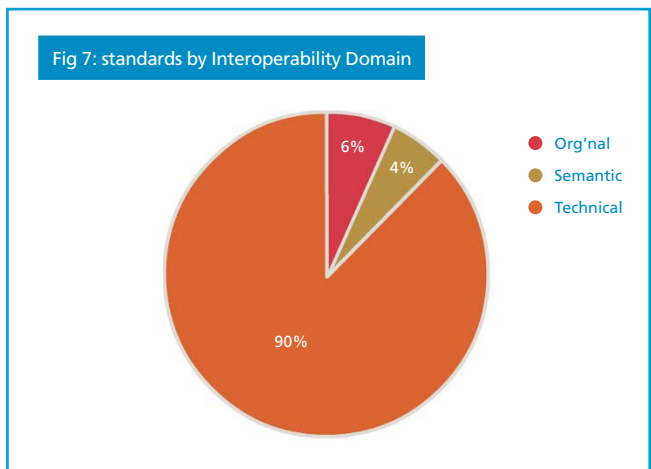
Don't seek to micro-manage the technology market. Only specify the minimum technical standards needed to guarantee a competitive market place and to ensure system and data interconnectivity for your e-Government programme - more than this risks closing off innovation. When you do specify standards, make sure you do so through an inclusive and transparent process which is open to all stakeholders, and aim to select standards which are:

- **Open** - have been developed through an open decision-making process
- **Mature** - have been around for some time and therefore are tried and tested
- **Internationally accepted** - are global in nature and not parochial to any specific country or region
- **Easily deployable** - are openly published (including availability of specifications and supporting material), either with no royalties and other restrictions on reuse, or with any such restrictions offered on reasonable and non-discriminatory terms
- **Well supported in the market place** - a standard is more than a ratified specification, it should have gained acceptance in the marketplace, including a choice of suppliers whose products support the standard and a broad level of adoption by users.

The common core of standards listed at Figure 4 were by far the most compliant with these best practice principles - 85% of them meet the guidelines listed in Figure 6. Of the remainder - the "long tail" of standards illustrated at Figure 2 - only around 65% meet our guidelines, which raises some significant questions related to the utility of these standards and why they have been listed.

3.2 Lack of focus on business change

Our analysis also provides significant evidence for the view that eGIFs largely focus on technical interoperability, at the expense of broader business and organizational issues. Despite the increasing focus - in theory at least - on what the European Interoperability Framework calls "the organizational, legal and political domains of interoperability", in practice the eGIFs we studied focus almost entirely on the technical domain, as illustrated in Figure 7.

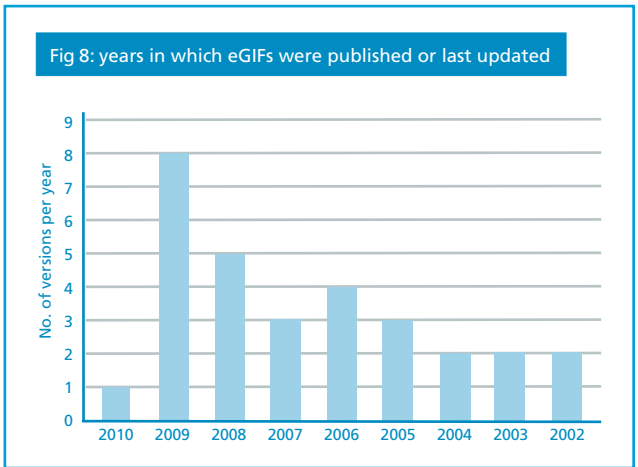


3.3 Inadequate implementation

Finally, the analysis also provides further evidence for the view that eGIFs are often not effectively implemented after publication. We emphasize in "Beyond Interoperability" the need for good governance around the whole e-Government Programme and that applies just as much to eGIFs as it does to other aspects of the Programme. Without an appropriate eGIF governance regime then the initial investment in time and resources will be wasted and effective technical interoperability will not happen. As a caveat, we have not as part of this new analysis attempted to review the implementation or governance regimes associated with the eGIFs being studied; merely the eGIFs themselves.

