
Peer Production as An Ecology: A Cultural-Historical Extension of Communities of Practice

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Abstract

Peer production is an emerging concept describing an online community work structure in which participants can produce what they want without supervisory commands. However, human-computer interaction today has limited conceptual tools to discuss design issues in peer production wholly and meaningfully. I propose an ecological extension of the communities of practice concept already popular in HCI—by elaborating on interactions between communities and their cultural-historical development—to illuminate its conceptual blind spots hindering examination of the socially and economically important phenomenon.

Author Keywords

Peer production; activity theory; ethnography; starcraft; cryptocurrencies; concepts

Introduction

Peer production describes a work structure within an interest-driven online community in which participants can produce what they want without supervisory commands [1]. By prescribing a dose of freedom to workers' object of production (i.e., to volunteer for self-directed tasks or those proposed by other members), this small change mediates emergence of creative and economically influential online communities (e.g., electronic sports and cryptocurrencies). Currently, the human-computer interaction field has limited conceptual tools to fruitfully discuss the peculiar and

complex organizational practices within such an ecology, not to mention designing artifacts that can help these communities leverage, connect with, and contribute to the society and its institutions. This position paper describes basic tenets of an on-going conceptual development work, informed by activity theory and built on existing paradigms within HCI, to examine peer production.

By describing peer production as an ecology, I refer to its substantial composition of actors, artifacts, and social-technical practices that are vital to support a group's culture of currencies and reputation, learning and expertise, division of work, developmental trajectories, and connectivity—via technical artifacts, media contents, and social mobility—with external social groups and institutions. While human-computer interaction has begun identifying ways institutions can leverage productivity of online communities, the emerging concepts had often relegated participants' productive potentials as creative agents, learners, and knowledge contributors into the background. For example, crowdsourcing has borrowed notions of *outsourcing* to frame their online participants as individually isolated and low-cost labor taking "top-down directive" from institutional masters [2]. While such emerging concepts are obviously valid within narrowly conceived contexts (e.g., Amazon Mechanical Turks), they have limited use examining the full extent of social practices among peer producers.

Community of Practice: Current Issues

Human-computer interaction is not devoid of concepts describing social practices within communities. Taking on a system perspective, communities of practice (COP) examines the "simplest social unit that has the characteristics of a social learning system" [12]. At the core of COP is the concept of *legitimate periphery participation*, which describes the way new comers to a community first perform peripheral (non-critical but still essential) tasks in order to achieve mastery, acceptance, and get initiated into fuller participation

within the core community [10]. Most importantly, this work entrenched the now widely accepted idea that essential knowledge within institutions has to be cultivated by fostering employees' participation in interest-driven communities [12]. While legitimate peripheral participation helped advance our understanding of the importance of communities to institutions (i.e., in learning), this concept lacked descriptions of peer producers' *outer-workings* with a cultural-historical purview and thus limits its utility examining issues beyond institutional boundary.

One problematic assumption is that communities of practice can be mandated and designed by institutional management. Institutions are social groups managed by an authoritative set of individuals (i.e., the management) to ensure that every workers' time is efficiently allocated towards the realization of institutional goals [4]. Thus, their allowances for "top-down directive," also a key component in the crowdsourcing concept, is imperatively important for institutions to function. However, this directive has been found to be problematic when applied to communities of practice. For example, Schwen & Hara [11] and Chua [3], who had examined several corporate communities of practice, made similar observations that functioning COPs they had seen were not designed but had existed prior to the studies, and questioned whether learning interests could be mandated by management decree. While corporate top-down management of COPs are clearly not Lave and Wenger's intent, this issue highlighted a conceptual blind spot within the COP concept—that of not describing COPs developmental processes thus allowing institutions to project their hierarchical structure into the scientific concept [11].

The second problematic assumption is that expertise in a skill set can only be authenticated through legitimate participation of a (often institutionally-sanctioned) community of practice. Hodges [6] questioned this assumption, and argued that *dis-identification* (i.e.,

participants' distancing from a community of practice due to their discovery of an alternative and possibly better set of practices) is an admissible form of participation and learning experience. In her study of an apprenticeship program for Early Childhood Education teachers, she found that the views of young empathetic teachers are often marginalized and made peripheral by their instructors, and highlighted that COPs are also forms of "dominant social order(s)" that would resist innovations and changes [6]. Likewise, Handley, et al. [5] also pointed out that every community of practice is situated within a broader socio-cultural context. For example, a participant may at the same time participate in other COPs and get to deliberate on and remix different practices [5].

An Ecological Extension

While we have concepts such as communities of practice to explain fundamental characteristics of peer production (i.e., the membership and learning processes), these concepts hardly discuss inter-groups dynamics (Handley, Sturdy, Fincham, & Clark, 2006; Schwen & Hara, 2003), and also miss the productive significance of marginal but creative participants (Hodges, 1998). One, a community of practice needs to be reframed as an ecology that interacts with other communities of practice (e.g., an institution interacting with its voluntary communities). Two, a community of practice needs to be seen as a developing entity due to its participants bringing in fresh perspectives from their personal cultural experiences, to which may change the community's practices or reveal growth potentials along its boundaries.

