

# Standards development and diffusion : a case study of RosettaNet

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# **Strategies for Successful Standards Development and Diffusion: A Case Study of RosettaNet**

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## **INTRODUCTION**

Business-to-business (B2B) electronic commerce requires a set of standards that ensure system interoperability and integration of partner organizations. The need for common data and process standards to support inter-organizational integration has resulted in a proliferation of industry-sponsored Standards Consortia [5]. Not all Standards Consortia, however, have been successful in propagating standards for their industry.

Prior research has identified two key dimensions of a Standards Consortium's performance: the extent and speed of standards development and adoption [10]. Widespread standards adoption is critical, because B2B standards, like other network technologies, are susceptible to network externalities [3]. The attractiveness of the standard to potential adopters is dependent on the number of existing users. The speed of standards development and adoption reflects the Standards Consortia's responsiveness to the industry's increasing e-business requirements [10]. Achieving speed however, is difficult because of the need to involve user organizations across geographically dispersed regions and industries [7], and it is not an easy task to get a group of organizations with such heterogeneous interests and perspectives to work with one another [5].

Standards Consortia can adopt various strategies to ensure their success in both the standards development and adoption process. Prior research has shown Standards Consortia are

important in promoting standards adoption, but has not shown exactly how the actions of Standards Consortia are linked to standards adoption. Hence, our study contributes to the literature by examining what Standards Consortia can do to increase the likelihood of the Consortia success. An understanding of effective Standards Consortia strategies will provide important lessons for other Standards Consortia who are new or less established [7].

Standards Consortia activities fall broadly into two categories: *standards development* and *standards diffusion*. We identify, from prior research and theories, the different strategies that Standards Consortia can pursue in these two areas. We illustrate these strategies with the case of RosettaNet, a Standards Consortium for the high-technology industries.

## **ROSETTANET**

We use a case study approach to conduct an in-depth analysis of RosettaNet. RosettaNet has one of the biggest organizational membership among all the supply chain Standards Consortia [7]. As much of the high technology industries supply chain are in Asia, RosettaNet faces significant challenges in diffusing its standards across countries with widely varying infrastructure and business culture. Despite this, RosettaNet has been cited as a Standards Consortium with high potential for success [e.g. 4]. Examining RosettaNet's strategies may therefore generate useful lessons for other Standards Consortia.

RosettaNet is a not-for-profit organization that was founded in February 1998. RosettaNet quickly grew to a membership of more than 500 organizations. Today, RosettaNet is organized into six industry sectors. Each industry sector has its own council, comprising key industry players. In addition to Council members, there are four other types of Rosettanet memberships (see Table 1).

Insert Table 1 About Here

We collected data in two phases. In Phase 1, secondary data was obtained from RosettaNet's website about their standards development methodology and programs. In Phase 2, we conducted hour-long face-to-face meetings and phone interviews with thirteen informants, ensuring that interviewees included representatives from different roles and regions. We also attended several RosettaNet conferences and workshops that provided information on various initiatives.

## **STRATEGIES FOR THE STANDARDS DEVELOPMENT PROCESS**

### **Paradox of Participation**

A key aspect of Standards Consortia strategy for building a critical mass of adopters is to involve key players and a wide range of stakeholders in the relevant industries [5]. This increases the standard's legitimacy because it enhances the perception that standards were set with consideration of costs and impacts on all relevant stakeholder groups. Key players involved in the standards setting process, are usually also early adopters of the standard who demonstrate the value of standards adoption. The participants are also likely to have greater ownership of the standard, and to be advocates, pushing key suppliers and customers to adopt [10].

Unfortunately, there is an inherent paradox in the strategy of participation. The larger the number of stakeholders, the more difficult it is to achieve consensus [10]. Different players are likely to have different requirements, and priorities. This can slow the standards setting process [6]. There is therefore a tension between the need to involve a large number of stakeholders, and the need to move standards development at a fast pace [5]. The cost of delay needs to be weighed against the goal of creating a set of legitimate and high-quality standards that factor in the diversity of participants' viewpoints [9].

Successful Standards Consortia must have strategies for effectively managing this tension. The strategies should 1) promote a focus on solving real world business problems, 2) move the standards setting process along at a fast pace without negatively affecting the quality of the standards, and 3) ensure open sharing of valuable knowledge across a wide range of stakeholders [1, 5]. We next examine RosettaNet's strategies for meeting these objectives.