That said, two significant findings are relevant.

First, it is clear that many governments tend to publish an eGIF and then update it very infrequently or never. Figure 8 illustrates, for the 30 eGIFs studied, the year in which they were last updated (or published, if they have not subsequently been updated). The Hong Kong government updates its eGIF every six months, but this is an exception. Over half of eGIFs are over two years old. This is a serious weakness when operating in an-ICT-based environment, where new standards and new versions of existing standards appear on a regular basis. Unless there is regular maintenance of the eGIFs then inconsistencies and incompatibilities will arise which in turn will increase the difficulties of intra-government interoperability. Even worse, eGIFs that fail to keep up with the rapid pace of change in ICT standards may actually retard progress within government, by restricting government users to aging or out-of-date technology.



Second, the sheer number and variety of standards being listed in eGIFs represents a barrier to effective implementation, because:

- It becomes more difficult to establish the conformance testing programmes which are really essential to delivering effective interoperability. Most Governments and a lot of the standards organisations have not addressed this aspect of supporting eGIFs.
- Compliance becomes more difficult for technology suppliers. Having to support these numbers increases the operating cost for suppliers, and for many smaller, national companies this can mean restricting the market place in which they are able to operate. Even for the larger, global companies the scale and fragmentation of the standards being required by governments collectively represents a significant challenge.

⁷ Source "Beyond Interoperability: towards a new policy framework for e-Government", CS Transform Limited, 2010

4: New developments in Europe and India

Since publication of the first version of this White Paper in July 2010, major new interoperability policies have been launched in both Europe and India. With a joint population of 1.7 billion people, these two areas represent a quarter of the world's population. It therefore seems both timely and important to update our analysis to take account of these developments.

The results are striking. Europe and India share many similarities in an e-Government context: both are large and highly federated, both have mature e-Government strategies developed over a period of time. Yet our analysis shows a very significant difference between the European and Indian approaches to interoperability:

- On the one hand, the new European Interoperability Framework Version 2⁸ represents a very significant shift in the direction of the best practices identified in our White Papers. It sets out a holistic approach for

European interoperability which avoids the common pitfalls described in the previous chapter (some of which had featured in the previous EIF Version 1⁹).

- On the other hand, the new Indian "Policy on Open Standards for e-Governance"¹⁰ risks taking the Indian public sector in the opposite direction, with - we believe - potentially damaging consequences for the Indian government's ability to deliver effective and efficient e-Government services.

A high level summary of this difference is shown in Figure 9 below, which compares the approach taken to standard-setting in EIF Version 2 and the new Indian policy with the best practice approach recommended in CS Transform's White Papers. The European and Indian policy frameworks are then each explored in more detail below.

Fig 9: how the European Interoperability Framework and Indian Open Standards Policy compare with the principles recommended by CS Transform

