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# ATTRIBUTES AND DYNAMIC DEVELOPMENT PHASES OF INFORMAL ICT STANDARDS CONSORTIA

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## ABSTRACT

Theoretical and empirical analyses about informal consortia are not yet able to entirely illustrate the informal standard setting landscape. This paper tries to provide a broad and comprehensive picture of informal standards consortia and their dynamic development in the past ten years. Analyses show that consortia have distinct characteristics which help to position and explain their existence in the standard setting context. Furthermore the observation of consortia survival identifies relationships between the formation, termination and merger of consortia and market development. The paper is thus able to reveal unique consortia features such as flexibility in formation and speed of reaction to market needs. Formal standardization is in contrast an often protracted process of development and negotiation. Involvement in informal standard setting is in less bureaucratic and allows, in respect to the tiered membership structures, a strategic influence from participating firms. These main insights justify a distinct research on the role of informal standard setting in the ICT industry.

## KEYWORDS

Standard Setting, Standards Consortia, ICT Industry, IP Policy, Technological Development

## 1. INTRODUCTION

In the past years the complexity and speed of technological development has constantly been increasing. Especially in the field of information and communication technologies (ICT), markets show evidence for a higher variety of products and solutions in a more frequent manner (David, 1996; Updegrave, 2008). The need for technological standardization is growing (Blind/Gauch/Hawkins, 2010), but the complexity and speed challenge companies in their coordination activities. Standard setting is an often complex process, which is highly dependent on consensus agreements between the participating organizations. These processes can take several years. Especially formal standard bodies are sometimes not able to keep up with the market pace (Cargill, 2002). Since fast changing markets needed more flexible solutions to set standards, the standard landscape has developed over the past twenty years (Updegrave, 2008). Today not only formal standard developing organizations (SDOs), but also informal industry driven standard setting organizations (SSOs), produce widely adopted and important standard solutions. Other than formal organizations, which produce so called “de jure standards”, informal consortia create and promote mostly “de facto standards” (Jakobs, 2004). The latter can further be distinguished in a “de facto standard” developed by a single firm and a “consortia standard”, where the standard is set by a group of firms (Bunduchi et al., 2008).

Formal standardization is often very time consuming and can take several years, whereas informal consortia are more flexible and able to anticipate technological development and thus set the standard right in time (Cargill, 2002). Even though informal standards specifications are agreed on without a formal accreditation, they can still be widely accepted and of great importance or even follow up a certain formal standard (Blind/Gauch/Hawkins, 2010). Yet, there is no common definition for an informal consortia and the consortia landscape has developed to be very heterogeneous in characteristics such as technical issues, structure,

members, transparency or IP policies (Cargill, 2002). Updegrave (2008) defines consortia as being “anything from a loose, unincorporated affiliation of companies, to an incorporated entity with offices, marketing, technical and administrative staff and a multi-million dollar budget”. He distinguishes between *specification groups* which agree to promote an industry standard, *research consortia* with the main intent to create and develop a technologic solution and *strategic consortia* which focus on the adoption of a technology or the formulization of a yet informal common practice (Updegrave, 1995).

In this paper the term SSOs is used for informal consortia which are not accredited by formal standard bodies such as ISO, IEC, IEEE, ETSI or ITU and meet the criteria set by the ISSS CEN Survey:

- The organization must be international in outlook and scope, not simply an instrument of single-nation policy,
- must have an active and international membership,
- must not be set-up specifically as a single vendor, government, or proprietary technology advocacy group,
- must be of importance to the areas of standardization or its processes CEN/ISSS (2009).

In Europe (Council of the European Union, 2000) and in the US (Center for Regulatory Effectiveness, 2000) informal consortia are recognized as being organizations that influence standard setting processes, but which are not officially recognized (Egyedi, 2001). So far there has not been much empirical work on the role of informal consortia. Earlier work mostly focuses on theoretical explanations for the existence of industry consortia (Cargill, Weiss 1992; Updegrave 1995; Hawkins, 1999; Bunduchi et al., 2008). More current research uses a case study approach and thus characterizes and compares the processes of informal consortia such as Updegrave (1995): *X Consortium and Open GIS Consortia*, Egyedi (2001): *W3C and ECMA*, Coulon (2004): *Symbian Alliance*, Anderson (2008): *ECMA, IETF, OASIS, OMG and W3C*, Koenig (2008): *FlexRay, Autosar and Jasper*, Grotnes (2009): *Open Mobile Alliance (OMA)*. Blind & Gauch (2008) accessed a dataset of more than 250 consortia to map the survival of consortia between 2000 & 2004 and found evidence for a complimentary relationship of formal and informal standard setting activities.

