Abstract: With increasing globalization, organizations have to cope with the management of knowledge in geographically distributed environments. In such a distributed setting, collaboration is challenging because of the geographic distance and different time zones, but also because of cultural distances between team members. This research provides valuable insights into the knowledge sharing and collaboration of Communities of Practice in an internationally distributed environment. The goal of this research is twofold. First, it analyzes the challenges in setting up and running such a community in its early stages of development. Secondly, it investigates how existing leading community management practices can be applied to overcome these challenges in order to support knowledge sharing and practitioners’ engagement. The approach undergone in this study was canonical action research, conducted over a seven months period in an online Program Management Community of Practice set up of a global consultancy organization. This community was recently set up and the organization’s intention was to take the community to the next stage of its development by increasing participation and engagement. The research set up entailed that the main researcher actively took part in further developing this community by studying the situation at hand, interviewing stakeholders and reviewing related literature. Based on these techniques, the researcher and the organization decided on the most suitable set of interventions that would deliver the desired results. The researcher critically reflected on these interventions as well as on their outcome. Results show that the most important challenges experienced by practitioners are the motivation to use the community as a knowledge source - as an alternative to personal networks and external sources, the time that needs to be invested and the means of interaction between members. During the process of implementing the selected interventions, the community evolved towards the next stage in its development cycle and the statistics regarding participation in the online community registered upward trends. The main contribution of this research is that, compared to previous studies, it provides a deeper understanding on setting up and managing distributed communities of practice. Furthermore, the study presents a systematic approach on how to improve knowledge sharing in a geographically dispersed community in its early stages of development. The main limitation of this study is the restricted degree of generalization that can be applied to the results, which is a direct consequence of the explorative nature of this research. Another limitation is the relatively short time span of the research process, which meant that not all the effects generated by the interventions could be considered in the results.

Keywords: Communities of Practice, Knowledge Management, geographical dispersion

1. Introduction

In the light of increasing complexity of business structures and relationships, Communities of Practice (CoPs) have become a hot topic in the 1990s, as they offered an innovative perspective on Knowledge Management (Duguid and Brown, 1991; Lave and Wenger, 1991). Since then, CoPs have received increasing attention from both literature and practice (Roberts, 2006). Wenger, McDermott and Snyder (2002, p. 115) define “distributed communities” as CoPs that exist across different time zones, business units and countries. Grootveld and Helms (2008) provide a framework, based on literature research, of the factors that might potentially lead to failure of such CoPs. Wenger, McDermott and Snyder (2002) mention a number of key issues that challenge the management of knowledge across the geographically dispersed business units, as well as the importance of achieving strategic alignment and technology consistency in this kind of communities. The issues identified are mainly related to the particular setting of a community, like the impact of distance and size on collaboration and knowledge sharing. With respect to this, Roberts (2006) expresses the need for future research to differentiate between CoPs in terms of size and space reach, as some of their features may be sensitive to their scale and geographical spread. Dubé, Bourhis and Jacob (2006) discuss about CoPs in global organizations, which usually - without excluding the face-to-face
element rely primarily on ICT to connect their members. The authors call this structure a Virtual CoP (VCoP), criticizing the existing “one-size-fits-all” advice for managing VCoPs and proposing a perspective which takes into consideration the structural characteristics that make them different from each other. Furthermore, Chanal and Kimble (2010) also emphasize the difference between self-organized and cultivated (managed) CoPs, suggesting that there is a need for more research on how to maintain the necessary level of energy for a community to succeed and to provide the promised benefits. In this context, one of the risks of managed CoPs would be that they decline and die because there is not enough participation to build and sustain an on-going practice (Chanal and Kimble, 2010).

The more recent literature (Verburg and Andriessen, 2011) recognizes that different types of CoPs require different technological and organizational support and that there is a need to better understand how to facilitate CoPs in different contexts. The specific question addressed in this paper is how current guidelines and leading practices on managing CoPs can be translated to the context of geographically dispersed intra-organizational CoPs, as intentionally cultivated groups. This question is answered by conducting an action research to analyze how existing models and theories can be fitted to the specific needs of such a community. The action research was conducted over a seven months period in an online Program Management Community of Practice set up for practitioners in the Europe, Middle East, India and Africa (EMEIA) area at Ernst & Young. At the moment of the research, the community was in its coalescing stage – a stage in which the community is officially launched and is starting to develop (Wenger, McDermott and Snyder, 2002).

