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A Multifaceted Approach to Distributed Communities of Learning and Practice

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Abstract
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A MULTIFACETED APPROACH TO DISTRIBUTED COMMUNITIES OF LEARNING AND PRACTICE

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Abstract: In the electronic age, locally-driven regeneration of the concept of community could be enabled by a flexible, multifaceted model where new information and communication technologies are the catalyst. However technology, no matter how advanced, is far from providing the complete answer and it is essential to take an integrated socio-technical approach to this issue. This paper reports on two cases that are part of ongoing research into distributed communities, framing them as phases of an activity system in expansive learning cycles in the context of a program of innovative learning. This research demonstrates that such communities are viable, with a wide range of benefits, however more work needs to be done in order to determine if they are sustainable, economically and socially, in the future.

Keywords: Communities of practice, virtual communities, experiential learning, team-work, Activity Theory, socio-technical approach

1 INTRODUCTION AND JUSTIFICATION

There is an increasing awareness that knowledge creation and innovation can be achieved through communities of practice (Wenger, 1998) and new information and communication technologies (ICT) can be the catalyst to form and sustain heterogeneous communities where it is imperative to share knowledge and skills. With the support of the Internet, and other groupware tools, communities of practice and learning can include people who are widely dispersed in location anywhere on the globe, have differing patterns in their uses of time as well as vastly different personal characteristics and capability. The benefits of such communities are so significant that governments and corporations are seeking ways to encourage their establishment and continued existence (Mentzas et al., 2001). However there are no simple measures that can be put in place, by governments or other official agencies, to accomplish this. A greater understanding of how this can be done is required. In an age of globalisation, it is imperative to augment our knowledge of how current technology can assist in bringing together, for a variety of purposes across traditional regional, state and national boundaries, groups from business and education, city and country, young and old, experts, instructors and learners, to halt the decline in social capital.

It is our assertion that that a locally-driven regeneration of the concept of community in the electronic age could be enabled by a flexible, multifaceted approach which would create, nourish and support new forms of communities. Technology, no matter how advanced, is far from providing the complete answer and it is essential to take a holistic socio-technical approach to this issue. The most significant aspects of our multifaceted approach are: the integration of the learning and practice of all community members in addition to a balanced emphasis on the social and technical components of communities from both theoretical and practical points of view. The principal objective of this paper is to draw on the results of current research to better understand the necessity for such a multifaceted approach to the creation and maintenance of distributed communities.

1.1 Background

There are many who believe that electronic technology is a significant cause of the trend to "individualising" work, learning and leisure time (Putnam, 1995) but it may also help enable the reversal of this trend. However there are other issues that must be considered, both separately and as a whole, in the search for a functional model of communities that rely on electronic technology. The most significant of these issues, for our research, are identified as follows.

1. It is essential that, to work effectively, membership of effective organic communities of practice and learning should be voluntary and informal (McLure-Wasko and Faraj, 2000). This implies that there must be an accepted purpose for which the community exists, people must be motivated to belong and receive some benefit from their participation. This focus, around which a community can develop and grow, is a prime issue for consideration in this research.
2. One motivation for the formation of the communities relates to the capacity of the Internet for promoting growth in regional rural areas both for business, thereby providing employment and halting the drain, particularly of young people, seeking work in already overpopulated cities (Delong et al., 2002) and for flexible modes of education (eg. Renzi and Klobas, 2002). This provides us with the opportunity to investigate the feasibility of bringing the business and educational activities together, both to give students a "real-world experience" and to put business people in touch with the latest in business techniques and technology, and perhaps future employees. The importance and practicability of creating a diverse community, where each can contribute, is a second aspect of our research.
3. The relationship between doing and learning is well recognised (Virkkunen and Kuutti, 2000; Vygotsky, 1978) and this sort of community can take advantage of the value of an experiential educational process in the promotion life-long learning and professional development (Alon and Cannon, 2000). Educational theorists have long recognised that people learn from interacting with others and through their active involvement in interpreting and making meaning of their environment so that collective knowledge is constructed through collaboration (Renzi and Klobas, 2002). So a third concept that we have adopted is to incorporate opportunities for experiential learning through team-based projects in the community setting.
4. A basic ingredient for effective teamwork is the formation and development of trust between team-members. This is true in both traditional and virtual settings, but is made more difficult with a virtual team which consists of geographically dispersed individuals who interact, maybe for only a short period of time, guided by a common purpose with links through

communications technologies (Panteli, 2002). Where the need for trust in such communities is recognised, there are two, not mutually exclusive approaches: conducting team-building exercises or combining face-to-face with online interaction. The importance of balancing virtual and direct interaction to sustain communion among people (Dede, 1996) is a fourth consideration for our research.

