NATIONAL INTEROPERABILITY FRAMEWORK OBSERVATORY

Analytical Model
DENMARK

The content of this Analytical Model reflects the status as collected in 2016.

DIGIT

Directorate-General for Informatics

ISA[2] Programme

ec.europa.eu/isa2

ISA[2]

EIF Element - Reference - Category *See reference: the European Interoperability Framework v2* *See definitions listed in the ISA EIF brochure*	Measurement	NIF element present - Reference - (Text in English)	NIF-EIF alignment scoring 2: fully 1: partially 0: not aligned	Large scale implementation *[describe if and how implementation of the element is a common practice]*	Only implementation **examples** *[describe an implementation example specific to each element]*	Implementa-tion scoring 2: Common practice 1: some examples 0: not observed	NIF monitoring	Monitoring scoring 2: Monitored 1: Partially monitored 0: not observed
		NIF-EIF Alignment		**NIF implementation**			**NIF monitoring**	
Subsidiarity and proportionality Ref: EIF, Chapter 2, Underlying principles Category: Principles	Does the NIF contain the 'subsidiarity and proportionality' principle?	A general principle of the Danish public administration is the "residual responsibility principle" giving individual organisations responsibility for everything not regulated at a more central level. There is also a principle regarding a sound business rationale to any it-solution which covers some of the same ground. IT architecture should respect the principle of subsidiarity, which means that decisions should be taken at the lowest possible political / administrative level. Business needs should drive and define solutions See http://arkitekturguiden.digitaliser.dk/node/792	2	This is implemented by the governance structure, where cross governmental (mostly consensus based) decisions and agreements secure that central initiatives and regarding common standards are agreed upon.	The municipalities in Denmark have their own Architecture Advisory board. This board is responsible for the governance coordination and review of the architecture of cross-municipal projects in relation with the crass-municipal common architecture .	2	The Steering Committee for Data and Architecture has the responsibility for governance of the cross governmental interoperability architecture (NIF). This includes review of crossgovernmental projects and relevant coordination of review processes across the governmental governance tiers. The Steering Committee for Data and Architecture with representatives from ministries, municipalities and regions is responsible for governance, including coordination and monitoring, of the common, cross governmental eGovernment architecture and related initiatives within the eGovernment strategy. Similar responsibility is handled within the municipal sector and the regional sector and on the organisational level.	2
User-centricity EIF, Chapter 2, Underlying principles Category: Principles	Does the NIF contain the 'user-centricity' principle?	There is a specific principle in the NIF: "Citizens and business enterprises should be the focus". There is generally a strong focus on usability in the approach to online services. The strategy is focused on making public services easier to use for everyone. There is a set of national guidelines for self service solutions. These are part of the so-called wave plan regarding mandatory self-service for citizens and business. See http://arkitekturguiden.digitaliser.dk/node/94	2	The focus now is on screening the mandatory self service solutions. Tools for involving users as well as for gathering feedback from users and gathering statistics are provided for service providers. There is a set of mandatory guidelines and tools for self service solutions. See http://arkitekturguiden.digitaliser.dk/node/685	Mandatory self service solutions on The national portals borger.dk and virk.dk are developed and approved according to a common set of guidelines. The portals provides user-statistics. Reports on user involvement.: http://www.rigsrevisionen.dk/publikationer/2013/12013/ and http://www.rigsrevisionen.dk/publikationer/2013/12013/1501-14/	2	All mandatory self service solutions are required to undergo the common public user test. Reference: https://myndighedsnet.virk.dk/integration/krav/faellesoffentlig-brugertest It is also a focus area for The National Audit Office	1
Inclusion and accessibility EIF, Chapter 2, Underlying principles Recommendation 2 Category: Principles	Does the NIF contain the 'inclusion and accessibility' principle?	Accessibility is an explicit part of the principle of user centric development. There is a parliament decision and a formal agreement between the state, regions and municipalities that states the WCAG standards as mandatory. See http://arkitekturguiden.digitaliser.dk/node/659 NIF element text: Citizens and business enterprises should be the focus	2	Good self-service is one of the key initiatives of the eGovernment strategy. As part of the self service, accessibility is a mandatory requirement. There is a set of mandatory guidelines and tools.	The national guidelines for accessibility: http://www.digst.dk/Moedet-med-borgeren/It-tilgaengelighed They are widely implementeed including all the mandatory self services on the portals borger.dk and virk.dk.	2	All mandatory self service solutions are required to undergo the common public user test. Reference: https://myndighedsnet.virk.dk/integration/krav/faellesoffentlig-brugertest It is also a focus area for The National Audit Office	2
Security and privacy EIF, Chapter 2, Underlying principles Recommendation 3 Category: Principles	Does the NIF contain the 'Security and privacy' principle?	Security has been a primary concern of the Danish NIF since the inception of the White Paper on IT Architecture in 2003. All EU legislation on privacy and security is fully implemented and it is mandatory for all state organisations to comply with the ISO 27000 family of security standards. It is voluntary for the regions and municipalities. See http://arkitekturguiden.digitaliser.dk/node/101 NIF element text: Information security from start to finish	2	In 2013 The National Agency for Digitisation published guidelines for tools to assist implementation of ISO 27001 and for Privacy Impact Assessment.	Guidelines for implementing information security: http://www.digst.dk/Informationssikkerhed/Vejledninger-om-sikkerhedsarbejdet	2	The National Audit Office is monitoring state agencies.	1
Multilingualism EIF, Chapter 2, Underlying principles Recommendation 4 Category: Principles	Does the NIF contain the 'Multilingualism' principle?	The Danish NIF is seen predominantly as a domestic effort and since DK is not officially multilingual, multilingualism is not prominent. However, the national citizen portal borger.dk and the business portal virk.dk both have English language section with information as forms / self service. Many public agency websites have sections in English and a number of home pages support ethnic minority groups with relevant information about public services. There is no explicit NIF element but it is part of central national infrastructure solutions. The previous digitisation strategy mentioned a Base Registries ("grunddata") project, in the new strategy this is not mentioned. There is however a basic-data initiative on digit.	1		The national citizen portal borger.dk and the business portal virk.dk both have English language section with information as forms / self service. Many public agency websites have sections in English and a number of home pages support ethnic minority groups with relevant information about public services.	1	*No monitoring*	0
Administrative simplification EIF, Chapter 2, Underlying principles Category: Principles	Does the NIF contain the 'Administrative simplification' principle?	The NIF underscores that administrative simplification, efficiency and reuse of data are very prominent goals in the Danish digitisation efforts. This is reflected in several of the principles. The current strategy states an improvement for citizens and businesses by more efficient public services. See http://arkitekturguiden.digitaliser.dk/node/95 NIF element text: Processes should be optimized for digitisation	2	A number of laws and regulations have been simplified in order to make things easier and save money for both private business and government. The government has set up a forum with business representatives in order to suggest simplification. Reference: http://erhvervsstyrelsen.dk/virksomhedsforum	Contracts for apprentices can now - after recommendation from the business forum for simplificaton of laws and regulations - be handled digitally, thus no longer requiring mail by postal service.	2	The National Audit Agency monitors administrative simplification. The latest report/note provides an assessment of the impact of simplification on businesses: See: http://www.rigsrevisionen.dk/publikationer/2007/706/1103-14/	2

