**A Standards Matrix**

In the most general sense, a standard is something established by custom, general consent or authority as a model to be compared against, a rule for measuring the quantity, weight, extent, value or quality of something. When we speak of technical standards, we’re speaking of published documents that establish specifications and procedures designed to maximize the reliability, interconnectivity, interoperability, and performance of materials, products, methods or services.

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| **Type** | **Origin** | **Process** | **Authorship** | **How is it implemented?** | **How is conformance determined, enforced?** | **Who is affected?** | **What is impact on those affected?** |
| Norm/ethic/tradition (can be a “practice”) | need for functional society | informal | members of a society | interpretation | parental, societal pressure | members of a society | Allows for cohesion and interpretation |
| A Practice or Best Practice | practical experience | informal | practitioners | practice | voluntary | self-selected | provides norms for processes. Encourages interoperability and allows for fluid evolution |
| Ad hoc Specification | need for compatibility | formal, informal | practitioners | as built | non binding | practitioners | Widely adopted process, may be a best practice |
| Standard Profile/Extension | need for more specificity | formal, informal | standards adopters | Software | conformance clauses | specific community | Consistency of implementation, easier to assess conformance |
| De jure standard | compatibility, interoperability, reliability, | managed development | affected stakeholders | Device, procedure | conformance clauses | narrow/broad stakeholder community | Provides formalized, stable process descriptions for production and interfaces |
| Code | need for safety, reliability | deliberations | responsible officials | practice | law enforcement | local jurisdiction | Defines requirements for process implementation for safety and conformity |
| Policy/Law | public interest | lawmaking | lawmakers | practice | law enforcement | jurisdiction | Legal requirements for societal safety and economic growth |
| Treaty | international relations | negotiations | government officials | practice | Economic, military | nations | Establishes relations between different governing bodies for security and commerce. |

The table above attempts to place formal (*de jure*) standards in the context of many other types of standards. *De jure* standards are distinguished mainly by the fact that they were created under processes managed by a standards development organization (despite the name, this doesn’t mean *de jure* standards necessarily have the force of law). The benefit of working under a Standards Development Organization, such as ISO or IEEE, is that it provides the rules and governance that are needed to ensure fairness and transparency, and the mechanisms to assist in the distribution and maintenance of the standard. Working with an SDO can also attract broad stakeholder representation and provides a means to assess conformance to the standard. Example of evolution from Ad Hoc ( to de jure is the PDF. It started as a widely used  ad hoc (de fact standard by Adobe and  In 2005, PDF/A became a de jure standard as ISO 19005-1:2005. In 2008 Adobe's PDF 1.7 became ISO 32000-1:2008.

Further comment: De facto comes from a Latin phrase meaning “in reality or as a matter of fact.” In legal contexts, de facto describes what really happens, in contrast with de jure, which explains what the law says should happen. (reference

There are also de facto standards, which can be just as rigorous as de jure standards, and have influence by virtue of their widespread adoption. A best practice can come to be recognized as de facto through widespread adoption but may be more loosely documented, e.g. through a journal article or technical report. Nearly all types of standards can be initiated through community activities (i.e. bottom-up) or through the needs of an industry, organization or government (i.e. top-down).

Open standards principles emphasize the importance of giving all views due consideration and that no one interest is prioritized over all others. Records of decisions and the materials used in reaching those decisions should be made available to everyone. The public should also be given an opportunity to provide comments before a standard is approved and adopted.

Profiles define combinations of elements derived from a set of one or more base standards for the purpose ofspecifying the elements and options that are necessary to accomplish identified functions for purposes such as interoperability; and promoting uniformity in the development of conformance tests for systems that implement functionality of profiles.

A profile:

a) may restrict the choice of options defined in base standards to the extent necessary to achieve the objective of the profile;

b) shall not specify any requirements that would contradict or result in non-conformance to the base standards to which it refers; and

c) may contain conformance requirements which are more specific and limited in scope than those of the base standard to which it refers.

Thus, by definition, conformance to a profile implies conformance to the set of base standards, but conformance to the base standards does not necessarily imply conformance to the profile

An extension, as its name implies, extends an existing standard through addition of new elements or codelists. It can also impose a more stringent requirement on elements than is in the base standard, such as making some elements mandatory whereas they are optional in the base standard. Conformance to an extension does not imply conformance to the base standard.