

# TIPPING THE BALANCE

## *Drivers and Barriers for Participation in a Knowledge Sharing and Collaboration Community*

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**Abstract:** In this paper we report our efforts to elicit an understanding of drivers and barriers for participation in a Web2.0 online community platform to support the unique collection of virtual collaboration requirements inherent in inter-organization, cross-cultural, and cross-discipline team environments that comprise the Atlantis community. Atlantis is a grant program to stimulate and fund the organization of dual degree master programs between consortia of European and American Universities. The key challenge in this project is neither the analysis nor construction of the online community platform (though neither is in itself a trivial task), but rather the question of how to encourage use of such a platform, and its evolution into a self-sustaining community. We report our findings from a workshop, interviews and a survey to gain understanding in the drivers and barriers of participation. The drivers and barriers are then presented as a design framework for an online learning community.

## 1 INTRODUCTION

Development of intra-organizational knowledge management systems is well established and researched. However, the development of inter-organizational knowledge management systems is less well understood especially in global cross-organizational, cross-discipline, and cross-cultural contexts where multi-cultural boundaries and barriers potentially inhibit knowledge creation and sharing. Enterprise social networks are emerging as a legitimate organizational knowledge sharing tool in 2008 and 2009. These networks, far beyond the informal networks such as FaceBook and MySpace

(Parameswaran, 2007), seem to be finding a legitimate role in both private industry and governmental institutions as a platform for intra-organizational knowledge sharing. While many barriers and caveats exist, limiting adoption at this point, industry research suggests they will now become accepted and mainstream (Drakos, 2006). Web 2.0 virtual teaming environments are following a similar adoption pattern. Dozens of virtual teaming products exist, and over 100 open source groupware packages are available for implementation (Mittleman et al., 2008). Social software is software that aims to simplify the realization and preservation of networks among people, and has become a part of organizational life. However, most knowledge

workers have limited idea of what colleagues are working on or what they know about and only have limited time for knowledge exchange. This is caused by geographical distance, structural boundaries (Ardichvilli, Page and Wentling, 2003), and a knowledge hoarding culture. Less research has been performed on the uses of such platforms to share knowledge in the form of lessons learned in diverse global settings. In this project we developed an overview of requirements for cross culture, cross discipline and cross organization knowledge sharing.

Atlantis is a grant program to stimulate and fund the organization of dual degree master programs between consortia of European and American Universities. The Atlantis program is coordinating over eighty university consortia involving institutions from the US and European Union nations. Programs range over a variety academic disciplines. While each consortia learns many valuable educational curricula and administration lessons over the three year life of their grants, and undoubtedly significant strong work practices are discovered, no official effective mechanism exists (aside from an annual conference and reporting) to capture these lessons learned and communicate best practices with other consortia and to future Atlantis Projects, or to the International Education community in general.

In this paper we report our efforts to elicit requirements for a Web2.0 online community platform optimized to support the unique collection of virtual collaboration requirements inherent in inter-organization, cross-cultural, and cross-discipline team environments that comprise the Atlantis community. The key challenge in this project is neither the analysis nor construction of the online community platform (though neither is in itself a trivial task), but rather the question of how to encourage use of such a platform, and its evolution into a self-sustaining community. This is a complex socio-technical problem difficult enough within a single organization, and even more complex as an inter-organization, cross-cultural, and cross-discipline community of collaborators. Atlantis projects comprise multiple intersecting professional, organizational and national cultures. Significant communication gaps can occur that inhibit knowledge sharing and collaboration and must be identified and accommodated in both the design and evaluation of the project. If such gaps are not addressed the project will not sustain long term usage and adoption.