		NIF-EIF Alignment			**NIF implementation**			**NIF monitoring**	
EIF Element - Reference - Category	Measurement	**NIF element present** - Reference - (Text in English)	**NIF-EIF alignment scoring** 2: fully 1: partially 0: not aligned		**Large scale implementation** [describe if and how implementation of the element is a common practice]	Only implementation **examples** [describe an implementation example specific to each element]	**Implementa-tion scoring** 2: Common practice 1: some examples 0: not observed	**NIF monitoring**	**Monitoring scoring** 2: Monitored 1: Partially monitored 0: not observed
Transparency EIF, Chapter 2, Underlying principles Category: Principles	Does the NIF contain the 'Transparency' principle?	The NIF does not contain a specific transparency principle. Openness and transparency permeates the general approach in Denmark. The Self-service requirements mention a good service should guide a user and should provide continuous feedback to the user during the process and should have logical course of action in the design and flow of the service. See http://arkitekturguiden.digitaliser.dk/godselvbetjening/kravbanken/Design-og-flow In Denmark, open access to data (PSI) and a very user centric approach contribute to transparency. In 2013 the Danish parliament passed a new law that put extra emphasis on openness and transparency (Offentlighedsloven). See https://www.retsinformation.dk/Forms/r0710.aspx?id=152299 NIF element text: 'Anyone can request to be notified of the documents received or created by an authority, etc. in the context of administrative proceedings relating to its business. The previous digitisation strategy mentioned a Base Registries ("grunddata") project, in the new strategy this is not mentioned. There is however a basic-data initiative on digest.	2		Transparency is part of the fundamental concept for development national citizens portal borger.dk, which is constantly being improved with new features and content in order to provide transparency. Supported by common requirements to build a good self-service with guidelines for design and flow and user feedback. See http://arkitekturguiden.digitaliser.dk/godselvbetjening See http://arkitekturguiden.digitaliser.dk/godselvbetjening/den-gode-proces/Efter-udvikling	The Danish Citizens portal borger.dk provides a personalised page which in 2015 includes an overview of personal health data and housing data as well as an overview of digital power of attorneys and a log of the use of the page. The portal also provides a general feed back form to the user. In the new strategy period the plan is to expand the overview to include status on personal cases and services.	2	This is part of the practice of The National Audit Office. Recent report include usability, user involvement and user tests. The audit office are also advocating for at broader and more general use of the guidelines for mandatory self service solutions. See: http://www.rigsrevisionen.dk/publikationer/2013/12013/ and http://www.rigsrevisionen.dk/publikationer/2013/12013/1501-14/	2
Preservation of information EIF, Chapter 2, Underlying principles, Recommendation 5 Category: Principles	Does the NIF contain the 'Preservation of information' principle?	The NIF does not contain a specific principle regarding "Preservation of information" as this is already implemented in general administration law (Forvaltningsloven and Offentlighedsloven). The Danish National Archives act mentions "The authorities must ensure the safeguarding of archival interests, including records stored in a safe way." See https://www.sa.dk/wp-content/uploads/2014/10/Arkivloven-lovbekendtgoerelse-nr-1035-af-21-aug-2007.pdf In 2013 the Danish parliament passed a new law that put extra emphasis on openness and transparency. https://www.retsinformation.dk/Forms/r0710.aspx?id=152299	2		The provisions on public records applies to all activities carried out by the public administration and the judiciary. Denmark is taking part in the EU project E-ARK Reference: http://www.eark-project.eu/ There is also a guideline for municipalities See https://www.sa.dk/wp-content/uploads/2014/10/Vejledning-aflevering-arkiveringsversioner-kommunale.pdf	The Danish National Archives preserve data from Danish public authorities. The Danish National Archives ensure that authorities arrange and transfer their records in a condition that renders them useful to future users of the archives. Reference: https://www.sa.dk/aflevering-arkivet/strategi-bevaring-af-digitalt-skabte-arkivalier	2	This is part of the practice of The Danish National Archives. Authorities must notify new systems as described in Section 2 to the State Archives by no later than three months before the system is implemented. For systems that have already been approved, notification must be made in connection with significant changes, including 1) change of registration system for systems with documents 2) significant changes in the system's area of application, including in conjunction with changes in the responsible authority 3) significant changes in the registration component's structure and content for systems with documents 4) full or partial transition to digital archiving of documents. See https://www.sa.dk/aflevering-arkivet/statslige/anmeldelse-godkendelse-it-systemer	2
Openness EIF, Chapter 2, Underlying principles, Recommendation 6 Category: Principles	Does the NIF contain the 'Openness' principle?	The NIF contains the principle "The It-architecture should strengthen competition and innovation through openness". The NIF also contains the EIF openness principle in several other respects, e.g. regarding citizen centric solutions (Openness and accessibility are major concerns in the Danish guidelines for mandatory self service.), common EA methodology, sharing of data and open data, the use of open standards and open source software. See http://arkitekturguiden.digitaliser.dk/node/97	2		The present cross governmental strategy for digitisation focuses very much on sharing data including sharing of open data, and has several specific initiatives with at very wide coverage. There is a parliament decision as well as an agreement between the government and the regions and municipalities to use open standards in order to secure interoperability. Reference: http://www.digst.dk/Servicemenu/English/IT-Architecture-and-Standards/Open-standards	The basic-data initiative (Grunddata) is a large scale initiative to increase the exchange of data between public organisations and sharing these with the public sector. Reference: http://www.digst.dk/Home/Servicemenu/English/Digitisation/Basic%20Data The cross governmental collaboration portal http://digitaliser.dk support collaboration , sharing and reuse.	2	Architecture has the responsibility for governance of the cross governmental interoperability architecture (NIF). This includes review of cross-governmental projects and relevant coordination of review processes across the governmental governance tiers. These review processes are currently in development. The focus is very much on the sharing of data and openness and use of open standards is part of this. The Basic data initiative is under strict governance by a cross-governmental steering committee. There is also close dialogue with the private sector in order to be better able to support private business needs. The governance structure in relation to Grunddata: See: http://www.digst.dk/Arkitektur-og-data/Grunddata/Organisering	2

Analysis of the NIFs

EIF Element - Reference - Category	Measurement	NIF element present - Reference - (Text in English)	NIF-EIF alignment scoring 2: fully 1: partially 0: not aligned	Large scale implementation [describe if and how implementation of the element is a common practice]	Only implementation examples [describe an implementation example specific to each element]	Implementa-tion scoring 2: Common practice 1: some examples 0: not observed	NIF monitoring	Monitoring scoring 2: Monitored 1: Partially monitored 0: not observed
			NIF-EIF Alignment	**NIF implementation**			**NIF monitoring**	
Reusability EIF, Chapter 2, Underlying principles, Recommendation 7 Category: Principles	Does the NIF contain the 'Reusability' principle?	Focus on the revised NIF is on sharing and reuse of data. The existing principle is included in the NIF: "Data and services should be reused." This both regards the reuse of data, open source software and components such as national infrastructure solutions. The National guidelines for it-procurement in the state has a principle, which states that solutions which have already been procured or developed must be reused as much as possible. This principle is part of the mandatory project management tools for the state.	2	The present cross governmental strategy for digitisation focuses very much on sharing data including sharing of open data, and has several specific initiatives with at very wide coverage. The reusability principle is also implemented via the collaboration platform digitaliser.dk which contains a catalogue of public data, a catalogue of data definitions (XML schemas) and a open source repository. See http://data.digitaliser.dk/	The basic-data initiative (Grunddata) is a large scale initiative to increase the exchange of data between public organisations and sharing these with the public sector. Reference: http://www.digst.dk/Home/Servicemenu/English/Digitisation/Basic%20Data The cross governmental collaboration portal http://digitaliser.dk support collaboration , sharing and reuse.	2	The Steering Committee for Data and Architecture has the responsibility for governance of the cross governmental interoperability architecture (NIF). This includes review of cross-governmental projects and relevant coordination of review processes across the governmental governance tiers. Reuse is part of this. The Basic data initiative is under strict governance by a cross-governmental steering committee. There is also close dialogue with the private sector in order to be better able to support private business needs. The governance structure in relation to Grunddata: http://www.digst.dk/Arkitektur-og-data/Grunddata/Organisering That National Audit Office look into the national guidelines for it-procurement in the state, including the principle, which states that solutions which have already been procured or developed must be reused as much as possible. See: Recent report "Note to the Public Accounts Committee report on the management of state digitization projects" from the National Audit Office. http://www.rigsrevisionen.dk/publikationer/2008/22008/a407-12/ The governance structure in relation to Grunddata: http://www.digst.dk/Arkitektur-og-data/Grunddata/Organisering Example: Recent report "Note to the Public Accounts Committee report on the	2
Technological neutrality and adaptability EIF, Chapter 2, Underlying principles, Recommendation 8 Category: Principles	Does the NIF contain the 'Technological neutrality and adaptability' principle?	The existing NIF mentions: "The IT architecture should be open and thus enhance competition and innovation ". The principle is inherent in all cross governmental initiatives. This has been a cornerstone since the Whitepaper on It-architecture in 2003 put SOA in focus as a common cross governmental architecture strategy. Open standards and open architectures, that allow expansion and integration of new software components, are the basic foundation for interoperability - and thus business cooperation and development in the public sector. Focus today is on common standards for SOA, EDA and Linked Data and especially open standards for service interfaces with focus on the semantics. See http://arkitekturguiden.digitaliser.dk/node/97	1	The National Agency for Digitisation is responsible for the selection of cross governmental standards. This is done as in integrated part of the national digitisation strategy. NemHandel is probably the biggest example.	Nemhandeli a major project that involves mandatory use of electronic invoicing to all public authorities. The whole architecture is technology neutral based on open standards such as UBL, XML, SAML.	2	A number of national infrastructure service such as ID (NemID), SSO (NemLogin), procurement (NemHandel) and portals (borger.dk & virk.dk) use open and technology neutral solutions in relation to integration. The use of common solutions such as these is closely monitored. Adaptability in the form of responsive design is also in focus now in order to support the use of mobile devices. http://arkitekturguiden.digitaliser.dk/node/640	1
Effectiveness and efficiency EIF, Chapter 2, Underlying principles Category: Principles	Does the NIF contain the 'Effectiveness and efficiency' principle?	The revised NIF will promote coherence, effectiveness and efficiency with a strong focus on cross organisational perspective. The existing NIF contains a similar principle: "Processes should be optimized when digitized". The overall target for the development of eGovernment is improving quality, service and efficiency as reflected in the cross governmental digitisation strategy.	2	About 40 projects have used the formal business case model as part of risk evaluation in the Danish Council for It-projects. However, these are not public.	A business case regarding "Relocation services for the elderly" has been published http://www.digst.dk/Digital-velfaerd/Strategi-for-digital-velfaerd/Rapporter-og-analyser/Social/Opdatering-af-business-case-om-forflytning-i-aeldreplejen.aspx This is not based on the Excel sheet of the Business Model, but uses principles from this such as scenarios.	2	It is mandatory for all state projects with a cost over 10 min DKR to have an approved business case using a common business case model. All state projects with a cost over 10 millions DKR are monitored by The Danish Council for It-projects. Reporting on profit realization is also mandatory. For other projects this is a recommendation. See http://www.itprojektraad.dk/English	2