5. A fifth area of consideration is the interaction between the human participant and the technology. Research into online learning has recognised how the frustration of students with the technology inhibits the learning process (Renzi and Klobas, 2002). On a more positive note current work on the use of asynchronous learning networks, has shown the value of threaded online discussion where students have time to consider their responses to the conversation which encourages them to collect and evaluate knowledge and create their own learning strategies (Caverly and Macdonald, 2002).

These five multifaceted issues appear to be crucial for the development of a model of distributed communities of learning and practice, where the term "model" is meant as a guide for behaviour rather than prescriptions. This follows the approach of the Computer-Supported Cooperative Work community where models are seen as "interpretations, as constructions, which for some purposes, under certain conditions, used by some people, in certain situations may be found useful, not true or false" and the modelling process as one of reframing rather than describing or abstracting (Bannon, 1999).

2 RESEARCH PROBLEM AND OBJECTIVE

The objective of this research is to increase the understanding of how individual and community growth can be promoted, supported and maintained in distributed communities with an integrated application of currently available technologies and social learning systems. This understanding is embedded in a multifaceted model of community that is both used and developed throughout the research process, incorporating both social and technical aspects. In order to conduct this research, a multidisciplinary, holistic approach is adopted to study two cases, using a developmental work research (DWR) approach (Engestrom, 1987), where communities of learning and practice are viewed as activity systems (Virkkunen and Kuutti, 2000). DWR provides a dynamic framework that can accommodate a multifaceted analysis of the community members, their motives and purpose for belonging, their relationships within the community and the tools that mediate community activity.

The developmental approach implies that the modelling aspect of the research will be evolutionary, incorporating our growing understanding of the five concepts outlined above as it is applied in each of the cases. These will be done by explicitly categorizing the following

1. The purpose of community, including what can it achieve, the length of its tenure, and ways by which innovation can be enabled and stimulated through community cooperation and knowledge sharing.
2. The extent of diversity in the community and how different members are encouraged and their contribution valued
3. The mix of work and learning in the actions of the community and how learning occurs experiential, team-based, project oriented, activity.

4. How trust is developed, how teambuilding occurs and the contribution of different aspects mixed mode interaction, in particular face-to-face, video-conferencing and online (virtual).
5. How different characteristics and capabilities of the people and technology affect the viability of the community, identifying the functions of technology and skills of people that need to be enhanced.

This raises the question of how to evaluate the viability, and indeed success, of a particular community and thereby the quality of the model. Initially the following questions are posed, however an additional objective of the research is to determine what make a successful community and for whom.

- What is the viability, sustainability and limitations of the multifaceted model of learning given the needs, infrastructure, social and cultural mix of the target community?
- What are the demonstrable benefits to the learner, to the community and to the educators of this activity?
- How are people motivated to participate in communities of learning, particularly those that are set up to support rural business and community development?
- How to grade individual participants in team-based experiential learning activities which are part of an accredited course?
- How can this activity be cost effective and efficient?

3 RESEARCH DESIGN AND METHODS

In this research, participatory studies of two cases have been used to investigate how well a combination of technology, social awareness and educational techniques, can support and enable communities of learning and practice. Each project was a response to a real need in a rural setting adapting a model used on a similar project in an urban environment. The multifaceted model begins with a face-to-face workshop followed by a period online where learners, experts and instructors are linked by a special-purpose, Internet-based communication and group-support package. During this period the community of learners undertake a team-based, problem-solving project where experiential learning takes place through the generation of skills, ideas and solutions.