CS Transform recommended principles	How this issue is addressed in EIF Version 2	How this issue is addressed in the Indian "Mandatory Principles"
Open - developed through an open decision-making process	✓ "All stakeholders have the same possibility of contributing to the development of the specification and public review is part of the decision-making process"	✗ "Identified Standard shall be adopted and maintained by a not-for-profit Organization ..." ✓ "... wherein all stakeholders can opt to participate in a transparent, collaborative and consensual manner."
Mature - has been around for some time and therefore is tried and tested	✓ "In all cases, specifications should be mature and sufficiently supported by the market, except if used in the context of creating innovative solutions."	✗ Not addressed in the Mandatory Principles.
Internationally accepted - global in nature and not parochial to any specific country or region	✓ EIF Version 2 uses the following order of priority: global standards first, then European ones, then national ones.	✗ Not addressed in the Mandatory Principles.
Easily deployable - openly published (including availability of specifications and supporting material), either with no royalties and other restrictions on reuse, or with any such restrictions offered on reasonable and non-discriminatory terms	✓ "The specification is available for everybody to study; ✓ "Intellectual property rights related to the specification are licensed on FRAND terms or on a royalty-free basis in a way that allows implementation in both proprietary and open source software."	✓ "Specification document of the Identified Standard shall be available with or without a nominal fee." ✗ "The Patent claims necessary to implement the Identified Standard shall be made available on a Royalty-Free basis for the life time of the Standard" - where Royalty-Free is defined as "It shall not impose any further conditions or restrictions on the use of any technology, intellectual property rights, or other restrictions on behaviour of the licensee"
Well supported in the market place - a standard is more than a ratified specification, it should have gained acceptance in the marketplace, including a choice of suppliers whose products support the standard and a broad level of adoption by users.	✓ "In all cases, specifications should be mature and sufficiently supported by the market, except if used in the context of creating innovative solutions."	✗ Not addressed in the Mandatory Principles.

8 European Interoperability Framework (EIF) for European public services (http://ec.europa.eu/isa/strategy/doc/110113__iop_communication_annex_eif.pdf)

9 European Interoperability Framework for pan-European eGovernment services, (<http://ec.europa.eu/idabc/en/document/3473/5585.html#finalEIF>)

10 <http://egovstandards.gov.in/>

4.1 The European Interoperability Framework

The initial version of the European Interoperability Framework was published in 2004. It was intended originally as a policy to address the interoperability requirements of pan-European e-government services: ie to ensure that cross-border e-government within Europe could be delivered in an interoperable way.

From the start, much of the EIF approach has been a clear example of the best practices which we have identified in the CS Transform White Papers on Interoperability. Most notably, the EIF has had a very strong focus on the need to understand interoperability as a multi-dimensional problem, not simply a technical one. Indeed, the five domains of interoperability identified in the original EIF - technical interoperability, semantic interoperability, organisational interoperability, political interoperability and legal interoperability - represent a best practice framework which is holistic and which has had a significant influence on interoperability policies across the world.

However, a major concern with the original EIF was that - at the technical level - it recommended an approach to standards selection which we believe was potentially damaging to innovation. As discussed in the previous section, we believe that an effective eGIF is one which does not seek to micro-manage the market at a technical level, but simply aligns government with private sector best practices.

Our "Beyond Interoperability" White Paper identified a set of criteria for selecting standards which we believe embodies this best practice approach. But as can be seen from Figure 10 on the following page, the original EIF diverged from this in some significant ways. We are therefore delighted to see that the new EIF Version 2 has converged significantly on our recommended principles, again as illustrated in Figure 10.

This is against a background in which the current intention is to make the EIF mandatory within all Member States - rather than of relevance only to pan-European services, as previously¹¹. It also reflects a long and inclusive process of consultation managed by the European Commission. The outcome of that process has been a revised approach which is flexible, pragmatic and market-focused.

Key elements of this shift are that:

- The new approach is less restrictive on what sort of organisations can lead standard development, provided their process is open to all to engage in (as recommended in CS Transform's first key principle)¹²
- EIF Version 2 explicitly recognises the need for standards to be mature and well-supported in the market place (as recommended in our second and fourth key principles), in contrast to the more academic approach in EIF Version 1 which did not recognise the importance of maturity and market-support for a standard.

- Critically, EIF Version 2 takes a much less restrictive approach to intellectual property rights, using language which is virtually identical to the third of CS Transform's key principles. The original EIF required all IP in a standard to be made available on a royalty-free basis, and also required that there should be "no constraints on the re-use of the standard". Now however, Version 2 explicitly allows standards to contain royalty-based IP, provided that this is licensed on a "Fair, reasonable and non-discriminatory basis".¹³

To what extent do these changes matter in practice? We believe that the changes are very important. Our analysis suggests that, if put into practice, the restrictive view of "openness" contained in EIF Version 1 would have ruled out 78% of the "Top 40" commonly used e-Government standards identified in our analysis of 30 government eGIFs - because all the major standards organisations typically have intellectual property policies which restrict reuse in ways which is inconsistent with the narrow approach in EIF Version 1.

