A DEFINITION OF AN OPEN CONSORTIUM FOR THE THE INFORMATION AND COMMUNICATIONS TECHNOLOGY (ICT) INDUSTRY: A WORKING PAPER

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EXECUTIVE SUMMARY:

I. Standardization is an essential and growing element in the success of the Information and Communications Technology (ICT) industry. The success of the Internet, the World Wide Web, e-Commerce, and the incipient wireless revolution are all predicated upon successful standardization. A majority of the standards that drive these evolving areas of technology are created in consortia.

II. A definition of "consortia" is unclear, and the criteria for judging what makes specifications created by the consortia legitimate needs clarification.

III. Six criteria for a "good" or legitimate consortium are identified. The six criteria are all demonstrable and measurable.

IV. The creation and acceptance of these six criteria will permit a quantifiable analysis of the legitimacy of consortia and their specifications to occur.

THESIS OF THE PAPER

Standardization is essential to the growth of the IT industry. Within the IT industry, well-developed consensus consortia standards are necessary to continue to produce open specifications which feed the growth of the information society. Six criteria to judge the legitimacy or goodness of a consortium and its specifications are presented. It is hoped that these six criteria, if accepted, will form the basis for a wider acceptance of consortia output by both the ICT industry and national and regional governments.

INTRODUCTION - THE STANDARDIZATION ENVIRONMENT IN THE INFORMATION AND COMMUNICATIONS TECHNOLOGY (ICT) INDUSTRY:

Standardization is essential to the Information and Communications Technology (ICT) industry. The ICT industry relies upon Standards Setting Organizations (SSOs) to produce the full panoply of standardization activities - from standard and open specification creation, conformance, interoperability testing, certification, and specification requirements gathering - to create interoperable products and services which satisfy user needs for complex information systems. Standardization - the product of SSOs, includes the output of many different types of organizations - from commercial joint ventures, consortia, Standards Developing Organizations (SDOs), and Open Source activities. All of the activities sponsored or created by SSOs in these areas are necessary if open, competitive, and interoperable services and products are to be offered to the market.

The fundamental goal of standardization within ICT is to provide a competitive product or service to the market, allowing multiple vendors to provide similar services that will permit and encourage interoperation of systems and information. By using open standardization (that is, standards and specifications which provide open and interoperable product and service solutions), the market is provided choices in technology, direction, and level of innovation, while receiving the benefits of interoperating and manageable information systems.

THE ROLE OF CONSORTIA

Within the ICT industry, consortia began to make an appearance in the mid 1980's, as the ICT industry began to move out of the "mainframe" environment and out of the plain old telephone service (POTS). The two disciplines began to share concepts, practices, and programs. At the same time, the dependence on the ICT industry grew - and grew some more. The ICT industry has now become a major force in the world's economic arena; the ICT industry has even been awarded its own "Schumpeter's wave" by the Economist newspaper.[1] The Internet and the World Wide Web, object oriented programming and object oriented languages, complex hardware and LANs - all are based on standards and are growing geometrically. The Information Technology revolution has succeeded in becoming a significant economic and social force – one that is driven by the ability to interoperate and interconnect, which are the children of standardization.

To feed this growing and diverse need for standards, the industry has created a multitude of Standards Setting Organizations (SSOs). Some of these groups are transient; others are longer lived. All concentrate on the creation of specifications which are used by the industry to meet user needs. Of these organizations, many are classified as "consortia", a generic term that is used to cover a broad range of organizations which produce specifications to fuel the continued growth of the ICT industry. As The Economist has pointed out, "…the Internet has turned out to be a formidable promoter of open standards that actually work, for two

reasons. First, the web is the ideal medium for creating standards; it allows groups to collaborate at almost no cost, and makes the decision-making more transparent. Second, the ubiquitous network ensures that standards spread much faster. Moreover, the Internet has spawned institutions, such as the Internet Engineering Task Force (IETF) and the World Wide Web Consortium (W3C), which have shown that it is possible to develop robust common technical rules."[2] These features have made the IT community turn to consortia and similar structures for their standardization needs, in both hardware and software. The creation of highly open, highly visible specifications - widespread in their adoption and use - is essential to the continuing evolution of the ICT sector and ICT industry.