The progress of the projects were recorded and analysed, using a developmental research method, as dynamic activity systems, which contribute to expansive learning cycles, in the manner of Engestrom (1987). Development research is disciplined investigation conducted in the context of the development of a product or program for the purpose of improving either the thing being developed or developer. It is therefore ideal for this investigation as it is both contextual and evolutionary, where a prototype model is constructed, used with the target group, which is observed and questioned before the prototype revised. In our research the model incorporates technology together with social and learning processes and discipline is imposed on our investigation by the analysis of each case as an activity system, in the tradition of the Cultural-Historical Activity Theory.

In an activity system the unit of analysis is the work activity itself, which is culturally and historically located. Engestrom (1987), who first applied the theory to workplace learning, shows that the work activity system is comprised of the following components:

- the purpose to which members of the community direct their activity

- individual workers/learners, their colleagues and co-workers/learners
- the conceptual models, tools and equipment they use, and
- the rules, culture and context that govern how they work, and learn through their work

In Activity Theory and DWR, all of these elements are analysed together as a unified and dynamic whole. A key feature of the DWR approach is that activity is mediated both by tools from the particular culture and setting and by the less visible social mediators of work activity. The holistic nature of Cultural-Historical Activity Theory allows us to consider learning and doing as an integrated whole.

This paper will describe two cases that are part of ongoing research into distributed communities, framing them as phases of an activity system in expansive learning cycles in the context of the whole program. An analysis of the cases will be presented as a description of each in terms of the four components of an activity system listed above followed by a holistic account of how the activity has developed through each case viewed as a learning cycle of the activity system. A discussion will then relate these results to the five issues identified in the section one of the paper as significant in the search for a functional multifaceted model of communities.

4 RESULTS

In this developmental research, innovative ICT and social systems have been used to support new forms of activity that meet several real needs in the community at once and represent an emerging solution of benefit to each of the active stakeholders. The two cases presented in this paper, implemented, in a rural setting, a multifaceted model of experiential, team-based learning that had already proved successful in creating awareness of the new science of Photonics among communities of high school student and teachers in a large city. The first case moved this activity into the rural setting although the object of the activity was the same as that of the previous city communities and the community was based in a single town. The second, subsequent case expanded the activity to incorporate a different purpose with a more geographically distributed community membership.

4.1 Background

The Australian Photonics industry has a research centre and several small spin-off companies at the Australian Technology Park. The centre piloted its innovative program to

- Increase awareness of the nature of Photonics and career opportunities in the field
- Enable direct links between interested young people, scientists and entrepreneurial business development in the field.
- Provide extended and enriched learning experiences for students in schools, colleges and universities.
- Work cooperatively with teachers, students and parents to create e-learning experiences and learning materials that motivate and engage young people in the adventure of entrepreneurial research and development in Photonics
- Facilitate pathways for people wishing to obtain qualifications and careers in the field.

The underlying need was to mobilise new knowledge and understanding of its importance to the community more quickly than has been possible through traditional educational activity. The motivation for the photonics industry was largely economic and a need to recruit able young

people, the motivation for students was a personal need to learn about new opportunities and to connect with real people with expertise, and finally the motivation for the education sector was to explore the possibilities of supportive relationships that enhance the learning opportunities in schools.

So a multifaceted approach was developed where scientists, business developers, teachers, technologists, museums and business people contributed to:

- Intensive workshops at the Technology Park,
- An online 'community of interest' that supports sustained creative activity as new materials are built and knowledge is exchanged.
- Community celebrations where young people show their creative work and explain their new learning and interest to members of the community including politicians, local government officials and the media.

Technologists and research students at the Technology Park, under the guidance of educationalists, collected a suite of ICT tools to support these endeavours, particularly the online community. So a successful activity system was developed as a community of learning and practice.

The enthusiasm of this group stimulated the activity into a cycle of expansive learning. They recognised the mediating effect of new ICT capability on such an activity and looked for an opportunity to extend the community outside of the city into regional areas where the model could be tested in a more distributed environment.

4.2 Case Study One: Innovative Science Awareness in a Regional School

The decision to expand the Photonics activity system into a regional high school, prompted an analysis of the model of learning that had been developed for it at the Technology Park in a major city, in order to understand how it would work in a small, distant country town.