¹¹ In August 2010, the European Commission set a timetable of 2013 for all Member States to apply the EIF at national level. See: Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, "A Digital Agenda for Europe", com/2010/0245 f/2

¹² EIFv2 Section 5.2.1 the organizational requirements for openness are met where "All stakeholders have the same possibility of contributing to the development of the specification and public review is part of the decision-making process". This language includes a wide range of organizations and groups which currently create specifications and is not limited to the commonly referenced international standards (such as ISO-IEC and ITU) or even regional SSOs (such as ETSI or CEN). In particular, the removal of the "not-for-profit" requirement in EIF v1 signals a significant broadening to include more lightweight structures (including unincorporated entities such as the W3C). This language reflects a pragmatic approach and recognizes that the specifications behind modern ICT are created and maintained in a number of diverse fora, which are subject to a range of different governance rules.

¹³ The language in EIFv2 Section 5.2.1 states: "Intellectual property rights related to the specification are licensed on FRAND terms or on a royalty-free basis in a way that allows implementation in both proprietary and open source software." This appears to be a recognition of the fact that FRAND-based standards can be implemented in open source as well as proprietary software.

Fig 10: how the European Interoperability Framework approach to standard selection has converged on the principles recommended by CS Transform

CS Transform recommended principles	How this issue is addressed in EIF Version 1	How this issue is addressed in EIF Version 2
Open - developed through an open decision-making process	✓ "The standard is adopted and will be maintained by a not-for-profit organisation, and its ongoing development occurs on the basis of an open decision-making procedure available to all interested parties (consensus or majority decision etc.)"	✓ "All stakeholders have the same possibility of contributing to the development of the specification and public review is part of the decision-making process"
Mature - has been around for some time and therefore is tried and tested	✗ Not addressed in EIF Version 1	✓ "In all cases, specifications should be mature and sufficiently supported by the market, except if used in the context of creating innovative solutions."
Internationally accepted - global in nature and not parochial to any specific country or region	✗ Not addressed in EIF Version 1	✓ "EIF Version 2 uses the following order of priority: global standards first, then European ones, then national ones."
Easily deployable - openly published (including availability of specifications and supporting material), either with no royalties and other restrictions on reuse, or with any such restrictions offered on reasonable and non-discriminatory terms	<ul style="list-style-type: none"> ✓ "The standard has been published and the standard specification document is available either freely or at a nominal charge. It must be permissible to all to copy, distribute and use it for no fee or at a nominal fee" ✗ The intellectual property - i.e. patents possibly present - of (parts of) the standard is made irrevocably available on a royalty-free basis. ✗ There are no constraints on the re-use of the standard." 	<ul style="list-style-type: none"> ✓ "The specification is available for everybody to study; ✓ Intellectual property rights related to the specification are licensed on FRAND terms or on a royalty-free basis in a way that allows i implementation in both proprietary and open source software."
Well supported in the market place - a standard is more than a ratified specification, it should have gained acceptance in the marketplace, including a choice of suppliers whose products support the standard and a broad level of adoption by users.	✗ Not addressed in EIF Version 1	✓ "In all cases, specifications should be mature and sufficiently supported by the market, except if used in the context of creating innovative solutions."

4.2 The Indian "Policy on Open Standards for e-Governance"

In November 2010, the Indian Government published its new policy on open standards. In January 2011, it gave initial details of how it plans to put this policy into practice by publishing a list of detailed standards to be mandated in three initial domains (the Presentational & Analytical domain, and the Data Integration and Data Interchange domains).