A second trait of consortia is their dependence upon the market, rather than its institutional heritage, for relevance. A consortium succeeds or fails by its ability to attract members to accomplish its technical agenda. It receives little or no funding other than what its membership is willing to pay; money received from the government is rare, and is usually in return for some exact service that the consortium renders to a specific government agency in the role of a contractor.[3] While this dependence upon its members for financing can be seen as a limitation on the consortium's freedom of action, it reflects the state of the market; if all of the commercially important members (those who would implement the specification) walk away, the consortia is doomed to extinction. The consortia must be market responsive to survive, which is another reason that this type of organization is the preferred standardization mechanism f the ICT market.

However, this forces a consortia to walk a delicate balance between an openness that leads to a delayed, and hence unused specification, and a financial dependency leading to a closed organization producing constrained specification. This then leads to the question of how to tell if a consortia is a "good consortia" - one that both serves the larger market while retaining its ability to produce open and unencumbered specifications.

TOWARDS A DEFINITION OF A "GOOD CONSORTIUM"

I believe that there are six major criteria for a "good consortium".[4] These are:

1. The consortium must develop technical specifications.
2. The consortium must be some type of legal entity.
3. The consortium must have a well-defined, legally acceptable set of procedures and processes.
4. The consortium must have a clear and legitimate IPR policy that requires, at a minimum, RAND licensing of all IPR included in its specifications.
5. The technical specifications created by the organization must be implemented by two or more competing entities prior to specification release, following widespread public review of the specification.
6. There should be reference implementations, competing implementations, and test methods to validate conformance as appropriate.

I'd like to examine each of these in more detail, giving the rationale for inclusion of that particular attribute as a necessary part of a "good consortium".

1. The consortium must develop technical specifications.

The concept of a "consortium" used in this paper derives from several taxonomies developed in the previous decade, all of which were focused on the Information Technology sector. Weiss and Cargill (1992) identified three separate types that focused on implementation, application, and proof-of-technology[5]; Updegrove (1995) identified research consortia, specification groups, and strategic consortia[6], while Ketchell (2001) identified specification creating consortia and "fora" (consortia whose function was to define user and market requirements for further technical development)[7]. The three taxonomies share enough common definitional concepts to constitute a basis for development of a model for this paper. The key to all of the definitions is that the consortia MUST produce a useable and implementable technical specification for use by the ICT market. While this might seem to be patently obvious, there are consortia that are created to popularize a market solution, to gather market requirements, or to educate members in a particular technology. These fall outside of this definition. The first and primary criterion for "a good consortium" is the existence of technical work leading to an open and implementable specification.

2. The consortium must be some type of legal entity.

Updegrove notes "Effective, efficient, and representative evolution of standards by consortia is impossible without an appropriate structure of administration and technical decision making."[8] In many cases, the administrative structure is tied to the act of creation. Many consortia are created either under the provisions contained in the National Cooperative Research and Production Act of 1993 or under State Laws; all of these delimit specific responsibilities for consortia in exchange for a guarantee of specific rights.[9] These rights are translated into rules, and it is these rules that provide a look at the nature of the consortium - its openness policy, its governance mode, its mission and its charter. The document making the consortium a legal entity is the document from which all legitimacy ultimately springs. These rules should be available for review by the public; secret articles of incorporation rightly give pause, and invoke a spectre of something illegal.

In the case of a non-U.S. consortium (such as the Open Mobile Alliance), there is a similar, but not quite as focused, body of law resident in the United Kingdom that provides the same protection. The same is true with most other G7 countries.

What is sought in all cases, however, is a document that indicates some form of reality in law - something that would indicate that there is a legal basis under which the consortium operates and which subjects it to

some form of governmental oversight. The intent is to ensure that the consortium is serious by its commitment to achieve legal standing, and is prepared to accept both the benefits and penalties incurred by this commitment.

3. The consortium must have a well-defined, legally acceptable set of procedures and processes.

The consortia processes must be rigorous and rigorously enforced, since they must comply with the provisions contained in their charters. Consortia operate as strictly under their rules as formal SDOs operate under theirs. If they fail to keep their processes legitimate, they risk all of their members and their own existence. The emphasis that consortia place upon following their rules is illustrated by the fact that, as of this writing, there has never been a successful suit brought against a consortium for anti-trust activities.[10] "The heart and soul of any consortium may be found in a humble home: its bylaws and charter. Although a few important rules may come to rest in a membership application, most of the regulations and rights of the organization will be found in these legal documents. Whether or not they are carefully conceived will determine whether or not the organization is easily managed, whether it incurs needless exposure to its members under antitrust laws, whether its members feel themselves fairly represented and therefore renew their membership, and whether or not the organization is sufficiently flexible to evolve and flourish."[11]