A central principle of the research and development underlying the program is that innovation occurs most successfully when people engage deeply with others outside their usual day to day routine (Metzas et al., 2001; Engemstrom, 1999; Latour, 1996). The community is therefore designed for people who are prepared to actively engage in real tasks. In terms of Activity theory (Engestrom, 1999) it is designed to facilitate creative actions between formerly separate systems of activity rather than automating routine operations. The community also facilitates purposeful knowledge exchanges between different groups. Researchers play a modelling and mentoring role and also make suggestions for development projects. The students in the community are challenged to use their distinctive knowledge and skills to build challenging and interesting multimedia learning experiences for other students. They consult with scientists, seek help from technical experts and work in teams to build their solutions.

In the original activity, while the students and teachers came from different schools they were not far from each other or the scientists at the Technology Park. In new form of the activity it would be important to retain these principles but expand the cycle of learning. While the object, ie purpose, of the activity would be unchanged, there would be a difference in how the tools (ICT, processes and procedures) would be used, and the community (relationships, rules, culture and context). As stated above tools and community mediate the activity undertaken by people towards an object motivated by a purpose. In the expanded activity system, all the students and teachers would be at the same regional school and have well-defined existing relationships of power. The scientists and researchers would be in the city, five hours away and so the capability of the

technology, although of inferior quality of bandwidth and reliability, would play a more important role in communications with them.

It was decided to build the community as follows. The researchers worked with the school principal to select and engage a group of suitable and willing students, teachers and, if possible, parents and local business people. It was interesting that no parents or business people became part of the community. The researchers then travelled to the town to meet the group one evening socially and the following day run a workshop in an Education Centre opposite the school. The workshop was used for face to face community building, creating enthusiasm for experiential, project-based learning among the community and developing skills in the use of the technology. Although the scientist did not come, a videoconference was arranged between them, in the city and the rest of the community in the town, to build up trust as mentioned in the introduction. This was certainly worthwhile for both students and scientists. The students and teachers were then arranged into teams of 4 or 5 with complementary skills and began to plan to meet their challenge. This was to build the sort of exciting website that would attract people like themselves to be interest in Photonics. At the conclusion of the workshop a community had been formed with a common purpose and an appreciation of the value of their community for learning and practice.

The teams then spent the following eight weeks creating their solutions, communicating with each other at school and online with the researchers, technical experts and scientists. The teams then demonstrated their solutions at a function, attended by the researchers, the school principal and staff, parents, local dignitaries and the local media. This success inspired the next cycle of the activity system as a second case study.

4.3 Case Study Two: Information Systems Awareness in Regional Schools

The university, who delivered distance courses through the education centre used in the first case study, was impressed by the model of community learning evident in the Photonics case study. One of the lecturers asked to trial the delivery of one of its introductory modules in Information Systems with high school students to interest them in studying this course at the university after completing school. The researchers used this as an opportunity to extend the model to a geographically more diverse community and to expand the activity for a different purpose, focussed on a more specific learning outcome.

Students were motivated to sign up for this activity with the promise that they would be awarded a certificate of attainment by the university that would exempt them from the corresponding module if they undertook the course in information systems at the university. In this community the students came from different schools in towns up to two hours from the education centre and the researchers, experts and technical support were also located in different cities. There was considerable tension within the activity system following this change, as there was no longer backing from the expertise of Photonics so that a redevelopment of the ICT system and its support was required. Also many of the students worked from home, rather than at school, there Internet connections could be very unreliable. However the activity went ahead using the same model of a face-to-face workshop followed by an eight week online period of experiential learning where students, in teams, identified and built "information systems" such as web pages, brochures, databases, each for a small virtual business that they created for the exercise. Preparations for a celebratory presentation evening of the outcomes are underway at the time of writing this paper.

4.4 The Next Cycle

The researchers claim that the fact that the communities have worked and learnt together harmoniously and productively for the intended time and produced innovative and exciting outcomes provides evidence that the model has merit. However, as with all activity systems, a new learning cycle builds on lessons learnt from the previous one. In this activity growth requires at least two changes, one is to extend the membership of the community beyond school students in these regional areas. The other is to keep improving the supporting technological and social systems. A new community is currently being formed in another town in a nearby region. This will again focus on the learning of introductory information systems concepts but will include both school students and other members of the local community. In addition the ICT application will be made more robust for low bandwidth connection, more modular and undergo usability testing. The processes are also being accessed to make these communities financially viable once they move out of the research arena.

