

e-PING – Brazilian Government Interoperability Framework

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A Critical Assessment

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Introduction

The Brazilian Government has developed, since 2005, a project to define standards for interoperability among governmental information systems. This project is called *e-PING – Brazilian Government Interoperability Framework* – and has been aligned with similar initiatives that have been developed in other countries.

This project shall contribute to the modernization of digital information processing and digital service provision from the Federal Government in Brazil, and has potential to improve the effectiveness of these activities, which shall become more useful to larger portions of the population and of organizations that may be interested in interacting with public agencies through Electronic Government processes.

One concrete outcome of this project has been a series of publications containing partial specifications of the proposed interoperability standards for governmental agencies. These publications have been displayed for public consultation for specified periods of time, when any interested citizen or organization can record criticisms and comments about the initiative and each published version of the interoperability standards. This procedure shall lead to continuous and consistent improvements on the proposed standards, as well as on the proposed processes to adopt them.

In the present article, we present some considerations about the latest published version of the *e-PING* interoperability framework, namely the Draft Version 2010. These considerations follow the structure of the document that is being analyzed. To make this article a little more concise, we shall refer heretofore to the document as *e-PING Document*, and to the whole project as *e-PING Architecture*.

1. e-PING Presentation

At the *Presentation* section of the *e-PING Document*, the goal of the *e-PING Architecture* is highlighted: the definition of a *minimal* set of premises, policies and technical specifications for service interoperability in the Brazilian Federal Electronic Government initiative. In this section of the document we can also find an explicit commitment to ensure the alignment of the *e-PING Architecture* with the needs and interests of the society as a whole, as well as with the evolution of relevant markets and technologies, with emphasis on markets and technologies related to ICT.

This approach seems very appropriate to develop interoperability standards. The minimization of restrictions that naturally result from standardization shall maximize the possibilities for actual interoperability, as relevant services, formats and products shall not be unnecessarily excluded from the family of acceptable artifacts for interaction with the public agencies.

The specification of a minimal set of premises, policies and technical specifications seems strategically adequate, as it can be regarded as the core specification of extensible standards, thus allowing that richer and more specific standards can be built, grounded on and compliant with the *e-PING Architecture*, which can, depending on technical, political and commercial circumstances, grow to complete software solutions, which can be open source or provided by specific vendors. Hence, we understand that the *e-PING Architecture* shall be carefully designed in order to avoid restraining conditions and rules which can, in the future, hinder its extensibility and universality.

2. e-PING Introduction

At the *Introduction* section of the *e-PING Document*, the conceptualizations of interoperability that have been adopted for the *e-PING Architecture* are presented. These conceptualizations have been extracted from similar projects that have been developed in countries such as Australia and the United Kingdom, as well as documents that have been prepared by standards specification institutions – such as ISO – and specifications of architectures such as CORBA.

Not surprisingly, the most encompassing conceptualizations can be found in national Electronic Government projects such as those under development in Australia and the United Kingdom, due to the broad nature and inherent complexity of these projects. These conceptualizations include issues of technical, semantic and organizational interoperability. Institutions such as ISO and those responsible for the specification of architectures such as CORBA, apparently, focus primarily on technical interoperability.

One should expect that the *e-PING Document* should feature characteristics that would be similar to the equivalent documents that have been prepared by Australia and the United Kingdom. Indeed, we praise the initiative of the Brazilian Federal Government, to align the *e-PING Document* with the British *e-GIF – e-Government Interoperability Framework* specification.

According to the British *e-GIF* document, interoperability is characterized as *coherent exchange of information and services between systems*, in such way as to allow the replacement of *any component or product used within an interface with another of a similar specification while maintaining the functionality of the system*.

This characterization, in our view, fully expresses the aims of the *e-GIF* initiative, and could be adopted in its entirety in the *e-PING Architecture*. We consider particularly interesting the proposition to build a flexible and extensible architecture, in which different products and components can be interchanged, as long as the overall functionalities of the system are preserved.