EIF Element - Reference - Category	Measurement	NIF element present - Reference - (Text in English)	**NIF-EIF Alignment** NIF-EIF alignment scoring 2: fully 1: partially 0: not aligned	**NIF implementation** Large scale implementation *[describe if and how implementation of the element is a common practice]*	Only implementation **examples** *[describe an implementation example specific to each element]*	Implementa-tion scoring 2: Common practice 1: some examples 0: not observed	**NIF monitoring** NIF monitoring	Monitoring scoring 2: Monitored 1: Partially monitored 0: not observed
Conceptual model EIF, Chapter 3 Category: Conceptual model	Does the NIF contain a conceptual model?	The upcoming revised NIF is expected to include a conceptual model which will map quite well to the EIF model. For the record, the previous NIF contains a number of architecture artefacts along the lines of what is mentioned in the EIF. The common public reference models, Business Reference Model (FORM) and Service and Technology Reference Model (STORM) forms the foundation for cross-public cooperation and support coherence across the public sector's IT portfolio.	2	The common public reference models, Business Reference Model (FORM) forms the foundation for cross-public cooperation and support coherence across the public sector's IT portfolio. FORM is the common taxonomy for description of the public tasks. FORM is maintained by a joint public editorial consisting of experts from the Digitizing Agency. This agency publishes annually an updated version of FORM and supports projects in the application of the taxonomy, which can be freely used by public and private organizations. The national portals for citizens enterprises are large scale implementations very similar to the EIF conceptual model. They both use NemID and NemLogin for identity and rights management across services from all of government. The Grunddata initiative is currently developing a common infrastructure in order to develop a standardized interfaces to national base registries.	The national portal borger.dk is in practice based on a conceptual models similar to the EIF. It uses a common infrastructure for service integration and for identity and rights management. It also uses FORM as a taxonomy in the integration infrastructure.	2	FORM is used to describe projects and solutions e.g. in relation to monitoring by the Danish Council for It-projects. All state projects with a cost over 10 millions DKR are monitored by The Danish Council for It-projects. For other projects this is a recommendation. See http://www.itprojektraad.dk/English	2
Public administrations should develop a component-based service model, allowing the establishment of (European) public services by reusing, as much as possible, existing service components. EIF, Recommendation 9 Category: Conceptual model	Is the conceptual model a component-based service model? (e.g. SOA)	The present NIF contains a specific principle: "Base the solutions to loosely coupled components". Component based service model is at the core of the NIF. It describes a Service-Oriented Architecture and includes a set of principles for services as well as a number of profiles on international open standards. The reference models FORM and STORM are used to categorize solution components. E.g. the national infrastructure solution. See http://arkitekturguiden.digitaliser.dk/node/98	2	The NIF includes a set of principles for services. Reference: http://arkitekturguiden.digitaliser.dk/node/708 It also contains a number of integration patterns and profiles on international open standards. Reference: http://arkitekturguiden.digitaliser.dk/node/483 http://arkitekturguiden.digitaliser.dk/node/484 The references FORM and STORM are used to categorize solution components.	E.g. national infrastructure solutions. Reference: http://arkitekturguiden.digitaliser.dk/node/158	2	The Steering Committee for Data and Architecture has the responsibility for governance of the cross governmental interoperability architecture (NIF). This includes review of crossgovernmental projects conformance to the NIF which includes a component based service model.	2
Public administrations should agree on a common scheme to interconnect loosely coupled service components and put in place the necessary infrastructure when establishing (European) public services. EIF, Recommendation 10 Category: Conceptual model	Does the NIF encourage the use of common schemes to interconnect loosely coupled service components?	Since 2003 the NIF has encouraged the use of common XML schemas to interconnect loosely coupled service components. Today the approach to OTHER formats is more open, e.g. to the use of JASON which is considered more light weight and easier to use in some cases. Currently the focus is on more on semantics and common rules for data models in relation to exhibiting shared data. Current focus is also on sharing data models using RDF and common vocabularies. There exist also a number of integration patterns and national profiles on international standards. These are expected to be revised in the current strategy period. See http://arkitekturguiden.digitaliser.dk/node/108 NIF element text: Data exchange should use common data standards	2	Several generic frameworks have been developed to promote and support loose coupling of public services. Here are some examples: - OIOXML allows development of interoperable data formats and discovery and reuse of existing definitions - OIOREST is a national profile of REST to ensure easy establishment of RESTful services - OIOSAML is a national profile of the authentication/authorisation standard SAML to enable easy exchange of user rights - NemLogin is a single sign on component available to all - OIOIDWS is a framework for identity based web services	The single largest initiative on common schemes is probably NemHandel using the UBL variant OIOUBL for invoicing the public sector. Currently a number of new initiatives are focusing on future alignment to international and EU supported sematic standards in the form of ontologies and vocabularies (e.g. Organisation and Classification). DK is also strongly involved in eSENS (thus preparing for CEF Digital).	2	The Steering Committee for Data and Architecture has the responsibility for governance of the cross governmental interoperability architecture (NIF). This includes review of crossgovernmental projects and their use as common schemes.	2
Interconnection of service components. EIF, Recommendation 10 Category: Conceptual model	Does the NIF encourage to put in place the infrastructure to interconnect loosely coupled service components?	The NIF has done this since the White Paper on It-architecture from 2003, which recommends Service-Oriented Infrastructure. It is also part of the general principles and best practice recommendations. See http://arkitekturguiden.digitaliser.dk/node/98 NIF element text: Base the solutions to loosely coupled components	2	Loosely coupled service components is widely implemented in the public sector today. Probably the most widespread implementation is the municipalities where the common unique architecture is based on service oriented standards developed as part of the NIF implementation.	The Basic Data programme has implemented as data distribution component called the Datafordler which implements a loos coupling of the Basic Data registries and provides external services to both public and private sector. It provides a number of different service interfaces.	2	The Steering Committee for Data and Architecture has the responsibility for governance of the cross governmental interoperability architecture (NIF). This includes review of cross governmental projects and their solutions architecture. The ability to exhibit services is a central part of this.	2
Public administrations should make their authentic sources of information available to others while implementing access and control mechanisms to ensure security and privacy in accordance with the relevant legislation. EIF, Recommendation 11 Category: Conceptual model	Does the NIF encourage to make the authentic sources of information available to others?	The principle is central in the NIF (both existing and revision draft) Existing NIF element text: Good Basic Data for Everyone – A Driver for Growth and Efficiency Draft revised NIF element text: Data are shared and reused	2	A large number of initiatives in the current cross governmental digitization strategy will result in the exhibition of public data. The strategy includes setting up a common framework for exhibition in data catalogues (excepted DCAT) and common rules for data models. This is all closely coordinated among state agencies and with the regions and municipalities.	The Basic Data initiative is a major new initiative with the purpose of sharing high value and well structured basic data. Basic data is the core information authorities use in their day-to-day case processing. Basic data is e.g. data on individuals, businesses, addresses, real properties and geography (i.e. digital maps). The Basic Data programme has implemented as data distribution component called the Datafordeler which implements a loos coupling of the Basic Data registries and provides external services to both public and private sector. It provides a number of different serviceinterfaces.The architecture builds on a security model using the national NemLogin infrastructure for identity and rights management.	2	The Steering Committee for Data and Architecture has the responsibility for governance of the cross governmental interoperability architecture (NIF). This includes review of cross governmental projects and their solutions architecture. The requirement to share and exhibit data is a central part of this.	2