The importance of addressing these gaps in the body of science lies in the fact that CoPs provide an essential environment for exchanging experience and best practices across national boundaries. This paper aims to broaden the Knowledge Management body of research by providing a systematic approach towards improving knowledge sharing in CoPs, taking into account its specific context. The research approach of this project - Action Research, ensures the alignment between the objectives of the company and the scientific goals of this project. Thus, the knowledge obtained throughout the research process can be immediately applied. The paper is organized as follows. It begins by describing the chosen research approach and its specific characteristics. Further, it provides a review of the related literature, which guides the conceptual framework of this research. It then presents the findings in terms of challenges encountered by practitioners and the set of interventions that were chosen to be applied, as well as the results obtained. The paper concludes by addressing the implications of the findings and the limitations of this research.

2. Research Approach
The nature of the question addressed in this paper - a “how” question, calls for a qualitative research approach (Silverman, 2008). Furthermore, the research topic is situated at the intersection between the human, organization and Information Systems sciences. Given the objective to develop a systematic approach to improve knowledge sharing in a Community of Practice by looking at the challenges practitioners are experiencing, Canonical Action Research (CAR) was selected as the method of inquiry.

2.1 Canonical Action Research
One of the most important strengths of Action Research (AR) methods is the relevance of their results to real-life situations. Baskerville and Wood-Harper (1996) highlight the fact that in real-world environments alternative research methods have difficulties in maintaining relevance to practice. This is easily obtained through AR because of its empirical focus and its change through action approach. Among the different forms of AR available in the Information Systems field, CAR is the one most widely adopted in the social sciences (Davison, Martinsons and Kock, 2000). CAR was chosen as the research approach for this study, as a result of a good fit between the iterative, rigorous and collaborative process of CAR and the research question and setting.

In terms of the research design, Davison, Martinsons and Kock (2004) define five principles, intended to assure rigor and quality of the CAR project. These are:

- The principle of researcher-client agreement, which is intended to ensure that the researcher and the practitioners (clients) have a common understanding of the project, in terms of objectives, roles and responsibilities and methods employed.
The principle of the cyclical process model (CPM), which promotes the importance of systematically and sequentially following the five action research phases: (1) Diagnosis, (2) Action planning, (3) Action taking, (4) Evaluation and (5) Specifying learning.

The principle of theory, which emphasizes the need for a clearly articulated theoretical framework to guide and focus the activities and the evaluation of findings in relation to existing literature.

The principle of change through action is the essence of CAR, and emphasizes the indivisibility of action and change. In order to change the unsatisfactory conditions, appropriate interventions must be designed and implemented.

The principle of learning through reflection, which describes the process of specifying implications for both theory and practice by reflecting on results.

By adhering to these principles, this project addresses the reliability and validity checks, overcoming the limitations of the research method and balancing the commitment to practice and to the body of science.

2.2 Research process
Starting from the scientific and practical triggers and systematically following the phases of the AR cycle, this project took as input management guidelines provided by relevant literature on CoPs and analyzed how they can be applied in a geographically dispersed CoP, experimenting with them and discovering new ones. This project was completed in one AR cycle, following the five phases of CAR.

The Diagnosis phase consisted of an initial literature review which guided the building of the theoretical foundations of this project and the initial theoretical assumptions. Furthermore, this phase involved a data collection process consisting of five exploratory and two expert interviews and a questionnaire launched in the EMEIA Program Management Community. The overall response rate of the questionnaire was 15%. This rate matches the initial expectations, because in general in CoPs the active group is relatively small, representing 15-20% of the total number of members (Wenger, McDermott and Snyder, 2002).

Using these techniques, the research team assessed the challenges as perceived by practitioners as well as the potential solutions. The literature study was continued throughout the research process to support the adjustment of the theoretical framework in order to reflect findings.

During the Action planning phase a written report of the results of the diagnosis phase was built. Based on it, the initial situation was assessed and the options for solution strategies were explored.

The Action taking phase consisted of a set of interventions, together with follow-up meetings to re-evaluate the situation and the plan. The analysis of the findings is presented in the Results section.

The Evaluation phase consisted of gathering and comparing usage statistics of the community and conducting further interviews to thoroughly assess the results.

At the end of the project, the Reflection phase consisted of integrating and analyzing the results of an ongoing process of reflection throughout the previous phases. To this respect, the reflective journaling research technique played an important role.

3. Related work
The term “Communities of Practice” was first introduced by Lave and Wenger (1991), when studying the process of learning in informal groups, as newcomers joined an established community and became established members. Since then, the concept was extended and applied in commercial contexts as a Knowledge Management instrument (Hildreth and Kimble, 2004). In the organizational context, CoPs are defined as groups “whose members regularly engage in sharing and learning, based on their common interests” (Lesser and Stork, 2001). In describing CoPs, Wenger, McDermott and Snyder (2002) have formulated a structural model, which comprises three main elements as the foundation of any effective CoP: Domain, Community and Practice. Defining these three fundamental elements helps in establishing the objectives and value of the community (Wenger, 2004).