The stated objectives of the policy are sensible: to facilitate interoperability between systems developed by multiple agencies; to provide agencies the flexibility to select different hardware and software for implementing cost-effective e-Governance solutions; to promote technology choice, and to avoid vendor lock-in. However, CS Transform's belief is that the proposed implementation approach will have serious unforeseen consequences which will damage the effectiveness and efficiency of e-Government in India - and that these consequences are already visible in the initial implementation of the policy which has been published in "Technical Standards for Interoperability Framework for e-Governance in India (IFEG), Phase I".

Our concerns fall into two categories.

First, the new policy represents, we believe, a missed opportunity. Its focus is entirely on technical standards. However, our analysis shows that it is the semantic, legal and organisational barriers to interoperability which are by far the more significant. A broader, more multi-dimensional approach to standards - along the lines of the EIF - would we believe be much more helpful in driving forward delivery of India's ambitious National e-Governance Plan.

Second, looking at the technical approach set out in the new policy, we believe it falls into the common pitfall which we identified in the previous chapter: seeking to "micro-manage" the market. In fact, the Indian policy represents the most extreme version of this problem we have seen in any government in the world.

The Indian policy sets out a number of mandatory principles that standards deployed in the Indian public sector must meet. These are similar - yet more restrictive - to those in the earlier European Interoperability Framework Version 1. As Figure 11 below illustrates, the principles differ significantly from those recommended by CS Transform.

Fig 11: How the Indian "Policy on Open standards for eGovernance" differs from the principles recommended by CS Transform

CS Transform recommended principles	How this issue is addressed in the Indian "Mandatory Principles"	Comments
Open - developed through an open decision-making process	<ul style="list-style-type: none"> ✗ Identified Standard shall be adopted and maintained by a not-for-profit Organization..." ✓ "..... wherein all stakeholders can opt to participate in a transparent, collaborative and consensual manner." 	The Indian policy shares the CS Transform (and the EIF) belief in the importance of an open process for creating standards. But the Indian policy insists on a "not- for-profit organisation" - unlike the much more flexible EIF Version 2,embraces for-profit organisations and also looser, non-formal entities such as the Open Web Foundation.
Mature - has been around for some time and therefore is tried and tested	✗ Not addressed in the Mandatory Principles.	
Internationally accepted - global in nature and not parochial to any specific country or region	✗ Not addressed in the Mandatory Principles.	Many other governments explicitly recognise a hierarchy of standards, recognising global standards ahead of regional ones, and regional ones ahead of national ones. And there is international legal precedent to suggest that this is in fact a legal requirement - but it is not addressed in the Indian policy.
Easily deployable - openly published (including availability of specifications and supporting material), either with no royalties and other restrictions on reuse, or with any such restrictions offered on reasonable and non-discriminatory terms	<ul style="list-style-type: none"> ✓ "Specification document of the Identified Standard shall be available with or without a nominal fee." ✗ " The Patent claims necessary to implement the Identified Standard shall be made available on a Royalty-Free basis for the life time of the Standard" - where Royalty-Free is defined as "It shall not impose any further conditions or restrictions on the use of any technology, intellectual property rights, or other restrictions on behaviour of the licensee" 	Our focus is on ease of access and use on reasonable and non-discriminatory terms - the approach now adopted in Europe under EIF Version 2. But the Indian policy takes a very restrictive approach, allowing neither royalty terms within the standards nor any other restrictions on use.
Well supported in the market place - a standard is more than a ratified specification, it should have gained acceptance in the marketplace, including a choice of suppliers whose products support the standard and a broad level of adoption by users.	✗ Not addressed in the Mandatory Principles.	The issue of market-support is addressed in the Policy, but as a second order issue: one of the "Desirable Characteristics" is : "Open Standard widely used in India for which technical expertise and support exists in India." In other words, a standard which meets the Mandatory Principles but which has no support in the market place should be selected under the Indian policy in preference to one which is widely used but does not fully comply with every detail of the Mandatory Principles

For example, Intellectual Property in the standard must be "royalty free" - defined to mean not only free of royalty payments, but also free of any other conditions or restrictions on reuse. Interpreted strictly, this could rule out all of the commonly used standards adopted by other governments (as identified in Section 3.1 above). It would do so because all major standards organisations have licensing policies which deploy commonly accepted "reasonable and non-discriminatory" such as:

- a prohibition on sublicensing
- a field of use limitation which restricts the patent license to only certain fields contemplated by the standard
- a conformity restriction which effectively says that the license only applies to the extent the implementer has made an implementation that conforms to the specification
- defensive termination of the license if the licensee takes certain actions against the licensor or other licensees.