## 2. METHODOLOGY

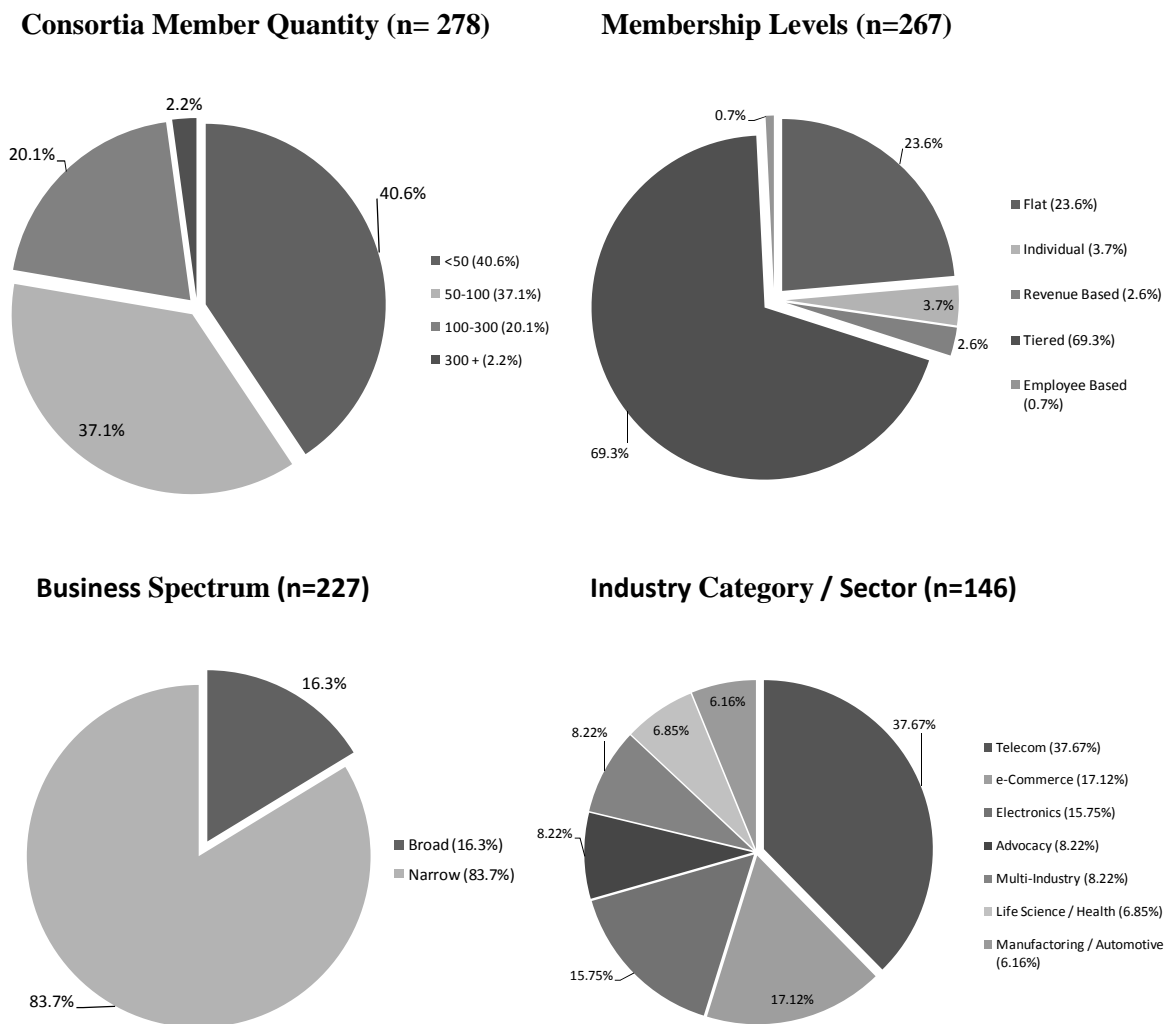
Since there has not been a comprehensive analysis of informal consortia, this paper uses a broad approach to illustrate the dynamic landscape of SSOs over the past ten years. The research is based on the use of two data bases that assemble more than 700 informal standards consortia since 1998. The CEN survey provides information on 435 informal ICT standardization consortia. These consortia have been selected based on transparent and objective selection criteria, which are stated above. The survey by Andy Updegrave provides information on 555 consortia, 276 of which are not covered by the CEN survey. Both surveys indicate the number and identity of consortium members (including 20.000 independent organizations with in total more than 35.000 consortium memberships), the tiering of membership, standard scope, technical category, industry sector, IP policy and years of existence. To get a complete picture of the informal standard setting landscape, information from both databases is used. However, to guarantee database compliance, time series analysis only uses information from fifteen editions of the ISSS CEN survey from 1998 until 2009. Furthermore, not all consortia could be classified in their respective attributes, since some consortia do not provide distinct information. Attributes such as industry sector, technical category, business spectrum and IP policy were only assessed from the CEN survey data. Information about member quantity and membership levels was carried together from both datasets as well as an additional internet research.