One relevant requisite for this proposition to become concrete is the acceptance, within the *e-PING Document*, of different formats and accessibility resources for the exchange of documents and services, so that citizens and organizations that may be interested in interacting with the public sector can do so without having to adapt their own procedures and/or organizational practices.

3. e-PING Scope

In this section of the *e-PING Document*, it is clearly stated that this document aims exclusively at the specification of standards for interoperability, connectivity and interchange of data and services. This clear definition of scope aligns well with the proposition to define a minimal set of premises, policies and technical specifications for interoperability in Brazilian Electronic Government systems.

Interoperability is essentially a multilateral process, and through it the Brazilian Government shall gain access to information from the society as a whole, from other governments and from international bodies and organizations. This is a relevant issue in the technical specification of the *e-PING Architecture*, as it supports the goal of specifying a broad and inclusive architecture for interoperability. As a consequence, we can expect to find in the *e-PING Architecture* mechanisms to maximize the capability to accept different formats for data and services to interoperate with the Brazilian Electronic Government resources.

We also find, in this section of the *e-PING Document*, information that the Brazilian Government is developing a maturity model to monitor the effective utilization of the standards defined in the *e-PING Architecture*. This initiative is certainly relevant and praiseworthy. Until the latest version available of the *e-PING Document*, however, no further details of this maturity model have been published. It is certainly of high importance that the maturity model adopted by the Brazilian Government be aligned with international models and standards, so that the Brazilian experience can contribute as well as benefit from similar practices that have been developed in different countries.

4. e-PING General Policy

The general policies presented at the *e-PING Document* take into account technical, semantic as well as organizational issues, and this breadth of consideration of relevant issues is certainly evidence of the high quality of the project that has been developed by the Brazilian Government.

Some specific points, however, deserve further attention:

Preference to adoption of open standards: the preference to adopt open standards in the specifications that are proposed in the *e-PING Document* is a sound initiative, as it shall be helpful to ensure interoperability. The precise intended meaning for *open standards* in this document, however, could be further explained. A reasonable interpretation for this term is that open standards are those standards in whose specifications can be accessed. No further access rules are necessary in order to characterize a set of standards as open. For example, in order for a set of standards to be open it must not necessarily be in public domain, nor the access to its specifications must be provided at no cost. An additional requirement for the classification of a set of standards as open could be, nevertheless, that the access to its specifications be assured by an internationally accredited body, such as e.g. ISO.

Despite the terminological similarity, open standards are, therefore, completely different from open source software. As is well known, the Brazilian Government has advertised broadly its support to open source software development and adoption by public agencies. This choice should not, however, be confused with the guideline proposed in the *e-PING Document* in favor of open standards.

Public and/or free software: the specification of software production methodologies and software commercialization strategies seems out of context in a document devoted to the specification of interoperability standards, whose declared goals are “relevant specifications to ensure interconnectivity between systems, data integration, access to Electronic Government services and content management”. We consider that the inclusion of such issues should be avoided in the *e-PING Document*.

Industry support: the *e-PING Document* has, as a declared goal, the pursuit of solutions that would be supported and acknowledged by industry. The *e-PING Document* could be complemented by detailed specification of the methods that shall be employed to verify the extent to which each proposed solution has support from industry.

5. e-PING Project Organization

The *e-PING Document* is organized in five parts. Each part has been under responsibility of a specific working group, whose members are specialized professionals connected to public agencies. Until now, experts from outside public agencies – for example, academic researchers and international scholars – have not been explicitly involved in the construction of the *e-PING Architecture*. There are indications, however, that this position of the *e-PING Architecture* management policy is about to change.

6. e-PING Project Management

The *e-PING Architecture* management body has been responsible, among other issues, for the management of interactions with international and national specification organizations. The list of organizations with which regular interaction has been maintained is not presented in its entirety at the *e-PING Document* (only a partial list is explicitly presented in the document).