In globally dispersed communities of practice, the focus of this research, distance is an important issue in setting up and managing the community. Fabriek (2007) proposes the following dimensions
of distance: location, time, culture, organization and stakeholder (based on Carmel and Agarwal, 2001). While the first three are self explanatory, the following two refer to organizational culture differences and the differences in expectations of each group of stakeholders, respectively. Wenger, McDermott and Snyder (2002) recognize the following external, independent elements to add complexity to the challenges experienced by CoPs in maintaining participation and regular knowledge sharing: culture, size, (geographical) distance and organizational affiliation.

There have been only few studies on community maturity or developmental stages models in the literature on geographically dispersed CoPs. Dubé, Bourhis and Jacob (2006) suggest that establishing the phase in which the CoP is can help in identifying the challenges that a CoP is facing and the actions and decisions that will lead to success. The developmental stage addressed by this research is the coalescing one. At this stage the community begins to define itself, the focus being on context and memory creation (Gongla and Rizutto, 2001). Gongla and Rizutto (2001) refer to the core group of the community as the initial members who are in charge of supporting the coalescing process. Dignum (2005) emphasizes the importance of developing a sense of identity among the CoP members, by involving the members well from the beginning of the CoP development and by aligning the CoP objectives with strategic priorities and with members’ expectations and needs. The key domain, community and practice challenges are, respectively, to establish the value of sharing, to develop relationships and trust and to discover what knowledge needs to be shared and how.

Based on the work of Wenger et. al (2002), Gongla and Rizutto (2001) and Dignum (2005), the following leading practices have been identified as applicable to coalescing communities: (1) build a case for membership; (2) identify opportunities to provide value; (3) initiate community events and spaces; (4) build connections between core group-members; (5) find ideas, insights, practices that are worth sharing; (6) document judiciously; (7) legitimize community coordinators; (8) engage managers; and (9) create roles and norms.

4. Research results

During the Diagnosis phase, the research setting was determined and analyzed and the results were reported to the core team of the community. The resulting data was further discussed with the scope of defining the situation, identifying the problems and formulating the diagnostics.

The data collection had three purposes, adhering to the objective of the research:

- To define the community characteristics and context;
- To determine the challenges in knowledge sharing;
- To determine the best practices which would improve collaboration and knowledge sharing.

The data collection was targeted to a dual audience: (1) the steering group of the community, composed of sponsors, community manager, core team and knowledge managers, and (2) the practitioners subscribed to the community. The employed techniques described in the research approach section were chosen taking into account the size of the targeted groups, as well as the nature of the data to be obtained.

4.1 Research setting

The research took place at Ernst and Young, a well-known consultancy organization in the global market of assurance, tax, transaction and advisory services. As a global organization, Ernst & Young has offices in more than 140 countries grouped across four geographic areas. The more than 100 formal CoPs at Ernst & Young are supported by an enterprise-wide knowledge sharing strategy promoting widespread collaboration and knowledge sharing. In 2010, a social networking application was introduced enterprise-wide, offering the possibility to create an online home for communities spanning across geographical boundaries. The application integrates Web2.0 functionalities such as blogs and wikis (APQC, 2010).

One of the main 2011 focuses of the EMEIA management team of Ernst & Young was to develop and implement a Program Management competency framework that would support the successful delivery of large business transformations to their customers. The initial situation, as described by the EMEIA Program Management leader, was that Program Management was organized differently across areas and even across business units. Moreover, there was a lack of common understanding of the concept. After being approved by management, the EMEIA Program Management Community was launched in September 2010 at a meeting of the sub-area Program Management leaders, which
became the core-group of the community. The agreed main objective of the community was to facilitate knowledge exchange among Program Management practitioners. The main knowledge exchange environment was the online community space set up by the community manager using the social networking application described above. However, after several months from launching the community, the core group of sub-area leaders was still confronted with the challenge of generating the necessary energy for the Program Management practitioners across EMEIA to coalesce into a community. This constitutes the practical trigger of this research project, which aims to facilitate the creation of a knowledge sharing culture in the EMEIA Program Management Community.