The development of the platform for cross team, cross culture collaboration involves three key

challenges:

- Challenge of incentives/participation
- Challenge of integration, creating value
- Challenge of identifying and bridging cultural communication gaps

This is a complex socio-technical problem difficult enough within a single organization and even more complex as an inter-organization, cross-discipline, and cross culture community of collaborators. Atlantis projects comprise multiple intersecting professional, organizational and national cultures (Schneider and Barsoux Jean-Louis, 1997; Straub et al., 2002). The paper reports on a set of interviews a workshop, and a survey to understand the drivers and barriers of the participants of these consortia, to participate in a platform that will support their cross team collaboration to exchange lessons learned. We will first describe some background on sharing best practices. Next we will discuss the challenges from a literature perspective. Third we will describe our effort to gather input from team members to inform the drivers and barriers of participation, and finally we will report a framework of these drivers and barriers to inform the design of the online community.

## 2 BACKGROUND

In order to share best practices across teams and cultures, it is critical to ensure clarity, usability and relevance of the information shared (Warkentin and Beranek, 1999). To ensure these qualities of the knowledge shared we will use a framework to encourage users to share enough detail with respect to best practices and lessons learned to ensure that these can be understood and put to use in other consortia. A useful framework for the sharing of best practices that has proven valuable in a number of domains is the use of design patterns. Design patterns were first described in the domain of architecture by Christopher Alexander (1979) as reusable solutions to address frequently occurring problems. In Alexander's words: "a [design] pattern describes a problem which occurs over and over again and then describes the core of the solution to that problem, in such a way that you can use this solution a million times over, without ever doing it the same way twice" (Alexander, 1979).

After design patterns were applied to software engineering (Gamma et al., 1995), the concept of design patterns to share best practices made its way

in a variety of domains including collaboration support. For example, Lukosch and Schümmer (2006) proposed a pattern language for the development of collaborative software. Design patterns are successfully used in related fields such as communication software (Rising, 2001), e-learning (Niegemann and Domagk, 2005), facilitation of collaboration processes (Vreede, Briggs and Kolfshoten, 2006), and for knowledge management (May and Taylor, 2003).

Design patterns are thus reusable, formalized lessons learned and best practices, documented to make them easy to transfer to others. The documentation framework for design patterns ensures that practical solutions are shared with sufficient context so others can judge when to apply them and will understand how to apply them. The design patterns based on best practices create a short-cut in the learning cycle in which the user community learns from the evaluation of changes to improve learning between the consortia. Atlantis consortia usually exist of teachers, curriculum developers, education program directors, and education administrators. Often, the consortia build their curricula based on existing courses. Often students from different universities have, while working in the same domain, different backgrounds as the focus of their curriculum will differ in each university.

Another key part of the collaboration involves the coordination and synchronization of the education administration at the different universities involved. This requires setting agreements on e.g. study credits, the degree and accreditation. Finally a key challenge is to support students in studying abroad, and collaborating with international peers.

While students are legally self-responsible, the universities involved bear responsibility for supporting the students in e.g. finding accommodation, getting appropriate guidance and adapting to different international cultures. For all these matters the consortia had to find solutions; education wise, administrative, legally, and especially practically. The utility of this approach to the Atlantis community is the surfacing, capturing, and transfer to the community at large of best practices that emerged at the different Atlantis consortia.

Summarizing, creating a self-sustaining, valuable platform for knowledge sharing is not a straight forward task. Based on figure 1 and our experience we have identified three key sources of challenges that play an important role in the success of the platform:

- Challenges of participation, concerning the

motivation and incentives people feel with respect to adopting a new system and participating in a new work practice.

- Challenges of integration, creating value, concerning how people perceive the value of the information shared between teams, and the value of the new system and work practice.
- Challenges of identifying and bridging cultural communication gaps, concerning the differences of interpretation of communication and behavior due to different sets of meaning among participants.

Several authors have worked on challenges concerning the adoption of new IT by users, such as (Davis, 1989; Venkatesh, 2003; Venkatesh and Davis, 2000). We analyzed the key sources of challenges above based on this literature, describing each in more detail.