The clear and open definition of this list can be of great importance for software vendors and suppliers that may be interested in creating solutions for Electronic Government in Brazil, as they constitute an important reference for software producers to ensure that their products can be certified as interoperable according to the *e-PING Architecture*.

In section **5.4.1 Selection and Certification of Technological Standards**, we find in the *e-PING Document* a classification of existing standards according to five categories. A similar classification can be found in the British *e-GIF* document, however, in that document the standards are classified in only four categories. It is arguable whether the additional category, included in the *e-PING*

Document and which has no equivalent in the *e-GIF* document, should be preserved in future versions of the Brazilian document.

The four categories that can be found in the *e-PING Document* as well as in the British *e-GIF* document are:

1. **A – Adopted:** a standard that has been classified as *Adopted* has been stabilized as part of the interoperability architecture. At the moment, for the *e-PING Architecture*, in order to classify a standard as *Adopted* the Brazilian Government may request certification from an accredited authority, but this is not a stringent requirement. We consider that a mandatory request for third party certification to classify a standard as *Adopted* could be a useful policy for the *e-PING Architecture*, as it would ensure the necessary credibility levels that such standards must have.
2. **R- Recommended:** a standard that has been classified as *Recommended* has been selected to be part of the interoperability architecture, but has not been certified to become classified as *Adopted*, neither by a third party certification authority nor by any organization from within the Government.
3. **S – Study:** a standard that has been classified as *Under Study* is under process of technical evaluation and may, if approved, be upgraded to *Recommended* or *Adopted* in the future.
4. **F – Future Study:** a standard that has been classified as *Future Study* has been shortlisted for future evaluation, i.e. for the moment it is not yet under evaluation, but it shall be reclassified as *Under Study* in the near future.

The category that we find in the *e-PING Document* but that has no equivalent in the British *e-GIF* document is named **T – Transition**. A standard that has been classified as *Transition* refers to a standard that is actually in broad utilization at the moment, but which, for strategic reasons, shall be removed from the *e-PING Document* in the future. One possible justification, for example, for a standard to be classified as *Transition* can be because its specifications are not accessible by any means.

We argue whether this category should continue to be part of the *e-PING Document*. Our view is that standards that do not comply with the technical requirements of the *e-PING Architecture* could simply do not appear as explicit options in the *e-PING Document*. Moreover, in the British *e-GIF* document, most lists of proposed standards are open, i.e. they contain an entry that includes any further standards that comply with the technical requirements of the proposed architecture. We do not find similar entries in the Brazilian document, and we believe that this could be an interesting improvement to add to the *e-PING Document*.

In any case, if the Brazilian Government does decide to keep the *Transition* classification for standards in the *e-PING Document*, we consider important that careful and detailed explanations for such classification of standards be included in the specifications, lest the owners of those standards may become suspicious that external interests and forces are influencing the technical precision of the specification of the *e-PING Architecture*. Considering the interest of the Brazilian Government to broaden the capillarity of its Electronic Government project through the specification of interoperability architecture, explicit actions to ensure support from industry should always be taken into high regard.

7. Interconnectivity

In early versions of the *e-PING Document*, all standards related to interconnectivity were classified as *Recommended*. Later versions also included standards classified as *Under Study*. We consider important to have permanently new standards classified as *Under Study* in this section, as interconnectivity technology has evolved very rapidly. In the latest version of the *e-PING Document*, however, we find few interconnectivity standards classified as *Transition*. For the reasons referred to in previous sections of this article, we argue whether the inclusion of standards under this classification is necessary.

8. Security

All standards related to security in the latest version of the *e-PING Document* are classified as *Recommended*, *Under Study* or *Future Study*. We consider this classification very appropriate, considering the rapid technological evolution of security standards.