Analysis of the NIFs

EIF Element - Reference - Category	Measurement	**NIF element present** - Reference - (Text in English)	**NIF-EIF alignment scoring** 2: fully 1: partially 0: not aligned	**Large scale implementation** [describe if and how implementation of the element is a common practice]	Only implementation **examples** [describe an implementation example specific to each element]	**Implementa-tion scoring** 2: Common practice 1: some examples 0: not observed	**NIF monitoring**	**Monitoring scoring** 2: Monitored 1: Partially monitored 0: not observed
NIF-EIF Alignment				**NIF implementation**			**NIF monitoring**	
Access control EIF, Recommendation 11 Category: Conceptual model	Does the NIF encourage access and control mechanisms to ensure compliance to security and privacy legislation?	The NIF mentions as a principle "Use digital signatures and single-sign-on". Most specifically via common infrastructure solutions for ID and SSO. Also via requirements and recommendations in regards till compliance to ISO 27001. See http://arkitekturguiden.digitaliser.dk/principper/best-practice/brug-digital-signatur-og-single-sign	2	The NemID and NemLogin infrastructure solutions are widely in use in the public sector and mandatory for solution integrated in the national portals such as borger.dk and virk.dk. See: http://www.digst.dk/Servicemenu/English/Digitisation/Digital-Signature http://www.digst.dk/Servicemenu/English/Digitisation/NemLogin	The NemID and NemLogin infrastructure solutions are widely in use in the public sector and mandatory for solutions integrated in the national portals such as borger.dk and virk.dk.	2	Monitoring through the national infrastructure solutions. NemLogin (and NemID) are implemented in the portals borger.dk and virk.dk and are thus de facto mandatory and implemented in all the self service solutions from all Danish public authorities. More than 300 it-systems use NemLogin. For systems not included in the portals the National Audit Agency or the Danish Council for it-Projects may monitor the reuse of the national solutions.	2
Public administrations, when working to establish (European) public services, should develop interfaces to authentic sources and align them at semantic and technical level. EIF, Recommendation 12 Category: Conceptual model	Does the NIF encourage the development of interfaces to authentic sources that are aligned at semantic and technical level?	The NIF mentions as principle: "Data exchange should use common data standards". This is a core recommendation since the the initiation of the OIOXML initiative and Whitepaper on It-architecture from 2003. The recent basic-data initiative aims to define, align and make available core authentic sources. See http://arkitekturguiden.digitaliser.dk/node/108	2	Many of the central authentic sources such as The Central Person Registry (www.cpr.dk) and The Central Business Registry (www.cvr.dk) are open and aligned by law and design. This is considered core business requirements for registries. Law defining the CPR: https://www.retsinformation.dk/Forms/R0710.aspx?id=125606 Law defining the CVR: https://www.retsinformation.dk/Forms/R0710.aspx?id=27293 http://www.digst.dk/Home/Servicemenu/English/Digitisation/Basic%20Data	The Basic data programme has aligned the major Danish basic registries. They provide through a common infrastructure services with aligned interfaces both on a technical and semantic level. These services are to be used and integrated in public services included in both the citizen and enterprise portals borger.dk and virk.dk.	2	The Steering Committee for Data and Architecture has the responsibility for governance of the cross governmental interoperability architecture (NIF). This includes use of common rules regarding semantic and technical specifications. The Basic Data initiative is a major initiative with a strong focus on governance and monitoring is part of the programme. The basic data committee ensures the coordination of large development initiatives, ensures that interfaces and data models are coordinated and ensures that public authorities are exploiting the potential of efficient use of basic data. See http://uk.fm.dk/publications/2012/good-basic-data-for-everyone/~/media/Publikationer/Imported/2012/Gode%20grunddata%20til%20alle/Basic Data_UK_web_2012.10.08.ashx	2
Interoperability levels EIF, Chapter 4 Category: Interoperability levels	Does the NIF describe the four levels of interoperability?	The Danish NIF is currently under revision as part of the new cross governmental strategy for digitisation. It expected to be published in a final version by summer 2017. It includes the four EIF levels, and is expected to map quite well to the revised EIF. The draft focus on eight aspects / levels, namely Governance, Strategy, Legal, Security, Business, Information, Application and Technology/Infrastructure.	1	The architecture checklist focuses on the use of common methods, standards and solutions. It ranges from strategy, rules and governance framework over processes, organization and information to applications, technology and security. Reference: http://arkitekturguiden.digitaliser.dk/node/211	The architecture is being revised as part of the new governance regime and has been used to review e.g. the architecture of the Next Generation Digital Post project.	2	The monitoring according to the new (draft) model is already implemented in the form of review of initiatives that are part of the cross governmental strategy. There will also be governance for maintenance and further development/application of interoperability levels.	1