### 3. EMPIRICAL RESULTS

As of yet, the analysis is still descriptive and the main research goal is to illustrate and characterize the informal consortia landscape comprehensively. In contrast to formal standard bodies where structures are fixed and default, the formation process of informal consortia allows a variety of organizational choices.

#### 3.1 CONSORTIA CHARACTERISTICS AND ATTRIBUTES

The four charts in figure 1 give a vivid picture of informal ICT consortia characterized in member quantity, membership levels, business spectrum and industry sector. The two former attributes reveal information of the specific members such as quantity and member levels. Organization types and shares per member level are not displayed in the charts but integrated in the analysis. The latter two charts illustrate the sector and the scope of involvement.



**Fig1:** Characteristics and attributes of informal ICT standards consortia

Most consortia have a considerably low amount of members, since 77.7% have less than 100 participants, 20.1% have 100-300 members and only 2.2% list more than 300 members. A deeper look into the data shows that 93.56% of the members are vendors and other commercial entities, whereas universities and colleges account for only 2.52%, governmental entities for 0.17% and consumer groups for a stake of 3.75%. The chart of membership levels illustrates the hierarchical structures of consortia. 69.3% have tiered membership regulations, where the member levels can in general be differentiated into *Leaders*, *Followers* and *Spectators*. Using this classification by Updegrave (2008) data analyses indicate that the *Leader* level is dominated by commercial entities, most universities can be found in the *Follower* and *Leader* level and governmental entities and consumer groups mostly choose the *Spectator* level. However, all member levels are strongly dominated by vendors. In most cases membership fees are scaled, since *Leaders* usually pay higher shares. Thus they have more voting or veto power and are therefore able to strategically influence the standard setting process. In consequence membership levels often reflect the balance of member power (Updegrave, 2008). An even membership structure can only be found in 23.6% of the regarded consortia. The findings indicate that informal standard setting is in many cases strategically dominated by market power and revenue of commercial entities and vendors.

To illustrate the scope of involvement in standard setting among consortia, the business spectrum was classified in broad and narrow. Only 16.3% of the consortia follow a broad spectrum of standardization, which is comparable to structures in formal standard bodies. The often so called “one purpose consortia” usually follow only one standard or specification and their business can therefore be classified as narrow (83.7%). These findings are related to the low amount of members, as the correlation of data shows that most narrow consortia tend to have a lower amount of members. A possible assumption is that this leads to more effective and flexible decision making processes within consortia. Both attributes are distinct characteristics to differentiate consortia from formal standard bodies, since the latter mostly follow a broad business spectrum and tend to have a higher number of members.