### **RosettaNet's Strategies for Standards Development**

The corner stone of the RosettaNet standard is the Partner Interface Processes (PIPs). PIPs specify the processes and associated business documents for data exchange between organizations. PIPs are developed via milestone programs. The milestone program has been carefully designed to meet the challenge of balancing stakeholder participation with speed of development.

**Significant Commitment of Resources to Milestone Program:** Only council members have voting privileges and can sponsor new PIP development. At least five council members and twenty trading partners must commit to implement the resultant PIPs before a milestone program can be approved. This requirement ensures that organizations will commit significant resources to PIP development. Hence, only standards that address real-world, high value business issues become milestone programs.

To assure the feasibility of the standards upon implementation, people responsible for PIPs implementation in their company (champions) are often assigned to participate in the program. Organizations also involve employees with different skills to work on different parts of the standards setting process. To ensure that their organization will obtain returns from their resource investments, participants involved tend to focus less on political aspects of the standards setting, and more on getting the standards implemented. RosettaNet's Vice-President of

standards management explained how the practical focus of milestone participants helps the consensus-building process: “Because of the need to get real benefits from the implementation process, people get pragmatic about how to solve the problem. They work very much like a project team in a company... Team members usually resolve their own problems; there are barely situations where something is escalated above the team.”

**Clear Roles and Restrictions:** Other council members do not get involved in developing the PIPs, only in voting to accept or reject the standard in the course of development. While this reduces the number of key players actively engaged in standard development, it also reduces the need to manage too many differing views, and speeds up the process. The director of a milestone program explained the rationale for reducing the number of active participants in the standards setting process: “You always need a hurdle mechanism, otherwise you get noise. It is very hard in a consortium to say no. It is better to set up hurdles and give people very clear requirements for moving forward. They can be self governing, but to gain voice, you need to commit to implement.”

**Requirement for Validation:** Some Standards Consortia only require the standards to be set and approved, while others require at least a couple of implementations as proof of concept, as in the case of IETF [9] and EbXML. RosettaNet’s validation process goes beyond proof of concept to full implementation of the PIPs with the Milestone Program participants who have committed to implementing the resultant PIPs. A feedback loop linking the validation experience to the standards development process helps to identify shortcomings of the specifications in a variety of organization contexts. This leads to a set of technically sound and usable standards. RosettaNet’s Vice President for standards management explained the importance of learning

from the validation experience: “It is very difficult to define everything about a set of PIPs in a conference room. The validation process brings the standard through the test of implementation.”

**Informal Norms and Social Networks:** Milestone programs bring together the champions from each company, and through their interactions, build and strengthen new and existing ties. The result is a strong social network that places a high premium on trust and reputation. Individuals within the network are motivated to self-regulate their behavior to focus on constructive problem solving and effective knowledge sharing. The Vice-President of standards management explained the importance of allowing these social mechanisms to work without interference from excessive rules: “People participating in RosettaNet are already very passionate about it; many of them believe they will make a difference and they can contribute. If we put in a lot of rules, they will leave, or they will wrestle against it.”

### **Trade-Offs in RosettaNet’s Standards Development Strategies**

All effective strategies require trade-offs [8]. Unlike other Standards Consortia, which permit public comments on draft versions of their standards [7], only a limited group of RosettaNet members are allowed to provide inputs into the standards development process. RosettaNet has adopted the strategy of implementing “hurdle mechanisms” to prevent everyone from having a say in the standards development process. Such strategies are effective in fulfilling the objectives of: (1) Focusing on solving real-world problems, and (2) Moving standards setting at a fast pace without negatively affecting the quality, but fall short of the objective of open sharing of knowledge across a large group of stakeholders. To mitigate the restrictions, however, RosettaNet endeavors to ensure a representative group of participating companies in the milestone program, by including companies of varying size and regions.

Figure 1 presents an overview of RosettaNet's standards development strategy, its potential influence on adoption, and moderating effects of the standards development strategies.

Insert Figure 1 About Here

## **STRATEGIES FOR THE STANDARDS DIFFUSION PROCESS**

### **The Paradox of Global Standards Diffusion**

Successful organizations have strategies that are internally consistent to deliver on its value proposition [8]. A Standards Consortium's diffusion strategies need to be aligned with its standards development strategies. The strategic choices made by the Standards Consortia with regard to the participation paradox in standards development have implications for the subsequent diffusion of the standard. In the case of RosettaNet, we observed that the diffusion strategies took into account the restrictions in standards development participation, as there is significant investment of resources in diffusion so that adoption spread widely beyond those organizations involved in standards development [9]. The diffusion strategies also reflected the fact that a large proportion of the supply chain (i.e. potential adopters) in high-technology industries is in Asia.