4.2 Challenges
A brief summary of challenges initially expected based on the literature research and on identifying the specific structural characteristics of the EMEIA Program Management Community is given below:

- Specific to the coalescing stage: establishing the value, developing trust and relationships, discovering the specific knowledge to be shared (Wenger, McDermott and Snyder, 2002);
- Specific to the geographically dispersed structure: less opportunities for informal networking, time-zone differences, not knowing people personally, different priorities and lack of time, different communication styles and values, areas with potential technological issues (Hildreth and Kimble, 2000; Fabriek, 2007; Ardichvili et al, 2006; Wenger, McDermott and Snyder, 2002);
- Non-specific: getting and maintaining interest of practitioners, low level of reciprocity, no prior community experience (Dubé, Bourhis and Jacob, 2006; Verburg and Andriessen, 2011).

Table 1. Top 5 challenges identified by the means of questionnaire

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<thead>
<tr>
<th>Rank</th>
<th>Challenge</th>
<th>% agree/ strongly agree</th>
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<tbody>
<tr>
<td>1</td>
<td>Reliance on personal relationships</td>
<td>60%</td>
</tr>
<tr>
<td>2</td>
<td>Time constraints and priorities</td>
<td>50%</td>
</tr>
<tr>
<td>3</td>
<td>Reliance on external sources</td>
<td>39%</td>
</tr>
<tr>
<td>4</td>
<td>Developing relationships, given the means of interaction</td>
<td>28%</td>
</tr>
<tr>
<td>5</td>
<td>Value of contribution</td>
<td>19%</td>
</tr>
<tr>
<td>6</td>
<td>Technological issues</td>
<td>19%</td>
</tr>
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The results of the diagnosis indicate that our initial assumptions are partially valid. The challenges confirmed by this study were (Table 1): establishing the value (not seeing the value of contribution), different priorities and lack of time, lack of face-to-face interaction (less opportunities for informal networking and not knowing people personally), differences in cultural context and technology issues. Establishing trust and discovering the specific knowledge to be shared did not stand out as important challenges, and culture was only mentioned from the point of view of the differences between the contexts in which the knowledge was created and will be applied. Time-zone differences were not identified as challenging, while technology issues were only weakly supported by our results as a challenge to knowledge sharing. An important challenge identified was the lack of management support, which could be a consequence of the dispersed structure, or simply of the immaturity of the knowledge culture.

Only one important inconsistency was identified between the results of the interviews and of the questionnaire conducted during the Diagnosis phase, respectively the lack of time. This challenge was one of the most mentioned ones in the questionnaire responses, but it was not stressed during the interviews. Because the interviews targeted a slightly different group of stakeholders, this result of the questionnaire was considered valid.

4.3 Leading practices
When asked what would motivate them to actively participate in the knowledge sharing processes of the EMEIA PM Community, most of the respondents were positive about all the suggestions (Table 2).

Table 2. Motivators to knowledge sharing identified through the questionnaire (top 4)

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<th>Rank</th>
<th>Motivator</th>
<th>% agree/ strongly agree</th>
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The literature study identified a number of CoP management guidelines aimed at engaging practitioners in the knowledge sharing processes of the community. However, the hypothesized set of guidelines for managing a geographically dispersed CoP was only drawn after making a snapshot of the EMEIA Program Management Community, by identifying its key characteristics. The results of the Diagnosis phase, both in terms of challenges and best practices were then used to refine the guidelines identified in literature (see end of section 3), leading to the following list of CoP managing guidelines. An important aspect is that this list takes into account the maturity level of the community, being specifically designed for the coalescing stage:

- Ensure alignment between community objectives, business objectives and members’ expectations;
- Establish clear roles and responsibilities;
- Ensure strong leadership;
- Connect people to people;
- Create a community agenda with regular events to establish a rhythm;
- Promote awareness and communicate value;
- Promote and leverage technology thoughtfully;
- Create meaningful recognition and reward opportunities;
- Sustain member engagement throughout the community’s life cycle;
- Monitor community evolution and measure its health.

Based on these guidelines, an action plan was agreed together with the community leader and the core team. The plan also took into account the following project constraints: time constraints, strong dependence on stakeholders’ commitment and unavailability of substantial funding. These constraints have restricted the action plan to mostly codification interventions and second of all, have made face-to-face events with the extended community not possible. The main objectives were to facilitate connections between members, make participation easy by providing clear guidelines, create a support structure to sustain engagement and use social media to raise awareness and create recognition opportunities. Some key activities established by the action plan were defining and publishing stakeholders’ roles and responsibilities, selecting a supporting board of knowledge champions, defining and initiating a content collection strategy, providing guidelines on how to contribute using the social media platform and setting up a community calendar.