## 2.1 Challenges of Creating Value

To understand the challenge of creating value we used the value frequency model developed by Briggs (2006). This model builds on e.g. the Technology Acceptance Model by Davis (1986), but has been developed in the domain of collaborative work. The value frequency model predicts change of practice and adoption of a new work practice with associated technology. The model posits that the key factors relevant to adoption are the perceived net value of the new work practice, in this case, the value of lessons learned and best practices of other consortia, but also value from participation and visibility in the community can be part of this. This value is then multiplied by the frequency in which this value is derived, e.g. if lessons learned are only shared once, the value of participation will be limited, where this will increase when lessons are shared on a regular basis.

## 2.2 Challenges of Participation

Besides value and the frequency in which this value occurs, the model posits that it is important that participants have some certainty that they will derive this value. In this case it is important that stakeholder's commit to share their lessons learned, and can trust that others will do the same, as the key value for participation is the content shared by other participants. This phenomenon is a core principle in effective collaboration (Kolfshoten et al., 2010). Finally an important factor is the transition costs, here understood as the costs of learning to use the

system and the methods around the sharing of best practices. This is resolved by paying attention to ease of use, and intuitive user interfaces. The value frequency model is depicted in figure 2.

### 2.3 Cross Cultural Challenges

Cross Cultural challenges are not only a cause of different national cultures involved, but also include organizational and professional cultures. Researchers have been trying to identify how deep culture influences IT adoption by people (Leidner, 2006; Livari, 2002; Walsh, 2009); (Iivari, 2005; Leidner and Kayworth, 2006; Walsh, 2009). We assume that there is a possibility to further understand the cultural influence in the behavioral intentions as proposed in the Briggs et al. value frequency model (2006). The Consortia in the Atlantis project create an interactional evolution of different organizational and professional cultures involved (i.e. (Schneider and Barsoux Jean-Louis 1997; Straub, Loch, Evaristo, Karahanna and Srite, 2002). To collaborate between consortia, thus means to collaborate with a mix of unpredictable cultures, requiring high flexibility among participants. A key challenge will be to identify which of the cultures involved will affect adoption of IT, and how cultural challenges will change in online knowledge exchange.

Typical cultural difference that could have impact on adoption are described in the frameworks of Trompenaars and Hofstede (Hofstede, 1991; Trompenaars and Turner, 1998). Examples are masculine competition oriented culture (US) vs

feminine modest and caring (Scandinavia, part of Western Europe). Another key difference is universal vs particular rule based system, where in US rules are rather strictly applied, versus southern European cultures where rules apply depending on circumstances. A third cultural difference is in the display of affection. Besides country based cultural difference, professional cultures of universities can also highly differ; some universities are more hierarchical in their management structure, and another difference is the attribution of status, based on achievement versus position. These cultural differences can have an impact on how the platform and the associated work practice are perceived.

### 3 ELICITING DRIVERS FOR AND BARRIERS TO PARTICIPATION

To understand the drivers for and barriers to participation, and the creation of a successful collaboration platform we wanted to elicit feedback from the actual future users of the platform. For this purpose we carried out 21 semi-structured interviews with people participating to the Annual Conference for the Atlantis Consortia to interview participants. We have also run a workshop in which we asked consortia participants to brainstorm about sharing lessons learned with other consortia through a platform, and we ran a survey among future participants.