		NIF-EIF Alignment			NIF implementation			NIF monitoring	
EIF Element - Reference - Category	Measurement	**NIF element present** - Reference - (Text in English)	**NIF-EIF alignment scoring** 2: fully 1: partially 0: not aligned		**Large scale implementation** *[describe if and how implementation of the element is a common practice]*	Only implementation **examples** *[describe an implementation example specific to each element]*	**Implementa-tion scoring** 2: Common practice 1: some examples 0: not observed	**NIF monitoring**	**Monitoring scoring** 2: Monitored 1: Partially monitored 0: not observed
Legal interoperability: Public administrations should carefully consider all relevant legislation relating to data exchange, including data protection legislation, when seeking to establish a European public service. EIF, Chapter 4 Recommendation 14 Category: Interoperability levels, legal artefacts	Does the NIF impose to consider all relevant legislation related to data exchange?	Denmark has a set of principles regarding legal level including evaluation of a project in relation to relevant laws. Denmark has a major initiative to make relevant laws ready for digitisation including a set of guidelines.. NIF element text: Laws must be aligned to the digital age	2		The Danish strategy to make the law more ready for digitisation is basically about three things: - First, to adapt legislation to best support the digitisation of the public sector. - Second to think the possibilities of digitisation from the start when creating new legislation in a field. - Thirdly, the acquisition of new IT solutions must be as simple and flexible as possible within the existing EU rules. Personal Data Act sets out a series of rules for the processing of personal information so that citizens and companies are assured that sensitive personal information released to the public administration is treated correctly and with the appropriate confidentiality.	*A set of guidelines on how to make laws that are ready for digitization. See: http://www.digst.dk/Servicemenu/Nyheder/Nyhedsarkiv/ Digitaliseringsstrategien/Ny-offentliggorelse-af-vejledning-om-digitaliseringsklar-lovgivning.aspx*	2	The Act on Processing of Personal Data is under the authority of the Danish Data Protection Agency; therefore, it is the agency's duty to ensure that the law is abided by. This duty is performed in part by providing guidance to and advising authorities, companies and citizens. Through notifications and authorisations the Danish Data Protection Agency can control some of the more sensitive processing of personal data that is performed by authorities and companies. In case of citizen complaints, the Danish Data Protection Agency can make decisions on whether certain processing is in accordance with the regulations of the Act on Processing of Personal Data. The Danish Data Protection Agency can also take up cases of its own initiative – own-initiative cases – if, e.g. due to a citizen enquiry or newspaper article, the agency suspects a violation of the regulations of the Act on Processing of Personal Data. The Danish Data Protection Agency issues criticism in its decisions if the controller has violated the regulations of the Act on Processing of Personal Data. The Danish Data Protection Agency conducts an annual series of inspections of public authorities and private companies that have received the agency's authorisation to process personal data. The Danish Data Protection Agency inspects whether the processing of data is carried out in accordance with the Act on Processing of Personal Data.	2
Organisational interoperability - business process alignment. Public administrations should document their business processes and agree on how these processes will interact to deliver a (European) public service. EIF, Chapter 4 Recommendation 15 Category: Interoperability levels, organisational artefacts	Does the NIF describe that the business processes are documented in an agreed way in order for other administrations to understand the overall business process?	The draft for the revised NIF focus on cross-organisational processes: Revision draft principle "Processes are supported digitally". When authorities share processes e.g. in relation to a customer journey that cut across organizational and professional boundaries documentation on processes, work flow and business logic should be defined in collaboration, including the customer, be shared and when relevant comply with the standard BPMN.	2		The new strategy includes initiatives on various areas. E.g. user journeys in relation to self services, collaboration regarding patients with complex processes in the health and care domains and efficient control regarding public benefits.	A pilot project on user journeys in the health sector is developing an architecture and solution to share information on targets and appointments in relation to the patient. Data are to be shared among relevant professional actors as well as the patient and relevant relatives.	2	The Steering Committee for Data and Architecture has the responsibility for governance of the cross governmental interoperability architecture (NIF).	2
Inter-governmental coordination. EIF, Chapter 4 Recommendation 15 Category: Interoperability levels, organisational artefacts	Does the NIF encourage to agree on how these processes will interact among the different levels of public administrations?	Draft revised principle: Architecture is governed on the right level and after common methods. The NIF is and has always since 2003 been a 100% joint effort with all levels of government involved both in governance and practical work. Today it is part of the national cross governmental digitisation strategy. This places great demands on a strong decentralized implementation capacity, but also a centrally focused coordination effort. Old principle: Share knowledge and collaborate	2		As part of the joint public digital strategy there is renewed and strong focus on collaboration and coordination regarding interoperability architecture, standards and solutions. There are a number of initiatives that are coordinated at a national level. Largest programme is the Grunddata initiative and a number of initiatives which are part of the digital welfare strategy. E.g. regarding security and user management and a portal related to schools and kindergarten. As part of the joint public digital strategy there is an initiative focusing on more cohesive user pathways across authorities.	The Steering Committee for Data and Architecture has the responsibility for governance of the cross governmental interoperability architecture (NIF). This committees work is being coordinated with similar work in e.g. the regions and the municipalities.	1	The Steering Committee for Data and Architecture has the responsibility for governance of the cross governmental interoperability architecture (NIF). This includes overseeing the coordination across relevant domains included in the cross governmental digitization strategy.	2
Organisational interoperability - organisational relationships. Public administrations should clarify their organisational relationships as part of the establishment of a (European) public service. EIF, Chapter 4 Recommendation 16 Category: Interoperability levels, organisational artefacts.	Does the NIF encourage public administrations to clarify their organisational relationships as part of the establishment of a (European) public service?	The organisational aspect is an explicit part of the Danish framework and much in focus in the current strategy, e.g. in initiatives regarding coherent "user travels" (UX across various related self service tasks) and complex patient processes. A new register of public authorities is also an example of a common tolls to support mere clear understanding of the organisational aspect. Other examples are the planned development of standard contracts related to sharing data and a common set of principles for both data description and web services ices.	2			This is done through concrete collaboration projects. The national guidelines for public self service services underscores, that projects should integrate the relevant functionality and data across the public sector. Reference: http://arkitekturguiden.digitaliser.dk/godselvbetjening/kr avbanken/Data-og-funktionalitet# The 2016-2020 strategy includes a initiative regarding "good user travels", a reference architecture for self service solutions and common guidelines for self services solutions.	1	The Steering Committee for the cross governmental digitisation strategy has the responsibility for governance of the cross governmental collaboration initiatives which are part of the strategy.	2

EIF Element - Reference - Category	Measurement	NIF element present - Reference - (Text in English)	NIF-EIF alignment scoring 2: fully 1: partially 0: not aligned	Large scale implementation [describe if and how implementation of the element is a common practice]	Only implementation examples [describe an implementation example specific to each element]	Implementation scoring 2: Common practice 1: some examples 0: not observed	NIF monitoring	Monitoring scoring 2: Monitored 1: Partially monitored 0: not observed
		NIF-EIF Alignment		**NIF implementation**			**NIF monitoring**	
Organisational interoperability - change management. Public administrations working together to provide (European) public services should agree on change management processes to ensure continuous service delivery. EIF, Chapter 4 Recommendation 17 Category: Interoperability levels, organisational artefacts	Does the NIF encourage public administrations to agree on change management processes to ensure continuous service delivery?	The new strategy has much focus on change management, both with respect to architecture, service management and robust infrastructure. Denmark has defined a set of service principles as part of the NIF. One principle relates to change management. Existing NIF element text: Services that change must be versioned, so they burden service users minimally.	2			1	The Steering Committee for Data and Architecture has the responsibility for governance of the cross governmental interoperability architecture (NIF). This is expected to include principles for change management regarding architecture. A new cross governmental steering committee is responsible for operations management of the cross governmental infrastructure solutions. The Basic Data Programme has a governance set-up responsible for design authority and monitoring. The basic data committee ensures that interfaces and data models are coordinated.	2
Semantic interoperability. Public administrations, when working together to establish (European) public services, should use a common taxonomy of basic public services. EIF, Chapter 4 Recommendation 13 Category: Interoperability levels, semantic artefacts.	Does the NIF encourage the usage of a common taxonomy of basic public service?	The NIF mentions as principle: "Use common business terminology". The reference model FORM is a taxonomy that contains more than 1800 public services. See http://arkitekturguiden.digitaliser.dk/node/105	2		FORM is used in the citizen portal borger.dk as well as in a number of other solutions. FORM is mapped to a similar taxonomy used in the municipalities. FORM and perhaps other taxonomies are expected to be used as part of the cross governmental architecture. This includes e.g. portals such as borger.dk and digital post.	1	The Steering Committee for Data and Architecture has the responsibility for governance of the cross governmental interoperability architecture (NIF). This is expected to include the use of common taxonomies.	2
Public administrations should support the establishment of sector specific and cross-sectoral communities that aim to facilitate semantic interoperability and should encourage the communities to share results on national and European platforms. EIF, Recommendation 18 Category: Interoperability levels, semantic artefacts	Does the NIF encourage public administrations to support the establishment of sector specific and cross-sectoral communities that aim to facilitate semantic interoperability and that share results on national and European platforms?	There are a number of recommendations and guidelines regarding this as well as a number of practical initiatives in the past 10 years as well as current initiatives. See http://arkitekturguiden.digitaliser.dk/principper/domaeneprincipper	1		The focus today is related to well defined initiatives in the national digitisation strategy (e.g. the Basic data initiative) and the national strategy for digital welfare (e.g. an initiative regarding a collaboration portal related to children (school and kindergarten). The NIF encourages setting up communities and sharing of result via digitaliser.dk, which again shares some of the most interesting result via Joinup. National Health IT in collaboration with regional and other partners in health produced a set principles to work on common IT architecture and standards for health IT. See http://sundhedsdatastyrelsen.dk/da/rammer-og-retningslinjer/om-referencearkitektur-og-standarder	1	The Steering Committee for the cross governmental digitisation strategy has the responsibility for the cross governmental collaboration initiatives which are part of the strategy.	2
Technical interoperability. Public administrations should agree on the formalised specifications to ensure technical interoperability when establishing European public services. EIF, Recommendation 19 Category: Interoperability levels, technical artefacts.	Does the NIF encourage public administrations to agree on the formalised specification to ensure technical interoperability when establishing European public services.	The digitizing Agency defines technical standards, data standards and standards for a Service-Oriented infrastructure. Standards are mandatory unless a proper reason has been documented. See http://arkitekturguiden.digitaliser.dk/node/108 See http://www.digst.dk/Arkitektur-og-standarder/Standardisering See http://www.digst.dk/Servicemenu/English/IT-Architecture-and-Standards/Open-standards NIF element text: Data exchange should use common data standards	2		Danish authorities share a number of profiles on technical standards for web services, e.g. RASP and SAML called OIO RASP and OIOSAML. See: http://arkitekturguiden.digitaliser.dk/tekniske-standarder-services A number of recent activities focus on aligning national standards to international standards supported by the EU.	1	The Steering Committee for Data and Architecture has the responsibility for governance of the cross governmental interoperability architecture (NIF). This is expected to include integrations patterns and technical standards for secure transport.	2
Public administrations, when establishing (European) public services, should base interoperability agreements on existing formalised specifications, or, if they do not exist, cooperate with communities working in the same areas. EIF, Recommendation 20 Category: Interoperability agreements.	Does the NIF encourage: - Interoperability agreements to be based on existing formalised specifications? Or - if they do not exist, to cooperate with communities working in the same areas.	The general recommendation is preference to international standards when such exist and cover business needs. The architectural framework includes a number of recommendations and requirements relating to standards that are part of the OIO architecture. See http://arkitekturguiden.digitaliser.dk/principper/hvidbogens-ledetraade-og-principper-arkitekturarbejdet NIF element text: The architecture programme should be coordinated with similar work at international level and Denmark should be proactive in international standardisation work.	2	The interoperability agreements have for the past 10 years been based on an Inter-government cooperation (OIO). OIO is a common public framework for public administrations to work together to create coherent public service delivery based on common architecture and standards. See http://www.digst.dk/Servicemenu/English/IT-Architecture-and-Standards/OIO-architecture-framework This has been general practice in context of a number of initiatives including NemHandel which has defines a national standard OIOUBL based on international standard UBL. DK has been closely involved in the international work. Another example is OIODSAML based on SAML 2.0 Reference to info on international standards: http://www.digst.dk/Arkitektur-og-standarder/Standardisering/Internationalt-samarbejde	*Denmark has for many years been deeply involved in the work with Open Group regarding UBL and via eSENS with other communities regarding e-invoicing and procurement as part of the national NemHandel initiative.*	2	The Steering Committee for Data and Architecture has the responsibility for governance of the cross governmental interoperability architecture (NIF). This is expected to include the adoption of existing, especially international specifications as cooperation with relevant communities..	2