The evaluation of the CEN survey provides information on the primary and secondary industry sector where a particular consortium is active in. These findings indicate a very heterogeneous picture of the consortia landscape. In order to better frame these results, data was aggregated to seven categories. Over a third of the consortia produce standards for the telecommunication industry (37.67%). E-Commerce (17.2%) and electronics (15.75%) also make up one third of the consortia target industry. Less ICT related industries such as advocacy, life-science, manufacturing and multi-industry summarize the last third of consortia target industries. These results are in line with most researchers’ assumptions, i.e. especially ICT industries rely on more flexible and quick standard solutions developed by informal consortia.

A very political and lately often discussed topic is the interplay of IPR and standards. In comparison to formal standard bodies, the IP policies of consortia are not always transparent and distinct in its paragraphs. Thus only 95 consortia could be classified appropriately. The findings show that 54.7% of the consortia follow a F/RAND (Fair Reasonable and Non-Discriminatory) policy, whereas 43.3% of the consortia use royalty free IPR regulations. To better assess these results, consortia were also classified in their technical classes. Figure 2 illustrates the IP Rules of consortia per technology. The graph shows that IP policies differ between technologies and it thus seems presumable that the technical topic determines the pursued IPR rules. The high number of royalty free consortia in software is on the one hand due to several open source consortia which can be found within this class and can on the other hand be explained by the fact that IPR on software is restricted in several countries. Explanations of other technological classes are not always obvious and have to be assessed on a lower level of aggregation, since IPR rules differ between specific products and companies involved. An in-depth analysis will though not be pursued in this paper.

### IP Policy in technical class (n=95)

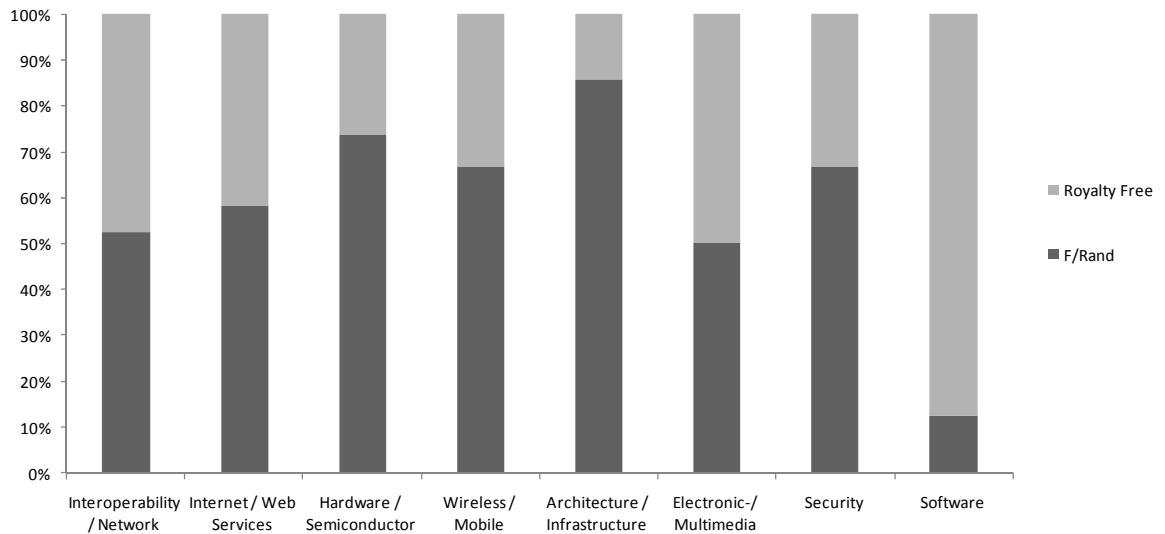


Fig2: IP policy statements of consortia per technical class

### 3.2 CONSORTIA DEVELOPMENT PHASES

There are several papers about the development of standardization with respect to the formation and evolution of informal consortia (Hawkins, 1999; Cargill 2002; Jakobs, 2003; Updegrave 2008). However, there is yet no comprehensive quantitative approach to examine the survival of informal consortia over time. Using the CEN survey editions between 1998 and 2009 the data assembles a current list of ICT consortia for every year and even twice a year in 2001 and 2006.