Such common license terms are clearly intended to be restrictions on reuse of the standard, and hence make the standards non-compliant with the Indian policy.

In practice however, the Indian government seems to be taking a more pragmatic and flexible approach, since its early work in implementing the policy seems to be "letting through" standards that in theory should fail its policy criteria. (Many of the standards listed in the first batch of domains, for example, come from standards organisations which use licensing terms such as those listed above.)

More worryingly the new policy intends to mandate a single standard in each area (ie a single standard for a specific purpose within a technical domain). India is the only one of the 30 governments around the world covered by this study which has adopted such a "single standard" policy. We believe it will be damaging and counter-productive in terms of meeting India's interoperability objectives.

The stated rationale for the "single standard policy" is that supporting multiple Technical Standards "is a very complex task" which "will lead to unstable and unreliable systems."

No evidence is given for this analysis in the Indian policy document, and we do not believe it is correct. On the contrary, ICT is of its nature well able to support multiple standards within a single system, and this is the norm of how the industry operates. By seeking to break with normal industry and government practice in this way, we believe that the new Indian "single standard" policy will create significant problems for the Indian government:

- **The policy will make e-Governance projects more difficult to deliver.** By insisting on one standard in each area, the new policy cuts Indian e-Governance projects from the wealth of solutions which have been developed across the ICT sector to meet a very wide range of different user requirements. For example, the new policy has selected PNG as the mandatory standard for image management, excluding others. For many use cases this will be acceptable, but in others it will not: for example, in the storage of medical or geospatial imagery where high fidelity is vital, the higher resolution TIFF standard is much more appropriate.
- **The policy will prevent the Indian public sector from deploying technology which is widely used by Indian business and citizens.** For example, the new policy will not allow use of the MP3 standard for audio storage, transfer and playback, on the grounds that the standard contains patent rights - even though it is the de facto standard adopted by users across the wider marketplace.

- **The policy may in future be highly vulnerable to legal challenge.** Governments have a duty under international law to remain technology-neutral in its purchasing¹⁴. This means not discriminating between technologies or standards which have equal outcomes. And there is a strong case that the "single standard" policy breaches this legal principle. For example, the Indian policy mandates the use of PNG for image management and excludes the use of the more commonly adopted GIF standard. So in the case of Company A and Company B, which have competing two products which deliver equal outcomes - the former using GIF and the latter PNG - then Company A would be excluded from an Indian procurement under the new policy. And it would have strong grounds for arguing that this was not lawful.

We therefore urge the Government of India to be pragmatic as it starts to put the new policy into practice, and in particular to take advantage of the flexibility given by Section 5 of the policy, which provides that "..... in the wider public interest, additional Open Standard(s) in the same Area may be considered by Gol..." .

We also recommend an early review of the policy's effectiveness and impact, conducted on an open and inclusive basis with a wide range of public and private sector e-government practitioners. A transparent and collaborative governance process of this sort has been the key to success of eGIFs in other countries.

¹⁴ See for example the World Trade Organisation's "Agreement on Government Procurement" (on which India has observer status), which - following the Uruguay round in 1996 - established the worldwide legal framework for procurement on the basis of open transparent and non-discriminatory tendering processes. Article 6 in particular enshrines the "Technological Neutrality" principle.