The RosettaNet case surfaces a second paradox. Successful Standards Consortia provide value by enforcing common data and processes among supply chain partners. However, when Standards Consortia seek to diffuse their standards globally, business partners often operate across countries with diverse economic, regulatory and social environments. Effective Standards Consortia must therefore have diffusion strategies that effectively balance 1) the need for a coordinated approach to diffuse the standards globally with 2) flexible adaptations of the standards diffusion strategy to the local conditions in order to ensure speedy adoption.

## **RosettaNet's Decentralized Approach for Standards Diffusion**

RosettaNet adopts a decentralized approach for promoting standards diffusion.

RosettaNet has its headquarters (HQ) in the United States (known as RosettaNet Global).

RosettaNet has also appointed Vice Presidents to spearhead standards diffusion in Asia and Europe. In the Asia-Pacific region, RosettaNet has established affiliate offices in Japan, Taiwan, China, Malaysia, Philippines, Singapore, Thailand, Korea and Australia. RosettaNet depend on its affiliate offices in various countries to generate local strategies to promote within-country diffusion, after PIPs development are completed. The Asia-Pacific Vice President coordinates the standards diffusion efforts of all the affiliate offices in Asia. In Europe, RosettaNet has been slower in gaining acceptance, as electronic data interchange (EDI) has been deeply rooted as the standard for information exchange. Hence, RosettaNet has yet to set up any affiliate country offices in Europe.

Each RosettaNet affiliate office is run independently, and obtains its own funding to sustain its operations. Each RosettaNet affiliate also attracts and retains its own members. Nevertheless, all RosettaNet affiliates have the same mandate of promoting the diffusion of RosettaNet PIPs among its members. As RosettaNet Global Council members tend to have global operations, the local staff of Global Council members (e.g. Malaysian Staff from Intel) often play a major role in helping affiliate offices organize activities, and even attract new members, who typically make up RosettaNet's Regional Partners.

## **RosettaNet's Diffusion Strategy**

The portfolio of strategies used, can be broadly classified into four key categories: market, technology and policy [2] as well as relational strategies:

- (1) **Market Strategy** promotes awareness among potential adopters of the standards' capabilities and benefits, and how the standards can be implemented in their organizations.
- (2) **Technology Strategy** improves the standard's technical performance, by lowering the cost of implementation, and increasing the ease of implementation and use [2].
- (3) **Policy Strategy** changes or leverages the social and legal-regulatory environment in which the potential adopters operate.
- (4) **Relational Strategy** refers to co-opting key players, such as industry supply chain masters, to apply pressure on their trading partners to adopt the standard.

We observe the four strategies implemented in distinct ways across countries, as RosettaNet adopts a "One Size doesn't Fit All" philosophy (RosettaNet Director for Marketing). At the same time, RosettaNet also needs to maintain a certain degree of consistency in the positioning and communications of its standards.

**Market Strategies:** RosettaNet Global coordinates the development of marketing and educational material for distribution to country affiliates to ensure consistency of message about the standard. Affiliates also produce their own marketing and educational material to showcase local companies' implementations of RosettaNet or explain how RosettaNet can be used in conjunction with local government's e-business plans. RosettaNet local affiliates also frequently organize conferences and workshops to increase awareness of RosettaNet capabilities. These conferences not only feature RosettaNet Global staff who provide updates on new global initiatives, but also showcase the RosettaNet implementation efforts of companies in the region.

**Technology Strategies:** RosettaNet Global engages in R&D to increase ease of implementation and usability. For example, a recent program called the "RosettaNet Automated

Enablement” (RAE) is targeted at increasing the usability of RosettaNet for small and medium businesses (SMBs).<sup>1</sup>

RosettaNet affiliates in countries having large numbers of SMBs with less technological maturity are likely to pursue country-level technology strategies. For example, RosettaNet China worked with local application service providers (ASPs) to provide affordable and quick connect e-hub solutions. However, RosettaNet needs to ensure that affiliates do not create local variations of the standards, thus undermining RosettaNet’s global standardization effort. RosettaNet manages this by using “Focus Process Teams” (FPT) for each milestone program. Companies from different regions are invited into the FPT for each milestone program to examine if there is a need to factor any region-specific requirements into the PIPs. Milestone programs also endeavor to include companies in different regions as participants in the validation phase to ensure that the PIPs meet region-specific requirements.