The set of governing rules explains how the consortium works, how its members are treated, and the rights and responsibilities of the members. Definition of how the consortium creates its technical specifications - including the methodologies of the creating committee's -must also be present. While it is acceptable to have various levels of membership (and most consortia do), the criteria for gaining these levels must be clear and unambiguous. The rights and duties of each level of membership must be explained and must be valuable enough to attract and hold members. There is also the necessity to ensure that there is no exclusivity on joining the consortium; anyone meeting the requisite entry requirements must be allowed to join and participate with the same rights, under the same terms and conditions as other members.

4. The consortium must have a clear and legitimate IPR policy that requires, at a minimum, RAND licensing of all IPR included in its specifications.

Examination of the intellectual property (IP) regime of the consortium is also necessary. The consortium must have Intellectual Property Rights (IPR) no less rigorous than those of the International Organization for Standardization (ISO). ISO patent policy[12] mandates, as a minimum, commitment to Reasonable And Non-Discriminatory (RAND) licensing by participants. How RAND is implemented is a matter left to the organization, as are any other rules governing IPR. However, the rules must be complete, spelling out the requirements of members, the penalties for non-compliance, and remedies available to members for such non-compliance.[13] Basically, there must be clear assurance that the holder of IPR will not attempt to treat other consortia participants and users of the standard unfairly.

5. The technical specifications created by the organization must be implemented by two or more competing entities prior to specification release, following widespread public review of the specification.

Because a consortium is composed of like minded organizations who want to complete a specification, there may be a problem of determining how to prevent an entity from capturing (or creating) a consortium to foist off proprietary specifications as "open" and standard. The normal method of accomplishing this has been to ensure that " directly and materially affected " have a chance to participate in the creation of the specification[14]. **This definition is not testable or supportable in the ICT arena. The industry does not know if all parties are aware of a specification; most of the industry participants are not aware of all of the activities happening in technology advances, let alone in standardization**. Based upon this, the classic definition of "open" does not seem to be applicable to the post 1995 world of ICT standardization.

This forces a search for a new way of achieving the goals for which we engage in standardization. It is our basic belief that the fundamental role for standardization in the ICT sector is to provide users multiple, interoperating, competing implementations of any specification that a "good consortium" produces. The creation of these independent implementations go to the heart of the ICT standardization need - they demonstrate that the specification is open (or else multiple independent competing implementations could not exist), that the market is being given a choice of implementations from which to choose, that the RAND methodology is probably working (since the market will have choice in the RAND or Royalty Free schemes proposed for the technologies being implemented), and that the specification is actually useable (which validates the first requirement of a consortium).

The widespread public review of the specification can be accomplished through use of the World Wide Web and/or the Internet. The W3C and the IETF are two of the major consortium which use this method for ensuring that anyone who wishes can review and comment on the specification. The ability of the users of ICT standardization to find and comment on specifications available on the web is significant; the review far exceeds the current methodologies of hard publication to a small standardizing audience. The use of a "web based review process" makes the nascent specification available to anyone who has access to the Internet. This - if coupled with a methodology of logging and responding to comments - meets and exceeds the requirement for any "directly and materially affected party" to be allowed to participate and review.

6. There should be reference implementations, competing implementations, and test methods to validate conformance as appropriate.

The purpose of the conformance testing regime is to ensure that organizations claiming conformance to the specification actually do conform. It is too easy to claim conformance to a specification with no proof;

there are no methods of validation available for use within most standardization activities. The inclusion of a method to validate conformance to a specification works to the principles of interoperability and openness. However, it must be noted that the requirement for testing is contentious, as providers in the IT sector tend to favor "self testing and self certification" to testing provided by third parties. Allowance should be made to allow the consortium members the right to determine what level of testing they want; at the same time, the market, which on occasion has demanded third party testing, will be the ultimate arbitrator of the decision.

CONCLUSION:

The primary test for openness should be the outcome of the consortia – (1) the specification should provide an open (RAND minimum) reference implementation, (2) two or more competing implementations should exist, and (3) there should be, if appropriate, a testing regime to ensure interoperability among the various implementations. This approach focuses on the rationale for standardization - that is, there should be a mechanism by which the users have a choice of implementations from which to choose, providing guaranteed alternative sources for critical products.