5: Conclusions and recommendations

Overall, it seems clear that the arguments put forward in our White Paper on "Beyond Interoperability" have been validated and strengthened by the detailed analysis which has been facilitated by Microsoft's help in sharing their database of national eGIFs. The ten best practice principles for driving forward genuine, citizen-centric interoperability which are set out in that White Paper remain, in our view, vital. They are summarised in Figure 12, and can be reviewed in full at www.cstransform.com.

Fig 12: Developing a Policy Framework for interoperable, citizen-centric services - 10 principles for success¹⁵

1. Ensure top-level ownership
2. Focus on business change, not technology
3. Ensure cross-government coordination
4. Map the current environment
5. Prioritise
6. Don't re-invent wheels
7. Promote competition and innovation in the IT supply market
8. Don't assume you have all the skills in-house
9. Drive Change
10. Be prepared for the long haul

In addition, however, we believe that our new analysis highlights in particular three important additional messages for interoperability policy makers:

- Keep it simple
- Keep it current
- Sharing and collaboration is needed at a global level.

5.1 Keep it simple

There seems a strong prima facie case that the real value in the eGIF approach lies in its ability to align public sector IT behind best-of-breed standards and approaches which are already broadly adopted across the wider market. This is what the majority of governments are already doing with the "common core" of technical standards we have highlighted at Figure 4 above. But the value for any government of spending a significant amount of policy time in developing that country's own version of the "long tail of bespoke standards" which is also illustrated in that chart, seems very doubtful.

As we said in Beyond Interoperability, governments should not seek to micro-manage the technology market. They should only specify the minimum technical standards needed to ensure system and data interconnectivity for their e-Government programme - more than this risks closing off innovation. Since version 1 of this White Paper, the European Union has converged on this approach via the new version of the European Interoperability Framework; India, by contrast, risks pursuing an "Island India" policy which isolates it from the mainstream of the global technology marketplace.

5.2 Keep it current

Regular maintenance of eGIFs is essential to the overall goal of technical interoperability. New standards and new versions of existing standards appear on a regular basis and certainly since the first eGIFs started to appear in the early 2000s there has been a plethora of new standards. For example in the Security domain it is only in the last few years that standards like SAML and WSS have really come to the fore and gained true market penetration. Similarly standards like ebXML and UBL are now well established but were hardly being discussed back in 2000. Because of this fast pace of evolution we believe that Governments should review their eGIFs at least every two years and update their lists of standards.

5.3 Sharing and collaboration is needed at global level

There seems to us a strong case for a more collaborative approach to interoperability policy at a global level, for three reasons.

- First, while the eGIFs we have studied may help achieve technical interoperability and e-Government Programmes within national, regional and local Governments, they do not help interoperability between governments. This is because of the sheer range, variety and lack of agreement on versioning which is seen in the standards being used. In today's global world, with freedom of movement and global trading, that can be a very serious drawback.
- Second, there are significant economies of scale that governments could realise if they co-operated more and reduced the variation of standards. If the central task of keeping up to date a core catalogue of technical standards that align governments with industry best practice could be managed collectively, this would free up resources in governments to concentrate their efforts on any further local standards that may be required because of specific needs not shared by others - and also, crucially, on addressing the non-technical barriers to effective e-Government.
- Finally, a more collaborative approach would reduce supplier costs and hence make it cheaper all round to buy standard conformant products.

¹⁵ Source "Beyond Interoperability: towards a new policy framework for e-Government", CS Transform Limited, 2010

5.4 Perspectives from policy-makers

Having tested the conclusions of this report on selected policy makers, we believe they are very much along the right lines (see Figure 13 below).

Fig 13: Perspectives from policy makers

Perspective 1 - United Kingdom:

"One of the things we've learned in the UK is that interoperability 'in the round' is certainly not a problem with a single, simple solution - like making a list of standards. Instead, a complete, long game solution begins with a cold, hard examination of the business change that is required, and then moves to the means by which it will be achieved through persistence over time.