I have been using ethnography to examine peer production practices in online communities (see [7,8,9]). In this workshop, I intend to share two case studies that is taking place in the electronic sports game *Starcraft*, as well as in the cryptocurrency communities.

Electronic sports are sporting leagues compete through networked games [8]. Perhaps not surprisingly, the notion of playing online games as sports had originated out of peer-driven gaming cultures: first among Korean youth competing in Internet cafes, and then became operationalized in the US with competition formats, productive roles, reputation structure, and training regime after ten years of dedicated practice among players [9].

Communities of practice participants do not simply learn from the core members; but are also able to formulate alternate pathways to master entirely new practices (Handley, Sturdy, Fincham, & Clark, 2006). For example, electronic sports players in the *Starcraft* case were often marginalized in middle schools and high schools. But we found that the game players, through positive interactions at home (often with supportive family members), within interest-driven school clubs and online communities, and in college, were able to find their way towards cultivating electronic sports practices [9]. Due to this cultural-historical process, electronic sports has now matured into a commercial industry [9].

Cryptocurrencies, sometimes known as *digital currency*, are a set of alternative money that can be transmitted over the Internet, powered by open source software tools, and rely on peer-to-peer networks of personal computing devices to record and transmit their global transactions. Cryptocurrencies were first developed by voluntary hackers to liberalize use of money on the Internet, but for this reason, were immediately scrutinized by institutional actors such as central banks and other regulatory bodies. This case is particularly interesting for examining contradictions and tensions between peer-produced innovations and the dominant institutional ecologies.

In cases of game modification by end-users and corporate communities of practice, researchers have found that creative work tends to get weakened when

organizational bureaucracies are strongest, since there is little incentives for workers to innovate when regulations and corporate policies take priority [11,7]. For the same reason, hackers have developed cryptocurrencies to function outside institutional regulatory frameworks so as to use money on the Internet more freely. If creativity implies the use of unconventional practices to solve problems, then many peer-driven innovations will, to various degree, unnerve existing regulatory frameworks that were developed to govern the older but dominant industries. The question is how then do such "out-of-line" peer-driven innovations given space to nurture and grow without being unduly repressed by the dominant industry?

Expected Contributions to the Workshop

I will contribute to the workshop by discussing how an ecological perspective can illuminate conceptual blind spots within a HCI concept. In particular, I will discuss the current use of communities of practice, and how it can be enriched and made meaningful through an cultural-historical extension. My interpretation of ecology, which draws considerably from Activity Theory, should be of interest to HCI researchers. Lastly, my case studies, which focus on examining structure, functioning, and development of the peer production ecology are relevant to the workshop topics. I also look forward to learn how other researchers use ecological concepts to resolve HCI problems, and to identify collaborators who are working on similar issues as my own.

References

- 1 Benkler, Yochai. *The Wealth of Networks: How Social Production Transforms Markets and Freedom*. Yale University Press, New Haven, CT, 2006.
- 2 Brabham, Daren. *Crowdsourcing*. The MIT Press, Cambridge, MA, 2013.
- 3 Chua, Alton. The Rise and Fall of a Community of Practice: A Descriptive Case Study. *Knowledge and Process Management*, 13, 2 (2006).
- 4 Drucker, Peter. *Concept of the Corporation (first published 1946)*. Transaction Publishers, New Brunswick, 2008.
- 5 Handley, Karen, Sturdy, Andrew, Fincham, Robin, and Clark, Timothy. Within and Beyond Communities of Practice: Making Sense of Learning Through Participation, Identity, and Practice. *Journal of Management Studies*, 43, 3 (2006).
- 6 Hodges, Diane Celia. Participation as Dis-Identification With/in a Community of Practice. *Mind, Culture, and Activity*, 5, 4 (1998).
- 7 Kow, Yong Ming and Nardi, Bonnie. Who Owns the Mods. *First Monday*, 15, 3 (2010).
- 8 Kow, Yong Ming and Young, Timothy. Media Technologies and Learning in the StarCraft eSport Community. In *The 17th ACM Conference on Computer Supported Cooperative Work and Social Computing* (San Antonio, TX 2013), ACM Press.
- 9 Kow, Yong Ming, Young, Timothy, and Tekinbaş, Katie Salen. Crafting the Metagame: Connected Learning in the StarCraft II Community. *Work Papers Series of DML Research Hub* (2014).
- 10 Lave, Jean and Wenger, Ettiene. *Situated Learning: Legitimate Peripheral Participation*. Cambridge University Press, Cambridge, UK, 1991.
- 11 Schwen, Thomas and Hara, Noriko. Community of Practice: A metaphor for online design. *The Information Society*, 19, 3 (2003).
- 12 Wenger, Ettiene. Communities of Practice and Social Learning Systems: the Career of a Concept. In *Social Learning Systems and Communities of Practice*. Springer, 2010.