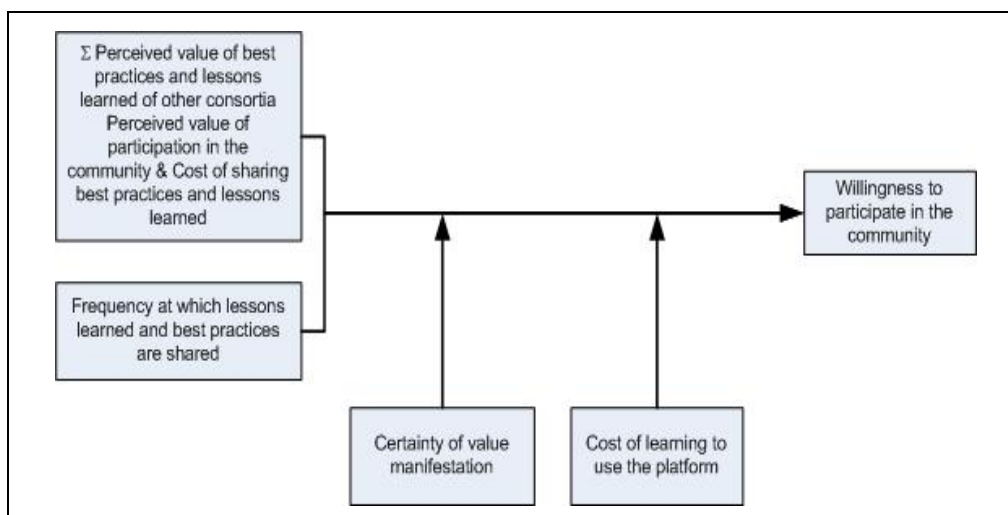


Figure 1: The Value Frequency Model (Briggs 2006).

Semi-structured interviews were carried out individually or in small groups of people participating to the same consortium. 21 interviews were performed. To structure and compare the interviews we used an interview protocol with the following questions:

- How often do you communicate with the other partners of the consortium?
- How do you communicate? What medium?
- What kind of information do you share?
- What do you know now that you wish you knew at the beginning of your project?
- What would you like to learn from other consortia?
- What would an online platform to exchange lessons learned among consortia in the Atlantis program look like?

Summarizing, we can say that participants are interested in others' experience, narrative stories, best practices and solutions and sharing experiences across cultures.

The main difficulties identified by participants were lack of homogeneity of administrative documents and cultural differences in dealing with administrative requirements (e.g. administration of funding, contacting, and student administration)

The interviews also offered information concerning tools currently used by the consortia as well as expectations towards technology to be provided which is really important for the consideration of value frequency model analysis. Current tool use is e-mail (90%), skype (43%), and file sharing (29%) more complex tools such as video conferencing (10%) and facebook (5%) were less used.

Participants' expectations towards a new technology varied. Some functionalities were suggested such as discussion forums (overall mentioned in 7 interviews), websites (3 interviews), on line repositories and databases (2 interviews), chat, newsletters and assessment tools. Further, participants mentioned that an important reason for them to switch to a new virtual collaboration environment would be the level of novelty and interest this new technology would bring such as the following verbatim can confirm:

- "make it enjoyable" (interviewee n°9)
- "make it easy to use"(interviewee n°14)
- "Please, surprise us"(interviewee n°10)

A barrier that we found in the interviews is the

controlling role of the government administrations. Participants in the consortia would appreciate an independent system, not controlled by the government. Further, personalization was an important issue mentioned. The main outcomes of the interviews were also confirmed during the workshop. The questions addressed in this workshop were the following:

- What would you like to learn from other consortia?
- What do you have to share, what can you teach others?
- What barriers do you see for sharing information across consortia using an online platform?

36 people participated:

- 50% used skype
- 20 % used googledocs

From this workshop we learned that the consortia would like to learn information from other consortia on different aspects such as curriculum innovation and teaching material, innovative pedagogy, lessons on project and grand administration, MOU development, student recruitment and preparation, cultural differences and consistency in grading and evaluation.

The information people had to share was somewhat different. While some of the information requested was also offered, in this brainstorm more soft, tacit experience information was mentioned, such as how to make collaboration in the consortium work, how to prepare students for the program, and in general experiences and insights in collaborating in the consortia. The difference between these is striking, and could indicate that on several practical issues consortia still struggle, and that they are not highly confident in the solutions they found so far.