Albeit that making and maintaining lists of technical standards may indeed be one of those means, we have to beware that it does not become an easy distraction activity, used present a picture of action while there is avoidance of the difficult people and process changes that are most likely to be the biggest challenges of all.

Put most directly, clarity of purpose on the customer side, and a competitive and innovative supplier market-place: these are the two keys to success, and they don't get delivered by lists.

Reflecting upon the decade or so since the launch of the UK e-GIF in 2000, and looking to the future, I believe that interoperability continues to be ever more important to the effective use of IT. I see that the public government sector is ever more cognisant of its Siamese-twin roles as a large, significant customer of the private sector IT suppliers and the setter of the wider regulatory and legal environment within which all parties must operate. It's important that both roles work in harmony to apply pressure towards a presumption of interoperability. All parties focusing on delivering the desired business outcomes together will see all the people, process and technical standards/ technology interoperability issues resolved as a matter of course.

In order to maintain momentum, a key challenge for the near future is to understand how best to engineer such an open and collaborative approach to detailed problem solving while respecting the necessity for market competition in supply; but, as I said at the beginning, interoperability in the round is certainly not a problem with a single, simple solution."

Dr Andy Hopkirk

Director of e-GIF Programme, UK National Computer Centre

Perspective 2 - World Bank:

"CS Transform's analysis is very much consistent with our own view on ICT implementation. Often governments put too much focus on technology, and not enough on the governance, business model and change management issues which are really the key to interoperability. Building lists of technical standards is just not as important now as it may once have been - we can simply use open standards that are widely available in the market. Some governments, like Canada, have avoided the eGIF approach altogether and are doing very well without it. As we see it in the World Bank, the value of the eGIF approach lies not in listing the technical standards which are available in the market, but in developing the schemas and use cases for how these will be deployed within government. CS Transform's suggestion that the basic task of keeping up-to-date a catalogue of core technical standards should be managed at a collective, global level is a good one. Many governments are reinventing the wheel in this area - paying consultants to copy some other country's eGIF. So a global reference model eGIF would be a very positive development, enabling governments to focus on the more significant business issues. We in the World Bank would be very supportive of the idea."

Randeep Sudan

Lead ICT Policy Specialist, World Bank

6: Next Steps

The analysis which CS Transform has undertaken so far could form the basis of the global work recommended in the previous section.

In particular:

- Our Policy Framework for Interoperability (which maps out the four key dimensions of governance needed to deliver genuine interoperability in each of the five domains identified by the European Interoperability Framework) provides a framework for gathering best practice which has received significant praise from leading-edge governments since its initial publication.
- At a purely technical level, the "common core" of technical standards identified in this White Paper could form the early basis of work to produce a single catalogue of standards that align governments with industry.

In the first edition of this White Paper, we recommended that one possibility might be for a relevant international body - for example, OASIS, with its mandate to promote e-Government standards and best practices - to provide a forum for this work.

Since then, we are delighted to say that OASIS has taken up this invitation. In September 2010, OASIS launched a new committee focused on "Transformational Government. The aim is to produce a new global open standard on how to develop and deliver a public sector reform strategy, enabled by ICT, which delivers genuinely transformational impacts. In doing so, it aims to build on the work of the European Interoperability Framework, but focusing on how in practice to deliver the sort of citizen-centric and interoperable government envisaged by the EIF.

At the request of OASIS, CS Transform has agreed to make available all of the intellectual property contained in our series of white papers on citizen service transformation as the basis for this new global standard. A major stakeholder consultation workshop co-hosted in Washington DC by OASIS and the World Bank in December 2010 confirmed strong support from government and industry for the key elements of the transformation and interoperability model proposed in those papers, and OASIS is therefore now working to launch an early version of the Transformational Government Framework later in 2011.

If you would like to get involved in this process, please either Email us at impact@cstransform.com
Or contribute directly to OASIS's work on the new Transformational Government standard by visiting www.oasis-open.org/committees/tgf/charter.php.

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