5 DISCUSSION

In this developmental research there is no requirement of an absolute end to the learning cycles of the activity system or any way in which formal criteria can be set against which success or failure can be measured. Instead the emphasis is on improvement both of the thing being developed and in the understanding of the developers, in this case the researchers. For the research team, a major aim of the developmental process is to learn to identify the indicators of success. The results above are now discussed in relation to the five issues identified in the section one of the paper as significant in the search for a functional multifaceted model of communities.

1. Community purpose, cooperation and knowledge sharing. Through each cycle of the activity system it became clear that each of the communities had a common purpose in sustaining the community to complete the team projects and that this could best be achieved through cooperation, even across teams, and through knowledge sharing. A key component of the model is to engender this from the beginning and that awareness-sessions, and team-building exercises in the initial face-to-face workshops, are invaluable. The literature cited above supports the view that this is much more difficult to achieve in purely online groups. Case one indicated that where face-to-face was impossible, videoconference may be helpful as a substitute. Critical to the learning process is the opportunity to engage in practice with others involving sustained relations over time among community members and contexts in which they function and among more and less experienced colleagues (Moore and Barab, 2002).
2. The extent and valuing of diversity. In each case teams were set up in an effort to included a mix of technical, artistic, and social skills and those with similar attributes, or who knew each other, were encouraged to split up. In case one, teachers and senior students were distributed across teams and, in case two, students from the same school did not work together so that communication was mostly conducted using the threaded discussion facility online. The value of asynchronous learning networks has been recognised by others. Caverly and MacDonald (2002), for example, describe how online asynchronous threaded discussions, when orchestrated appropriately, create a group orientation where individuals help each other reach goals, are productive because of the think-time students are given and the inherent cooperative grouping, encourage students to invest energy to support each other and have a

high value to achieve and create positive interpersonal relationships as group members engage each other for assistance. This also has an advantage for the researchers in that their discussion is visible to them.

3. The blurred boundaries between work and learning: One reason for basing our model on Activity Theory is that an activity system, by its very nature, brings work and learning together, so that both tools and community mediate both. Delong et al. (2002) have noted that, in rural areas in particular, there is an increasing need to diversify and optimise economic opportunities in order to maintain both economic and community viability. They recommend that a carefully developed program for use of the Internet could be a valuable resource for rural businesses where participants with common, overlapping interests can become a community of learners. In fact rural areas are ideally placed to take advantage of e-commerce solutions to both business and education.
4. The development of trust: Through the learning cycle experiences trust develops as part of the relationships between the members of the community, an issue addressed in points 1 and 2. However, participants also learn to trust in the fact that a new form of learning occurs through the experience of interacting with others towards a common goal and that this learning is as valid as, and much more relevant than, that which takes place in a traditional classroom where instruction remains primarily didactic, dominated by lecture, demonstration, textbook readings and memorisation. Communities of practice and learning offer a new way of looking at and approaching professional development that is not something you receive, but something in that you invent creatively through participating reflectively as a part of your everyday activities (Moore and Barab, 2002).
5. Integrating the functions of technology and skills of people: One of the aims of the research was to create a new socio-technological infrastructure that would enable and support the kind of community of learning practice envisaged in the introduction to the paper. In summary the socio-technological context of our model provided a new system of cooperative activity that:
    - Enthuses and informs young people, in rural and city regions, about new scientific and technological developments and the opportunities for them in the emerging industry
    - Cooperates with existing education providers in the development and marketing of new courses and in recruiting students to the courses
    - Enables innovators of all kinds, researchers, developers, business entrepreneurs to communicate more effectively and efficiently with the wider community.

People are most motivated to use new technologies for purposes to which they have commitment and where they understand the benefits and the need to change. These conditions are fostered when people actively participate in creating the solutions they will use. The outcomes of case one were cost effective and realistic in terms of projected recruiting needs for the industry. For people using scientific and technical applications, innovation is always a forward-looking adventure in which the risks are measured against the possible benefits. A key aspect of the Photonics Program is to provide an ICT enabled and extended context that supports and facilitates a similar journey for young people.