Analysis of the NIFs

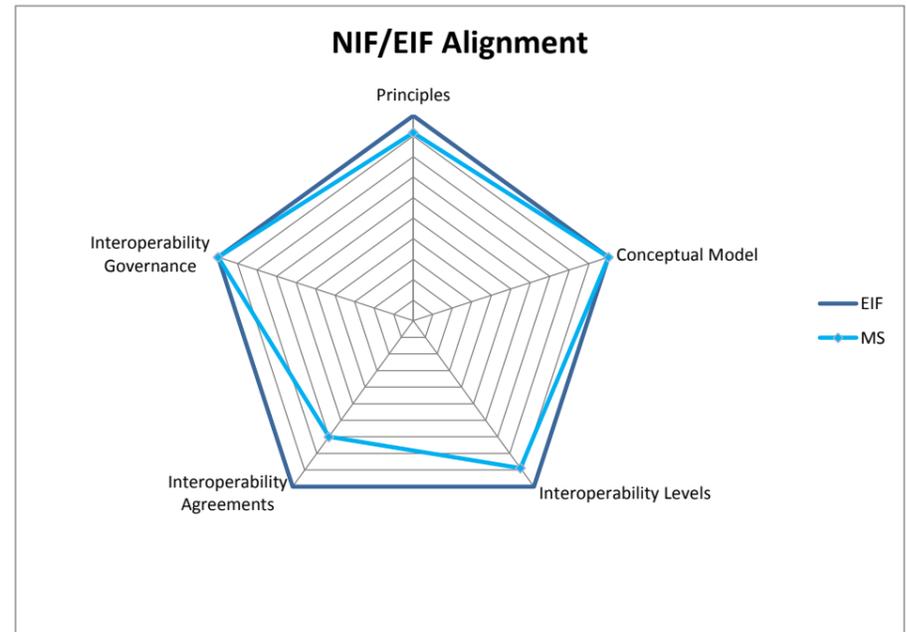| EIF Element - Reference - Category	Measurement	NIF element present - Reference - (Text in English)	NIF-EIF alignment scoring 2: fully 1: partially 0: not aligned	Large scale implementation [describe if and how implementation of the element is a common practice]	Only implementation examples [describe an implementation example specific to each element]	Implementation scoring 2: Common practice 1: some examples 0: not observed	NIF monitoring	Monitoring scoring 2: Monitored 1: Partially monitored 0: not observed
		NIF-EIF Alignment		**NIF implementation**			**NIF monitoring**	
Public administrations should use a structured, transparent and objective approach to assessing and selecting formalised specifications. EIF, Recommendation 21 Category: Interoperability agreements.	Does the NIF encourage Public administrations to use a structured, transparent and objective approach to assess and select formalised specifications?	This has been a major focus in several years, but is not currently a specific initiative, but more seen as a normal "good practise". The OIO arkitekturguide refers to CAMSS. CAMSS may be used as part of a assessment, maybe in a profiled manner. NIF element text: The EU has developed a framework for the assessment of standards called CAMSS - Common Assessment Method for Standards and Specifications. This can be used nationally, in a domain or local when it comes to værlge standards. http://arkitekturguiden.digitaliser.dk/node/640	1	This has been a major focus in several years, but is no longer a specific initiative, but more seen as a normal "good practice". The Danish Agency for Digitisation coordinates the public initiatives on standardization and IT architecture. In the period from 2003 to 2011 there existed a framework including a governance set-up with participation from the state, regions and municipalities. A generic, transparent and open process for selection of specifications was implemented including public hearing. This type of activity has more or less been dormant since October 2011, but since December 2013 it has been revoked in a very downscaled version. Recently we have applied the CAMSS framework in relation to evaluating a number of standards.	CAMMS was used in a cross governmental analysis looking into specification for secure identity based web services covering both the health sector and broad public infrastructure.	2	The Steering Committee for Data and Architecture has the responsibility for governance of the cross governmental interoperability architecture (NIF). This is expected to include the processes regarding evaluation of specifications e.g. by the use of CAMSS.	2
When establishing (European) public services, public administrations should prefer open specifications, taking due account of the coverage of functional needs, maturity and market support. EIF, Recommendation 22 Category: Interoperability agreements.	Does the NIF encourage public administrations to prefer open specifications, taking due account of the coverage of functional needs, maturity and market support?	There are formal decisions. Parliament decision B103 regarding the (mandatory) use of open standard states that public sector procurement of information technology should be based on the administration's assessment of its operation and how service are most effective, properly and economically. Government IT policy should ensure the public sector the best software at the lowest possible prices. This includes parameters such as functionality, stability and security. Government IT policy should contribute to ensuring a competitive market for software in Denmark. See http://www.digst.dk/Servicemenu/English/IT-Architecture-and-Standards/Open-standards NIF element text: Make demands on open standards http://arkitekturguiden.digitaliser.dk/node/115	2	Under parliamentary resolution B103 (session 2005/06) the government must ensure that public use of information technology, including use of software is based on open standards. The requirement for use of open standards applies to procurement of new software and major updates and should be cost-neutral as described in the existing criteria for the public sector. The resolution is implemented by an agreement between the government, the regions and the municipalities. There is a list of seven sets of mandatory standards with a focus on interoperability, accessibility and security. Government IT policy should ensure the public sector the best software at the lowest possible prices. This includes parameters such as functionality, stability and security. Government IT policy should contribute to ensuring a competitive market for software in Denmark. In 2004, the Danish National IT and Telecom Agency introduced a Definition of Open Standards which provides the relevant parameters to evaluate the openness of technical standards. In 2007 there was a national agreement which made the use of open standards mandatory in the public sector to make sure that IT systems can communicate with each other, but also to increase competition between suppliers of these systems. All public authorities must use seven sets of open standards in all new IT solutions. The basic principle is 'comply or explain', meaning that any authority that purchases a new system that does not comply with a relevant standard must publish an explanation of the reason for the non-compliance. For exchanging documents between public authorities, the ministry proposes the use of either ISO standard Open Document Format (ODF) or Microsoft's standard, Office OpenXML. It was also made mandatory for public	[describe project here]	2	The Steering Committee for Data and Architecture has the responsibility for governance of the cross governmental interoperability architecture (NIF). This is expected to include the use of open specifications.	2
Contribution to the standardisation process Public administrations should lead or actively participate in standardisation work relevant to their needs. EIF, Chapter 5, Recommendation 23 Category: Interoperability agreements.	Does the NIF encourage public administrations to lead or actively participate in standardisation work relevant to their needs?	The work on architecture must be coordinated with similar work at the international level, and Denmark should act proactively to international standardization. See http://arkitekturguiden.digitaliser.dk/principper/hvidbogens-ledetraade-og-principper-arkitekturarbejdet	1	[describe here]	Denmark is participating in a number of initiatives such as UBL, PEPPOL, eSENS. E-ARK.	1	Not on a general level, but via the governance set-up managing the strategies and individual initiatives.	1
Public administrations, when working together to establish (European) public services, should agree on minimum service requirements for secure data exchange. EIF, Recommendation 13 Category: Interoperability agreements.	Does the NIF encourage public administrations to agree on minimum service requirements for secure data exchange?	On a general level and facilitated by a common infrastructure. It is generally assumed that service requirements are clarified in the course of any collaboration so minimum service requirements are not handled expressly in the NIF. Government authorities must and all other public authorities should follow the open standard for information security, IS 2700 family, so that all aspects of safety are carefully considered on the basis of a risk. See http://arkitekturguiden.digitaliser.dk/princip/informationssikkerhed-fra-start-til-slut NIF element text: Information Security from start to finish	1	The principle defines, that there should be a uniformly high level of information security across the public sector, so that information in a secure manner may be stored, processed and exchanged between institutions, citizens and businesses. There is a close cooperation between the National Agency for Digitisation, the National eHealth Authority, the regions and the municipalities in order to secure the implementation, including establishing as national infrastructure for secure services with common standards and infrastructure services.	The national NemHandel (eInvoicing) infrastructure is based on open standards such as UBL and RASP.	2	Not on a general level, but via the governance set-up managing the strategies and individual initiatives.	1