The barriers identified in the process of sharing information were e.g. competition funding, no demand/request to share, no time, too much information, difference in discipline/domain, structure/organization, use data for research, usability of the platform and training, intellectual property, no funding for communication, fear of official control, status of consortium and leaders at home

## 4 SURVEY RESULTS

Based on the interviews and the workshop we got first ideas on the content of the platform, and the

barriers to use that need to be overcome. To further understand the willingness to adopt and use the platform, we designed a survey based on the Value Frequency model, described above. For this we identified eleven potential values of the system, based on the interviews and workshop. These are listed in table 3. We did not yet focus on frequency, certainty or transition costs as this would be difficult to estimate without a prototype or system description. We did measure perception of value (agree –disagree, 5pt scale) and magnitude of value, (importance, 5pt scale). We received 53 useable responses, not all were complete. The results are listed in table 1.

The results show that the key expected value from participation is visibility, support in administration, ‘networking’; leads to new projects or research opportunities, helps to acquire future

grants and helps to share/improve teaching. Least expected value was that it would help in achieving promotion in the workplace, and that it would save time in reporting. The values that were confirmed were also considered important. However, in addition it would be important that the platform is a valuable use of time.

The results seem to indicate thus that participants see some value of participation, but also expect it to take time, and are not certain that the cost-benefit balance will tip positive. This will become a key obstacle for the design of the platform, as a ‘proof of value’ will be required to convince users to participate. Also, the expectation of using the results (for publication and to ease reporting) is limited. This indicates that participants expect content to be interesting, but not necessarily useful.

Table 1: Values related to participation in the online community.

Value	Confirmation	Importance
Increase the visibility of my work within the study abroad community	4,0	3,7
Help me achieve promotion in my workplace	2,6	2,6
Save me time/effort in compiling my annual Atlantis report	3,1	3,5
Provide me with valuable insight to improve administration of my Atlantis project	3,8	4,1
Increase the likelihood of me receiving a future Atlantis grant	3,7	3,8
Would be a valuable use of my time	3,6	3,9
Increase the probability I will be able to publish research from my Atlantis project	3,3	3,3
Help me find new study abroad project or research opportunities	3,8	3,8
Help me share or refine teaching/curriculum techniques	3,7	3,8

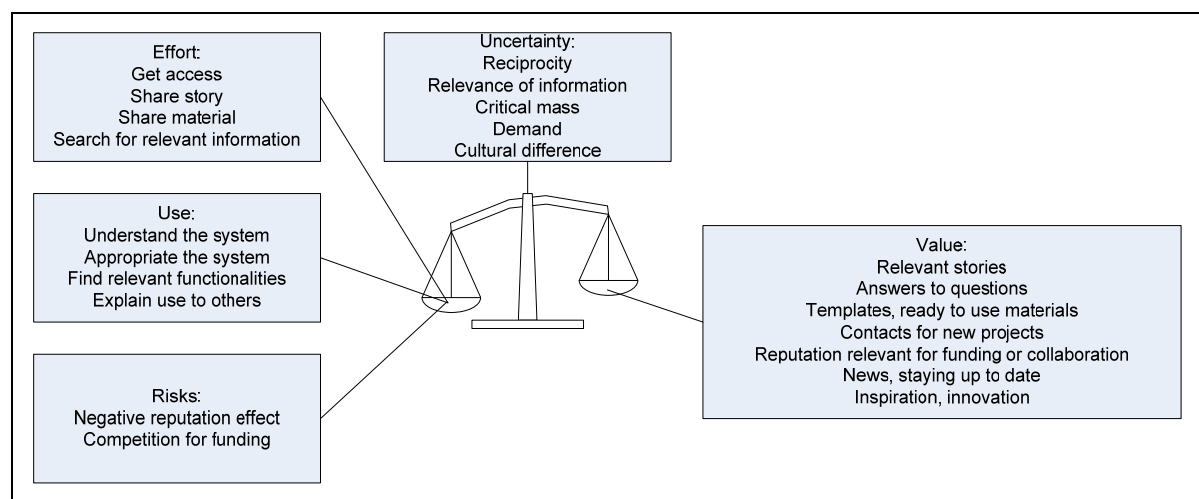


Figure 2: Balancing values in participation in online knowledge sharing communities.