### Consortia Quantity (n= 435)

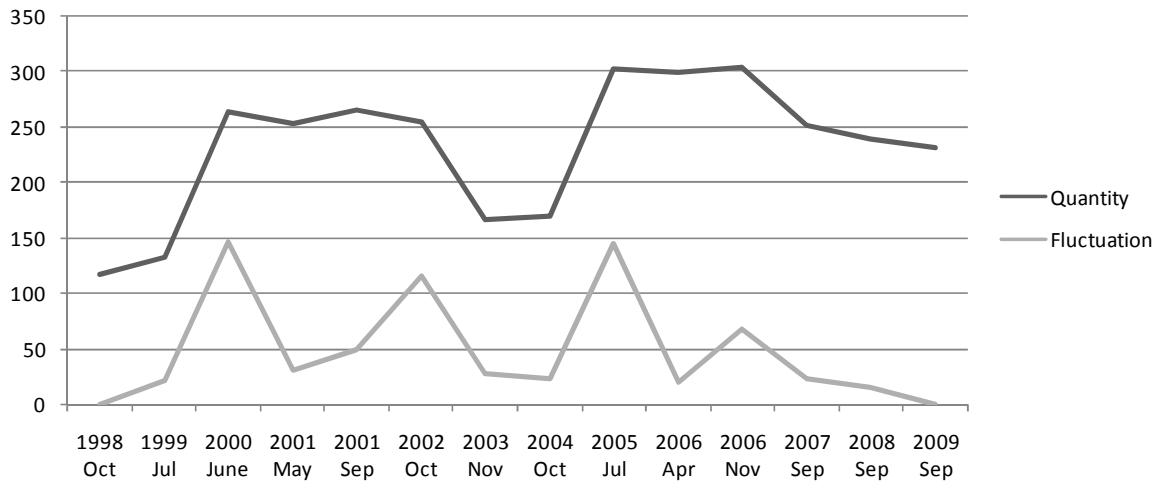


Fig3: Survival of informal ICT standards consortia 1998-2009

Figure 3 shows the quantity of consortia at the respective point of time, also indicating the fluctuation rate, which is the sum of new and terminating consortia. Figure 4 illustrates the consortia development assigned to the respective technology class.

Since the mid-1990ies the increasing formation of consortia can be explained by the rise of the internet market, where the first peak of development is in June 2000, counting 123 new consortia compared to July 1999. This period is characterized by strong standard battles (Microsoft Explorer vs. Netscape Navigator) and the rise of future influential consortia in the internet infrastructure such as the Internet Engineering Task Force (IETF) or the World Wide Web Consortium (W3C) (Cargill, 2002; Updegrave, 2008). Figure 4 shows that the class Internet / Web Services increased from a share of 14.47% in July 1999 to 20.16% in May 2001.

The next fluctuation peak can be found in 2002, where 107 consortia were terminated compared to May 2001. Taking a closer look at the technology class development, especially the percentage of Internet / Web Service consortia decreased from 20.44% in October 2002 to 16.67% in November 2003. Also Security and Wireless / Mobile decreased in their shares between 2-3%. A deeper look at the data also shows a consolidation process. Several consortia were not entirely terminated but merged with other consortia. The consortia amount remained stable in other technology classes and thus gained an increase of share.

Taking into account the burst of the “dot-com bubble” between 2000 and 2001 where the NASDAQ Composite had a historical decrease, these economic developments also led the consortia formation into a recession. The results are evidence for the close relation of market development and informal consortia formation. Thus the findings show how quickly informal standard setting activities are able to react to economic developments and changing market needs.