Analysis of the NIFs

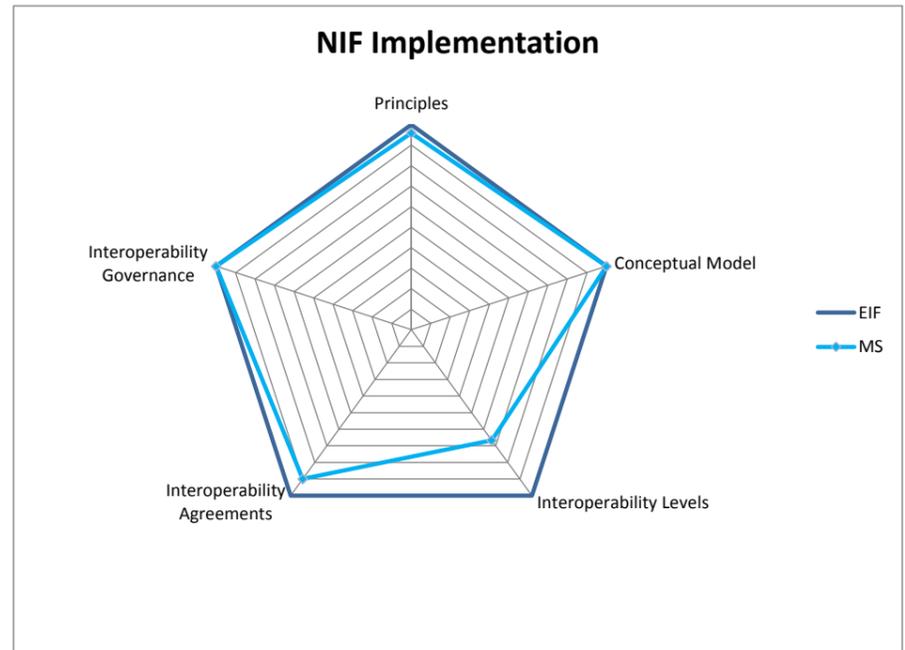|		NIF-EIF Alignment		NIF implementation			NIF monitoring	
EIF Element - Reference - Category	Measurement	**NIF element present** - Reference - (Text in English)	**NIF-EIF alignment scoring** 2: fully 1: partially 0: not aligned	**Large scale implementation** [describe if and how implementation of the element is a common practice]	Only implementation **examples** [describe an implementation example specific to each element]	**Implementa-tion scoring** 2: Common practice 1: some examples 0: not observed	**NIF monitoring**	**Monitoring scoring** 2: Monitored 1: Partially monitored 0: not observed
Governance Public administrations should establish a framework for the governance of their interoperability activities across administrative levels. EIF, Recommendation 25 Category: Interoperability Governance	A governance framework exists to control the interoperability activities across administrative levels.	It is a specific initiative in the common public sector e-government strategy. Roles and responsibilities at national level The Ministry of Finance is the main initiator of strategies and policies related to eGovernment and interoperability in Denmark. The Ministry of Finance develops initiatives concerning administration, public leadership and digitisation to improve the efficiency of the public administration in general. The Agency for Digitisation (merger of National IT and Telecom Agency and the Agency of Government Management) functions as a catalyst regarding the strategy shaped by the Ministry of Finance. The Agency's main responsibility is to contribute to the accomplishment of the political vision, the strategy and the understanding and development of relevant technology. Moreover the agency coordinates the work and acts as the secretariat for the Steering Committee for joint Government cooperation. The Ministry of Business and Growth develops, and is responsible for the IT strategy for the private sector in Denmark. The Ministry of Economic Affairs and the Interior performs certain tasks regarding IT modernization and digitisation-related issues., The steering committee (or STS) consists of top representatives from central ministries and from the municipalities and regions. The committee performs preparatory work for major political decisions, including the yearly economic negotiations between central and local government and the digital strategy107. Roles and responsibilities at regional and local level The Danish public sector is characterized by a high level of decentralization; however, state, regions and municipalities collaborate closely. As mentioned above, the steering committee forms an important role connecting central and local government. The sub-national governments are closely connected to the central one through legislation. However, the legislations and ICT solutions shall leave space for local adaptation. Major ICT solutions will consist of large e-government —building blocks, where each building block represents a delimited part of the digital procedure. The ICT building blocks offer the municipalities huge advantages. It becomes easier and cheaper to change the municipal services and switch suppliers. http://www.digst.dk/Servicemenu/English/Policy-and-Strategy/Digital-Strategy-2016to2020 NIF element text: Stronger coordination and implementation	2	The cross governmental digitisation strategy 2010-2015 sets clear and binding goals for eGovernment by 2015. Achieving the objectives is less about developing major new IT solutions and more about ensuring more consistent implementation of the eGovernment solutions established in recent years. Stronger coordination ensures that the various sections of the public sector work together seamlessly. All progress made in the eGovernment strategy initiatives and their benefits are clarified and documented according to a common description model. The benefits predicted for eGovernment projects are realized in practice through a set of formalized KPIs according to a formal Business Case model. The governance organisation includes political agreement between national government, municipalities and regions (every five years a new strategy is agreed upon). A steering committee is responsible for the overall governance of the strategy. The steering committee consists of high-level officials of key ministries, a representative of Local Government Denmark, and a representative of Danish Regions. A number of steering committees related to specific initiatives and specialist groups and working groups are responsible for more detailed governance, all reporting to the steering committee. Large scale projects are monitored by the Danish Council for IT Projects according to the cross-governmental programme and IT project models. The Danish Agency for Digitisation, under the Ministry of Finance, is the responsible authority and provides the main secretariat functions.	As an example could be mentioned the governance of mandatory self service and mandatory use of digital post. In 2015, a total of 80 pct. of Danish citizens' communication with public authorities will be digitally based. Citizens will be required to use digital self-service for a wide range of services, and to receive digitally letters, notices and messages from public authorities. Both of these two major initiatives are anchored in legislation and progress and conformance of both the implementation and actual use is closely governed with milestones and deadlines and monitoring with public KPIs. For the implementation of mandatory self service solutions across government the concept of wave plans has been used (with four waves realised by 2015) combined with a common set of guidelines for self service solution to be implemented an accessible via the national portals for citizens and enterprises and with the use of common infrastructure for identification and rights management with single sign on.	2	The Steering Committee for Data and Architecture has the responsibility for governance of the cross governmental interoperability architecture (NIF). This includes review of crossgovernmental projects and relevant coordination of review processes across the governmental governance tiers. More specialized monitoring of compliance is also done with focus on selected aspects and within selected areas, typically related to specific initiatives such as mandatory self service or mandatory digital post, where monitoring focuses on meeting deadlines for implementation of common requirements, recommendations and solutions.	2

Directorate-General for Informatics (DIGIT)

Category	EIF	MS
Principles	100%	91,7%
Conceptual Model	100%	100,0%
Interoperability Levels	100%	88,9%
Interoperability Agreements	100%	70,0%
Interoperability Governance	100%	100,0%