## 5 DESIGN FRAMEWORK OF DRIVERS AND BARRIERS FOR PARTICIPATION

To create an overview of the cost-benefit analysis of participants we used the metaphor of a scale (see Figure 3.) To tip the balance we need to create a value that outweighs the effort, cost of use and risks, and that offers sufficient certainty of value.

The first negative balance is the effort and time required of participants to contribute to the community is to get access online to the platform (to sign up, create a profile, etc.); (Garfield, 2006), to share stories, to share materials and to search for relevant information.

Next, a barrier can be difficulty to use the platform. To use the platform, participants need to understand the system, they need to appropriate it and they need to find the relevant functionalities. Further, they might need to spend effort to explain use of the system to their partners in the consortium.

Also negatively tipping the balance are the risks of using the platform. These consist of the risk of negative reputation (Pearson, 2007). both with academic peers and with the funding authorities, next, a risk is that sharing knowledge and experience could help the competition in obtaining funding.

On top of the scale are the uncertainties regarding the platform. We put these on top of the scale as they can work both positive and negative. The first is reciprocity. When participants don't get something in return for sharing knowledge, they will consider it a waste of effort, while if they do get reputation or value in return, it will further increase value of participation. This system is important in social software and should be designed well (Preece and Maloney-Krichmar, 2003). The same goes for relevance. Uncertainty of relevance can have a negative impact, but when some indication of relevance is present, it will trigger curiosity. Third, there is uncertainty of a critical mass, when there are too few contributors, the community will not be lively. Next, there might be some uncertainty of a demand for certain information; it would help if there are specific requests for certain information. Finally, cultural difference could pose uncertainty of value. One key cultural difference between American and western European cultures is the level of competition: masculine vs feminine culture (Hofstede, 1991). This could strengthen the perception of the competition risk, which could pose a barrier to sharing.

The value of the platform consists of relevant

stories that participants can learn from, answers to questions, templates and ready to use materials, and contacts for new projects. Further, being active on the platform can help one to build a reputation, both with peers and with the funding authorities. Finally, the platform can offer news and help to bring inspiration and trigger innovation in teaching and learning methods.

## 6 CONCLUSIONS AND FUTURE WORK

This paper presents a design framework for an online community for the exchange of lessons learned in cross organizational, cross culture collaboration. The community we studied consists of many cultures, a variety of consortia and universities with loose links. The participants all have different academic backgrounds, and with different roles in the consortia. Participants from different consortia often don't know each other, and have limited opportunities to learn from each other except for a yearly conference. The framework presents drivers and barriers, but also a category of uncertainties that could become both drivers and barriers when first experiences with the platform are obtained. This set of uncertainties poses an interesting set of mechanisms that could help to tip the balance of willingness to participate in both ways. It indicates the need for initial content and a first critical mass, but also the need to create demand, to challenge people to contribute. We also learned that the positioning of the platform is critical. To reduce barriers to contribute, it should have an informal and unofficial status. We did not yet find the lever to tip the balance; while usefulness is acknowledge, getting people to start sharing their stories, without a first basis of relations and direct incentive, seems difficult. Ideally, a first set of stories is shared face to face, and then captured in the system, or alternatively rule based incentives from the funding authorities. There is also a cultural conflict in this; some cultures have rules and social pressure as an incentive for participation, while others need to develop some level of relationship and trust in order to feel an incentive to participate.

We will use the framework and the findings to design a platform for the exchange of lessons learned among Atlantis consortia and we will run a case study on the implementation of this platform and its adoption. Further research is required to further understand the impact of cultural differences.

This project will give us further insight in the mechanism's behind adoption and sustained use of the platform and there with the drivers and barriers to successful knowledge sharing communities.

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