The implementation progress and results were monitored and discussed during the monthly EMEIA Program Management Community call with the community and sub-area leaders. A typical agenda of these calls consisted of updates at the EMEIA level as well as at the sub-area level. The topic of knowledge was added to the agenda of each call and consisted of updates on interventions and feedback from participants. Apart from this, feedback on interventions was collected from the community and from the EMEIA Advisory Knowledge Leader of Ernst & Young.

The evaluation of interventions showed an improvement in the engagement of practitioners in the community and in knowledge sharing (See Table 3).

### Table 3. Statistics for the EMEIA Program Management Community

<table>
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<tr>
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<tbody>
<tr>
<td>Number of members</td>
<td>246 (end of Jan.)</td>
<td>407 (end of June)</td>
</tr>
<tr>
<td>Number of blog posts/month</td>
<td>1.7</td>
<td>3</td>
</tr>
<tr>
<td>Number of views/blog post</td>
<td>68.6</td>
<td>108.5</td>
</tr>
<tr>
<td>Number of comments/blog post</td>
<td>1</td>
<td>1.3</td>
</tr>
<tr>
<td>Number of forum posts/month</td>
<td>&lt;1</td>
<td>2.8</td>
</tr>
<tr>
<td>Number of replies/forum post</td>
<td>&lt;1</td>
<td>&lt;1</td>
</tr>
</tbody>
</table>
The action research project created the opportunity for analyzing the knowledge sharing and collaboration in a CoP in the coalescing stage, in a geographically dispersed environment, being part of a constellation of communities.

Comparing the community statistics with the overall numbers for June 2011, the EMEIA Program Management Community showed good results:

- It situated itself in the small (8%) group of communities with over 100 members;
- It was one of the 33% of communities active in June;
- The community blog was one of the 9% blogs with more than 10 entries;

During the overall AR cycle we have developed and evaluated a set of best practices for guiding the management of a geographically dispersed CoP in the coalescing stage. The evaluation of results led to several learnings, which can be refined in best practices and added to the initial model. These were:

- Linking the community with other CoPs and knowledge support structures in order to optimize the Knowledge Management process;
- Integration of knowledge as secondary discourse in the CoP knowledge sharing processes;
- Using blogging as a main knowledge sharing tool; using other social media and e-mailing as supporting tools for enriching the communication, in the absence of the face-to-face element;
- Finally, reducing the impact of the virtual structure of the community by organizing regular meetings with the steering group of the community. This helped ensuring alignment, inclusiveness and global sharing of practices.

Furthermore, the research revealed a number of insights for enhancing knowledge sharing and collaboration, such as:

- Annual face-to-face meetings for online communities;
- A knowledge support team;
- Corporate blogs for thought leadership;
- Public social media platforms (LinkedIn, Twitter) for enhancing knowledge sharing;
- Metacognition - meta-communities for CoP management support.

5. Conclusion
A first contribution of this research concerns the examples of best practices, and how they can be implemented, as presented in the results section. Secondly, the study provides a systematic approach to managing a CoP, by applying the following steps: (1) assessing the key characteristics of the geographically dispersed community; (2) assessing challenges, (3) assessing best practices that match the particular situation; (4) implementing the best practices identified and (5) evaluating the results and defining a future direction.

The global relevance of the results of this study is achieved through analytic generalization, which is defined by Yin (1989) as the making of logical inferences. The relevance of the findings presented in this paper to the body of research can be demonstrated by identifying patterns in the specific context of the studied CoP and generalizing them. The EMEIA Program Management Community provides an example of a geographically dispersed, managed, coalescing CoP, built around the Project and Program Management domain. The first two characteristics are common among CoPs in multinationals and large corporations, while the third is a critical development stage through which any community passes. Still, the results cannot be automatically generalized to every domain. For example, the research of Chanal and Kimble (2010) regarding the two identified types of communities – of Project Leaders and of Scientific Experts, revealed that these different communities have their own characteristics and different behaviours. So further research is required to understand if the insights highlighted here would also be applicable to more technical CoPs.

The limitations of this research come mainly from the generalization of the outcomes, as a result of conducting a qualitative inquiry. To this respect, conditions, which have not emerged in this study, may affect knowledge sharing in similar contexts. Future research should be therefore performed to test the validity of our conclusions when applied to similar CoPs. Furthermore, the extent to which

<table>
<thead>
<tr>
<th>Number of wiki contributions</th>
<th>0</th>
<th>12 pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of uploaded files/month</td>
<td>2.6</td>
<td>3.8</td>
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each of the established best-practices had a positive impact on knowledge sharing could be assessed by performing a longitudinal study in a more controlled environment. Additionally, future research could also explore these practices in order to establish the extent of their impact or influence in a distributed CoP.

References