9. Data Integration and Access

We find, in the *e-PING Document*, technical specifications of formats for integration and access to data and documents. Apparently, the specifications that we find in the *e-PING Document* were inspired by what we find in the British *e-GIF* document, more specifically by what we find in Table 6 of the *e-GIF Technical Standards Catalogue, version 6.2*. Some differences can be found between these two documents, however, that are worth highlighting. It is arguable whether the Brazilian Government has improved the quality of the *e-PING Document* by adding these differences, and therefore it could be interesting either to backtrack the Brazilian specifications to align them with the British documentation, or to provide the users with further details that could clarify the reasons for the inclusion of these differences.

As stated previously, one important difference is that the British specifications are open, i.e. they include further formats that may not be explicitly referred to in the documentation, provided that they are compliant with the technical requirements of the interoperability standards that have been proposed. Similar statements cannot be found in the Brazilian documentation. Moreover, a few formats have been classified as *Transition* in the *e-PING Document*, without further explanations, and, to our view, as stated before in the present article, this technical deficiency could be avoided.

Some standards in the *e-PING Document* are relatively new and not so broadly used. We advocate that the inclusion of standards with such characteristics should be carefully justified, based on technical grounds, so as to ensure the users that the *e-PING Document* is free of any sort of bias that could support specific vendors and/or producers of software and document formats in detriment of others.

As is well known, we have seen in various forums a debate in which two competing formats for office documents (texts, spreadsheets and presentations) have fought for their users. The two competing formats are:

1. The *OpenDocument Format – ODF* – supported by *OASIS* (Organization for the Advancement of Structured Information Standards), acknowledged by *ISO* and adopted by the open source *OpenOffice Suite*, which is a set of software products that provide to users the required functionalities to prepare and use office documents; and
2. The *Office Open XML Format – OOXML* – supported by *ECMA International*, also acknowledged by *ISO* and developed and adopted primarily by Microsoft and related companies.

Each of these standards to format documents has its advantages and drawbacks. Each of them also counts on large number of users. Our view is that any document that specifies interoperability standards should include both standards as alternatives to format office documents. Obviously, this should also be the case for the *e-PING Document*.

10. Organization and Interchange of Information

We find, in the set of standards for information interchange in the *e-PING Document*, the Unified Modeling Language – *UML*. Even though some diagrams that belong to *UML* could be adapted for information exchange, it is worth remarking that this diagrammatic language has been developed primarily to share information about systems design. Hence, we consider a little surprising that this language is included for the exchange of information in a document such as the *e-PING Document*. Perhaps the authors of this document could add further explanation about how exactly they have

considered that this language could be used, and what diagrams belonging to *UML* have been considered in this utilization within the *e-PING Architecture*.

We also find, in the *e-PING Document*, specifications of contents that shall be exchanged – in the form of a list of relevant subjects for the Electronic Government project in Brazil, and a catalogue of data standards for these subjects. These contents are classified as *Adopted*, i.e. they have already been analyzed and certified for use, possibly by third party authorities. We consider that such classifications may be somewhat premature. In any case, in order to safeguard the credibility of the whole project to which the *e-PING Architecture* belongs, we would consider important that the certification procedures and certification authorities involved in the definition of these formats and contents to be part of the *e-PING Document* were explicitly included in the document.

11. Areas for Integration with the Electronic Government

Finally, we find in the *e-PING Document* the semantic specification of standards to interact with the Brazilian Government electronically. This specification is particularly relevant for information and service providers that may be interested in cooperating with the Electronic Government project, and through this project with the Government as a whole.

We consider the inclusion of this specification particularly relevant for the *e-PING Architecture*. We also consider that there is still ground for improvement of the *e-PING Document* in this specific issue, so that further technical details and guidelines can be found, as well as the alignment with similar international initiatives can be assured.

In latest versions of the British *e-GIF Document*, we find certified test suites for service and data suppliers to ensure that their systems comply with the *e-GIF* standards. We consider that similar initiatives could be developed for the *e-PING Architecture*.

All in all, we praise the Brazilian initiative to push forward the development of the *e-PING Architecture*. We hope that the comments and criticisms included in the present document can be helpful to improve further the already high quality of the *e-PING Document*.

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