Both cases are working examples of applied design that enables researchers, industry, business and the education sector to work together in new ways that effectively mobilise new knowledge. The evolving multifaceted model reinforces the need for an integration of processes recommended by others (Moore and Barab, 2002; Caverly and MacDonald, 2002) where social participation refers to not just local events of engagement in certain activities but a more encompassing process of being active participants in the practices of social communities that

have collaborative workspaces with face-to-face workshops in addition to virtual ones where community members can

1. respond not only to the instructor but to workers and learners
2. engage in advanced reasoning process: identifying a problem, the details and beliefs/assumptions about the problem, apply problem solving and engage in strategy production.
3. be encouraged and supported in their interactive processes (where skills are developed to get to know each other, to communicate unambiguously, constructively resolve conflicts, to collaborate towards a commonly accepted goal).
4. allow social processes to occur for group cohesiveness, so that remote members become part of the academic, scientific and business community, to create positive interdependence.

6 CONCLUSION

The authors believe that this research continues to meet its objective of increasing the understanding of how individual and community growth can be promoted, supported and maintained in distributed communities with an integrated application of currently available technologies and social learning systems. The cases presented here demonstrate the usefulness of a multifaceted model of community that is continually improved through a developmental research approach where it is seen as a tool for a dynamic activity system.

At the end of section 2 of the paper a series of pragmatic questions were posed about the viability of maintaining learning and practice in diverse communities, which can only exist with the aid of innovative uses of ICT. We claim that this research does, to some extent, demonstrate that such communities are viable with a wide range of benefits however more work needs to be done in order to determine if they are sustainable, economically and socially, in the future.

REFERENCES

Alon, I. and Cannon, N. "Internet-Based Experiential Learning in International Marketing: The Case of Globalview.org", *Online Information Review*, (24:5), 2000, pp. 349-356.

Bannon L. "CSCW A Challenge to Certain (G)DSS Perspectives on the Role of Decisions, Information, and Technology in Organisations?", 1999, Available in http://www.ul.ie/~idc/library/.

Caverly D. and MacDonald L. "TechTalk: Online Learning Communities", *Journal of Developmental Education*, (25:3), 2002, pp. 36-41.

Dede C. "Emerging Technologies in Distance Education for Business", *Journal of Education for Business*, (71:4), 1996, pp. 197-204.

Delong M., Gahring S., Bye E. and Johnson K. "Using the Internet to Enhance Business Opportunities in Rural Areas", *Journal of Family and Consumer Sciences*, (94:3), 2002, pp. 33-38.

Engeström Y. *Learning by Expanding: An Activity-Theoretical Approach to Developmental Research.* Helsinki: Orienta-Konsultit, 1987.

Engeström Y. "Expansive Visibilization of Work: An Activity-Theoretical Perspective", *Computer Supported Cooperative Work*, 8, 1999, pp. 63-93.

Latour, B. *Aramis or the Love of Technology*, (Catherine Porter trans.), US: Harvard University Press, 1996.

McLure-Wasko M. and Faraj S. " 'It is What One Does': Why People Participate and Help Other in Electronic Communities of Practice", *Journal of Strategic Information Systems*, 9, 2000, pp. 155-173.

Mentzas, G., Apostolou, D., Young, R. and Abecker, A. "Knowledge Networking: A Holistic Solution for Leveraging Corporate Knowledge", *Journal of Knowledge Management*, (5:1), 2001, pp. 94-106.

Moore J. and Barab S. "The Inquiry Learning Form: A Community of Practice Approach to Online Professional Development", *TechTrends* Washington, (40:3), 2002, pp. 44-50.

Panteli, N. "Trust Performances and Dramaturgical Plays in Virtual Teams", *Proceeding of ECIS2002,* Gdansk, 2002, pp. 1164-1173.
Putnam, R. "Bowling Alone: America's Declining Social Capital", *Journal of Democracy*, (6:1), 1995, pp. 65-78.
Renzi S. and Klobas J. "Developing Community in Online Distance Learning", *Proceeding of ECIS2002,* Gdansk, 2002, pp. 1384-1393.
Virkkunen J. and Kuutti K. "Understanding Organisational Learning by Focusing on 'Activity Systems' ", *Accounting, Management and Information Technology*, (10:4), 2000, pp. 291-319.
Vygotsky, L.S. *Mind and Society*, Cambridge, MA: Harvard University Press, 1978.
Wenger E. *Communities of Practice*, Cambridge: Cambridge University Press, 1998.

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