NIF/EIF Alignment

Category	EIF Element	Max	MS
Principles	Subsidiarity and proportionality	2	2
	User-centricity	2	2
	Inclusion and accessibility	2	2
	Security and privacy	2	2
	Multilingualism	2	1
	Administrative simplification	2	2
	Transparency	2	2
	Preservation of information	2	2
	Openness	2	2
	Reusability	2	2
	Technological neutrality and adaptability	2	1
	Effectiveness and efficiency	2	2
	Total	**24**	**22**
Conceptual Model	Does the NIF contain a conceptual model?	2	2
	Is the conceptual model a component-based service model? (e.g. SOA)	2	2
	Does the NIF encourage the use of common schemes to interconnect loosely coupled service components.	2	2
	Does the NIF encourage to put in place the infrastructure to interconnect loosely coupled service components?	2	2
	Does the NIF encourage to make the authentic sources of information available to others?	2	2
	Does the NIF encourage access and control mechanisms to ensure compliance to security and privacy legislation?	2	2
	Does the NIF encourage the development of interfaces to authentic sources that are aligned at semantic and technical level?	2	2
	Total	**14**	**14**
Interoperability Levels	Does the NIF describe the four levels of interoperability?	2	1
	Does the NIF impose to consider all relevant legislation related to data exchange?	2	2
	Does the NIF describe that the business processes are documented in an agreed way in order for other administrations to understand the overall business process?	2	2
	Does the NIF encourage to agree on how these processes will interact among the different levels of public administrations?	2	2
	Does the NIF encourage public administrations to clarify their organisational relationships as part of the establishment of a (European) public service?	2	2
	Does the NIF encourage public administrations to agree on change management processes to ensure continuous service delivery.	2	2
	Does the NIF encourage the usage of a common taxonomy of basic public service?	2	2
	Does the NIF encourage public administrations to support the establishment of sectorspecific and cross-sectoral communities that aim to facilitate semantic interoperability and that share results on national and European platforms.	2	1
	Does the NIF encourage public administrations to agree on the formalised specification to ensure technical interoperability when establishing European public services.	2	2
	Total	**18**	**16**
Interoperability Agreements	Does the NIF encourage: - Interoperability agreements to be based on existing formalised specifications? Or - if they do not exist, to cooperate with communities working in the same areas.	2	2
	Does the NIF encourage Public administrations to use a structured, transparent and objective approach to assess and select formalised specifications?	2	1
	Does the NIF encourage public administrations to prefer open specifications, taking due account of the coverage of functional needs, maturity and market support?	2	2
	Does the NIF encourages public administrations to lead or actively participate in standardisation work relevant to their needs?	2	1
	Does the NIF encourage public administrations to agree on minimum service requirements for secure data exchange?	2	1
	Total	**10**	**7**
Interoperability Governance	A governance framework exists to control the interoperability activities across administrative levels.	2	2
	Total	**2**	**2**

Category	EIF	MS
Principles	100%	95,8%
Conceptual Model	100%	100,0%
Interoperability Levels	100%	66,7%
Interoperability Agreements	100%	90,0%
Interoperability Governance	100%	100,0%

Category	EIF Element	Scoring	
		Max	MS
Principles	Subsidiarity and proportionality	2	2
	User-centricity	2	2
	Inclusion and accessibility	2	2
	Security and privacy	2	2
	Multilingualism	2	1
	Administrative simplification	2	2
	Transparency	2	2
	Preservation of information	2	2
	Openness	2	2
	Reusability	2	2
	Technological neutrality and adaptability	2	2
	Effectiveness and efficiency	2	2
	Total	**24**	**23**
Conceptual Model	Does the NIF contain a conceptual model?	2	2
	Is the conceptual model a component-based service model? (e.g. SOA)	2	2
	Does the NIF encourage the use of common schemes to interconnect loosely coupled service components.	2	2
	Does the NIF encourage to put in place the infrastructure to interconnect loosely coupled service components?	2	2
	Does the NIF encourage to make the authentic sources of information available to others?	2	2
	Does the NIF encourage access and control mechanisms to ensure compliance to security and privacy legislation?	2	2
	Does the NIF encourage the development of interfaces to authentic sources that are aligned at semantic and technical level?	2	2
	Total	**14**	**14**
Interoperability Levels	Does the NIF describe the four levels of interoperability?	2	2
	Does the NIF impose to consider all relevant legislation related to data exchange?	2	2
	Does the NIF describe that the business processes are documented in an agreed way in order for other administrations to understand the overall business process?	2	2
	Does the NIF encourage to agree on how these processes will interact among the different levels of public administrations?	2	1
	Does the NIF encourage public administrations to clarify their organisational relationships as part of the establishment of a (European) public service?	2	1
	Does the NIF encourage public administrations to agree on change management processes to ensure continuous service delivery.	2	1
	Does the NIF encourage the usage of a common taxonomy of basic public service?	2	1
	Does the NIF encourage public administrations to support the establishment of sectorspecific and cross-sectoral communities that aim to facilitate semantic interoperability and that share results on national and European platforms.	2	1
	Does the NIF encourage public administrations to agree on the formalised specification to ensure technical interoperability when establishing European public services.	2	1
	Total	**18**	**12**
Interoperability Agreements	Does the NIF encourage: - Interoperability agreements to be based on existing formalised specifications? Or - if they do not exist, to cooperate with communities working in the same areas.	2	2
	Does the NIF encourage Public administrations to use a structured, transparent and objective approach to assess and select formalised specifications?	2	2
	Does the NIF encourage public administrations to prefer open specifications, taking due account of the coverage of functional needs, maturity and market support?	2	2
	Does the NIF encourages public administrations to lead or actively participate in standardisation work relevant to their needs?	2	1
	Does the NIF encourage public administrations to agree on minimum service requirements for secure data exchange?	2	2
	Total	**10**	**9**
Interoperability Governance	A governance framework exists to control the interoperability activities across administrative levels.	2	2
	Total	**2**	**2**

NIF Implementation

Category	EIF	MS
Principles	100%	79,2%
Conceptual Model	100%	100,0%
Interoperability Levels	100%	94,4%
Interoperability Agreements	100%	80,0%
Interoperability Governance	100%	100,0%

Category	EIF Element	Scoring	
		Max	MS
Principles	Subsidiarity and proportionality	2	2
	User-centricity	2	1
	Inclusion and accessibility	2	2
	Security and privacy	2	1
	Multilingualism	2	0
	Administrative simplification	2	2
	Transparency	2	2
	Preservation of information	2	2
	Openness	2	2
	Reusability	2	2
	Technological neutrality and adaptability	2	1
	Effectiveness and efficiency	2	2
	Total	**24**	**19**
Conceptual Model	Does the NIF contain a conceptual model?	2	2
	Is the conceptual model a component-based service model? (e.g. SOA)	2	2
	Does the NIF encourage the use of common schemes to interconnect loosely coupled service components.	2	2
	Does the NIF encourage to put in place the infrastructure to interconnect loosely coupled service components?	2	2
	Does the NIF encourage to make the authentic sources of information available to others?	2	2
	Does the NIF encourage access and control mechanisms to ensure compliance to security and privacy legislation?	2	2
	Does the NIF encourage the development of interfaces to authentic sources that are aligned at semantic and technical level?	2	2
	Total	**14**	**14**
Interoperability Levels	Does the NIF describe the four levels of interoperability?	2	1
	Does the NIF impose to consider all relevant legislation related to data exchange?	2	2
	Does the NIF describe that the business processes are documented in an agreed way in order for other administrations to understand the overall business process?	2	2
	Does the NIF encourage to agree on how these processes will interact among the different levels of public administrations?	2	2
	Does the NIF encourage public administrations to clarify their organisational relationships as part of the establishment of a (European) public service?	2	2
	Does the NIF encourage public administrations to agree on change management processes to ensure continuous service delivery.	2	2
	Does the NIF encourage the usage of a common taxonomy of basic public service?	2	2
	Does the NIF encourage public administrations to support the establishment of sectorspecific and cross-sectoral communities that aim to facilitate semantic interoperability and that share results on national and European platforms.	2	2
	Does the NIF encourage public administrations to agree on the formalised specification to ensure technical interoperability when establishing European public services.	2	2
	Total	**18**	**17**
Interoperability Agreements	Does the NIF encourage: - Interoperability agreements to be based on existing formalised specifications? Or - if they do not exist, to cooperate with communities working in the same areas.	2	2
	Does the NIF encourage Public administrations to use a structured, transparent and objective approach to assess and select formalised specifications?	2	2
	Does the NIF encourage public administrations to prefer open specifications, taking due account of the coverage of functional needs, maturity and market support?	2	2
	Does the NIF encourages public administrations to lead or actively participate in standardisation work relevant to their needs?	2	1
	Does the NIF encourage public administrations to agree on minimum service requirements for secure data exchange?	2	1
	Total	**10**	**8**
Interoperability Governance	A governance framework exists to control the interoperability activities across administrative levels.	2	2
	Total	**2**	**2**

NIF Monitoring

Radar chart comparing EIF and MS across Principles, Conceptual Model, Interoperability Levels, Interoperability Agreements, and Interoperability Governance.