And, in the ICT sector, with thousands upon thousands of implementers, the specification - unencumbered, unambiguous, and admitting of easy implementation - is key to market acceptance and survivability. The fact that the U.S. has a majority of ICT consortia and a majority of innovative ICT implementations are not unrelated; both emphasize the successful market acceptance and implementation of standardized specifications as a criteria for success.

[1] *The Economist Newspaper Limited*, London, Volume 350, Number 8107, "A Survey of Innovation in Industry", p. 6

[2] The Economist Newspaper, "The Age Of The Cloud, Survey Of Software", Special Supplement, Apri14-20th, 2001, 111 West 57th Street, New York, NY 10019-2211

[3] Spring and Weiss discuss the problems of private sector funding of the formal standards organization in their article in *Financing the Standards Development Process* pp. 289-320, in Standards Policy for Information Infrastructure, edited by Kahin, Brian and Abate, Janet, MIT Press, 1995.

[4] The rationale for this list of attributes derives from conversations with staff members of the House of Representatives Sub-Committee On Technology, Environment, and Standards, Daniel Weitzner of W3C, Stephen Oksala (Vice President, Society of Cable Telecommunications Engineers), Oliver Smoot (Chairman of the Board, ANSI), Dr. Mark Hurwitz (President, ANSI), Dr. D. Linda Garcia (Georgetown University), and others on how to describe a "good consortium". It is based upon experience (both good and bad) of the participants in many discussions, but especially to those in the W3C Patent Policy Working Group.

[5] Weiss, Martin and Carl Cargill. "Consortia in the Standards Development Process" *Journal of the American Society for Information Science 43(8) (1992)*:559-565

[6] Updegrove, Andrew, *Consortia and the Role of the Government in Standard Setting*, pp. 321-348, in Standards Policy for Information Infrastructure, edited by Kahin, Brian and Abate, Janet, MIT Press, 1995,

[7] Ketchell, John, at The CEN/ISSS web site, http://www.cenorm.be/isss/Consortia/Surveyshort.htm

[8] Updegrove, op.cit., p. 338

[9] The state law invoked depends, in a large part, I believe, on which coast the initiators engaged to initiate the consortia reside. I believe that all consortia that meet the "good consortia criteria" are also non-profit organizations.

[10] The closest successful suit was the Addamax anti-trust suit that was lost and lost again on appeal. (United States Court of Appeals For the First Circuit No. 97-1807, Addamax Corporation, Plaintiff, Appellant, V. Open Software Foundation, Inc., Digital Equipment Corporation, and Hewlett-Packard Company, Inc, Defendants, appellees, Appeal From The United States District Court For The District Of Massachusetts).

[11] Ibid., p. 338

[12] ISO rules state: If the proposal is accepted on technical grounds, the originator shall ask any holder of such identified patent rights for a statement that the holder would be willing to negotiate worldwide licences under his rights with applicants throughout the world on reasonable and non-discriminatory terms and conditions. Such negotiations are left to the parties concerned and are performed outside the ISO or IEC. A record of the right holder's statement shall be placed in the registry of the ISO Central Secretariat or IEC Central Office as appropriate, and shall be referred to in the introduction to the relevant International Standard (see item *e)* below). If the right holder does not provide such a statement, the technical committee or sub-committee concerned shall not proceed with inclusion of an item covered by a patent right in the International Standard without authorization from ISO Council or IEC Council as appropriate. ISO/IEC Directives, Part 2, 1992 (as amended) [Annex A, A.2, b)] http://isotc.iso.ch/livelink/livelink/fetch/2000/2123/SDS_WEB/sds_ipr.htm

[13] A key element here is that consortia, because they may chartered in any number of nations, must also respect the IPR contained in the national laws. Just as Swiss law rules the interpretation of ISO rules, and U.S. law rules ANSI rules, so to are consortia bound be the underlying IPR of their nation.

[14] The standard definition of open is derived from the American National Standards Institute definition contained in ANSI Essential Requirements: Due process requirements for American National Standards Edition: January 2003, p.4 It is from Section 1.1. Openness: Participation shall be open to all persons who are directly and materially affected by the activity in question. There shall be no undue financial barriers to participation. Voting membership on the consensus body shall not be conditional upon membership in any organization, nor unreasonably restricted on the basis of technical qualifications or other such requirements.