**Policy Strategies:** RosettaNet Global takes note of major changes in policy that affect entire regions, and seeks to develop appropriate standards. For example, RosettaNet is working with industry associations to understand the regulatory requirements of the Green Law<sup>2</sup> by the European Union, and to develop new PIPs to satisfy these requirements.

In Asia, affiliates have actively pursued country-level policy strategies. Asia lacks a unifying body such as the European Union, and governments play a major role in each economy, developing infrastructure and investments in strategic sectors. One common policy strategy is to gain endorsement from the country’s government. This provides significant legitimacy for the standard and boosts the confidence of potential adopters. One clear signal of endorsement is to

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<sup>1</sup> With RAE, SMBs can use Adobe forms to automatically translate data into RosettaNet XML schemas, to communicate with trading partners.

<sup>2</sup> The Green Law requires all suppliers in the electrical and electronic equipment industry to report the hazardous materials composition in their goods. This raises new data requirements for the supply chain.

have senior government officials assume leadership positions in RosettaNet (such as in China and Singapore). Endorsement can also take the form of adopting RosettaNet as a recommended standard in the country's e-business plans (as in Taiwan). More directly, Philippine and Malaysian governments are using RosettaNet PIPs for their electronic customs declaration system.

Another key policy strategy is to obtain funding and personnel from the government. For example, in countries such as Singapore, Malaysia and Taiwan, governments provide grants for SMBs or even MNCs to subsidize the cost of their RosettaNet implementation. These grants are targeted at catalyzing the adoption of RosettaNet, and helping standards adoption to reach a critical mass in the industry. RosettaNet also sometimes obtains government funding for affiliate offices or local research centers.

**Relational Strategies:** Globally, RosettaNet capitalizes on supply chain masters actively participating in RosettaNet to influence and work with their trading partners to realize the business values of adopting RosettaNet. RosettaNet's relational strategy is so pervasive that in one company representative's opinion, 80% of the connections between trading partners using RosettaNet is effectively driven by a group of powerful supply-chain masters.

Within Asia, at the local country level, relational strategies play a less important role. The lower effectiveness of the relational strategy in Asia may be attributed to the lack of large supply chain masters, with sufficient clout to influence many trading partners (except in Japan and Taiwan). MNC subsidiaries in Asian countries also lack driving initiatives and decision powers as many view themselves as only a subsidiary or manufacturing site of the U.S. or European company.

## **Trade-Offs in RosettaNet's Standards Diffusion Strategies**

RosettaNet's diffusion strategies have been effective in accelerating the extent and speed of standards adoption beyond the U.S., particularly in countries where RosettaNet has affiliate offices. The decentralized focus of standards diffusion strategies complements RosettaNet's standards development strategies, resulting in a high level of standards adoption despite a less inclusive standards development approach. The trade-offs are a greater need for coordination by RosettaNet and the need to manage the risks of excessive local adaptation. Figure 2 provides an overview of the main types of diffusion strategies that Standards Consortia pursue.

Insert Figure 2 About Here

## **CONCLUSION**

RosettaNet offers an example of a Standards Consortium that has been relatively successful in achieving both speed and extent of standards development and adoption. Since its founding in 1998, RosettaNet has published 110 sets of PIPs. They have declared in May 2003 that they have reached critical mass in the high technology sector [7]. What lessons from Rosettanet's development and diffusion strategies are applicable to less established Standards Consortia?

First, Standards Consortia standards diffusion strategies must complement their standards development strategies. RosettaNet chooses to provide a voice only to those organizations that are committed to solving the targeted problem. This strategy leads to a focused, quick, and problem-oriented approach to standards setting, at the expense of a more inclusive and open approach typical of many other Standards Consortia [7]. This is somewhat mitigated by the inclusion of a representative group of companies in standards development. RosettaNet ensures broad adoption beyond these standards setting participants by investing significantly on standards diffusion

strategies through country affiliate offices. Hence, contrary to previous studies that have advocated the need for openness for standards setting, it appears that there is no one right approach for the standards development process. Standards Consortia, do however, need to ensure that they adopt standards diffusion strategies that are aligned with their standards development processes.

Second, RosettaNet's experience shows the importance of adapting each standards diffusion strategy to the local conditions in each country. While we have identified a set of strategies that Standards Consortia can use to promote standards diffusion, including market, technology, policy and relational strategies, these strategies should be adapted to local conditions in the country. The challenge is to balance central directions from the HQ with local adaptation.

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