#### Development of Technical Class (n=351)

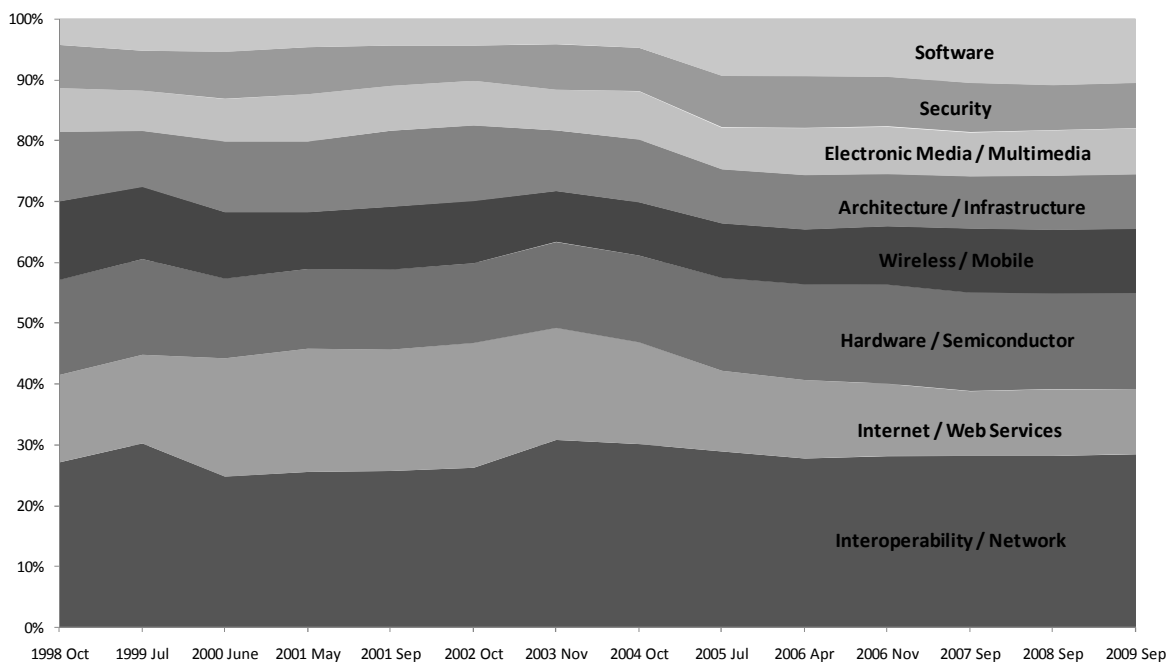


Fig4: Consortia technology development 1998-2009

A significant period of informal consortia formation started in 2005. Between October 2004 and July 2005 the CEN Survey data analysis identifies an amount of 133 new consortia. The technical class development shows that the share of software orientated consortia tripled within one year. This development was especially due to a new awareness of open standards in general and the rise of the open source consortia in particular. One third of the software consortia can be distinctly identified as open source projects. Except for Internet / Web Services a new formation of consortia in all technical classes has taken place. This gives evidence for an increasing broader appreciation of informal standard setting consortia.

Since the highest peak level in 2006, counting a quantity of 304 consortia, the formation of new consortia remained on a constantly low level in the years to come. In contrast between September 2006 and 2007 the second highest peak of consortia termination took place, as 50 consortia ended their business or merged with others. Again these finding can be linked to economic events, as the US subprime mortgage crises took place in 2007, which later triggered the worldwide financial crises in 2008. The findings are able to reflect the close connection of consortia development and industry performance. These findings again give evidence for the assumption that informal consortia formation is more flexible and dynamic and thus able to react immediately to ups and downs of market development.

#### **4. CONCLUSION AND RESEARCH OUTLOOK**

This paper aimed to give a broad overview of informal consortia, its characteristics and development in the past ten years. Even though empirical analysis is yet descriptive, results already introduced coherences in terms of the features and survival of consortia. Several attributes, show distinct characteristics and differences to differentiate the consortia phenomenon from other standard setting activities. By combining the assessed consortia information in this paper, several relationships and background coherences are revealed and thus deliver a more transparent picture of the informal consortia landscape. The stereotypical consortium could hence be described as having usually less than 100 members, following only one purpose of business, being hierarchical in its decision making structures and due to tiered membership fees, are often dominated by vendors and commercial entities. The stated IP policy is strongly connected to the produced technology. In contrast to formal standard bodies, consortia are very flexible and able to react on certain market developments. This either results in a formation as well as termination of businesses or mergers with other consortia. Involvement in informal standard setting enables members to gain quick and flexible participation to influence the standardization process. Especially solvent vendors and commercial entities can use their strong membership positions to strategically direct a certain standard or specification.

Further research is planned not only to describe stereotypical consortia and their survival, but also to find distinct empirical evidence to assess why consortia are successful and stable and how consortia features correlate with formation, termination, merger and continuity of consortia. Furthermore an analysis of participating organizations, using a time series assessment of membership to get further information on the internal development and evolution of consortia, is in prospect.

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