

Remix culture: an empirical analysis of creative reuse and the licensing of digital media in online communities

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Giorgos Cheliotis
School of Information Systems
Singapore Management University
80 Stamford Road
Singapore 178902
giorgos@smu.edu.sg
gcheliotis@gmail.com

Extended Abstract

This extended abstract is based on a research report that has been made available on <http://pml.wikidot.com> but has not yet been presented at a conference or workshop. We explore the nature and impact of creative reuse in the production of digital media by analyzing the output of an innovative online music sharing community, ccMixer. The dataset is of great significance because this is one of only a handful of online communities which do not only allow for the sharing of user-generated content, but also track the evolution of content after it has been published online and encourage reuse of the content for the production of new works. All content on ccMixer is legally uploaded, copyrighted, and licensed under Creative Commons. Much has been written about the birth of a new “remix culture” on the Internet and how collaborative Web 2.0 technology has led to an explosion of user-generated content. But very little is known about the process of developing digital media in an open and collaborative fashion, the incentives of participating authors, and the outcomes of their actions. Based on our earlier studies of Creative Commons licensing [1] and the analysis of this unique online community we hope to shed more light on the structure and dynamics of such activities by providing some of the first visualizations ever of large-scale remixing activity and presenting our preliminary findings.

Creative reuse is the process whereby one or multiple works, or parts thereof, are combined into a new work that is original, i.e. a non-obvious extension, interpretation or transformation of the source material. The practice of reuse is widespread in our society and permeates many otherwise unrelated activities, from industrial manufacturing (building complex systems out of simple multi-purpose parts) to software design (code reuse), and from scientific publishing (reuse and citation of prior work) to fashion design (reuse of patterns, fabrics and designs), just to name some examples.

While the creative process is still to some extent associated with the archetypal image of a single creator working copiously and in isolation to produce a work that is entirely personal, in the age of the participative Web new works are increasingly the result of collaborative and iterative efforts between small or even very large groups of user-creators, utilizing shared pools of reusable and malleable source material. This evolution towards more social modes of cultural production exemplifies and amplifies the significance of the observation that “creativity always builds upon the past”, a phrase commonly attributed to Professor Lawrence Lessig, founder of Creative Commons [2]. Creative Commons (CC) is a set of licenses with which authors can grant their au-

dience certain freedoms (such as the freedom to remix a work), thus voluntarily relaxing some of the restrictions of copyright.

Since the launch of Creative Commons in late 2002, the licenses and the communities that use them have grown to millions of users and have spread around the world, as our earlier research has shown. Yet still today very little is known about the incentives of authors who will permit the creation of adaptations of their works by the general public. Copyright law forbids the creation of such derivative works without the explicit permission of the author, irrespective of whether these are produced for profit or not. This is done to protect the author's interests, but in the face of widespread online copying and remixing of works (with or without author consent), and with significant recent indications that the music industry is gradually moving away from technical protection measures¹, we must ask these questions:

- How can we protect authors' interests in the age of participation and how can we optimally balance private interests against the interests of a society that is increasingly depending on open access to information?
- What happens to all the content that is copied and remixed online? What is the value-add, if any, in cultural or in economic terms, of such activities? And do users respect the licenses of authors who tend to license their works more liberally?
- How can we engineer communities of digital media producers based on mutual trust and incentive structures leading to socially and economically desirable behavior?

A lot has been written on the use of open licenses and open standards for the production of software or digital content. A collection of related writings is provided in [3], while [4] provides several examples of collaborative, user-driven innovation, with an emphasis on software and physical goods. A more generalized treatise of peer-based production and its potential for the transformation of our culture and society is given in [5]. The power of remixing as a vehicle for creative expression is beautifully expressed in [6], although there are no quantitative analyses that we are aware of illustrating this power in practice.

For our study we use tools developed for social network analysis (SNA) [7], a field that is growing in importance and applications as the Web is becoming increasingly 'social' and 'participative'. For the visualizations presented herein we use the Netdraw application [8] developed for the visualization of social networks. A social network is a graph consisting of nodes typically representing individuals or organizations and edges representing ties between them. Ties are derived often from explicit relationships between individuals, as evident in patterns of (usually verbal) communication, i.e. emails, forum posts, telephone calls, etc. Several techniques have been developed for the study of such networks and while there are many traditional sociological and organizational behavior applications of SNA (e.g., to identify social cliques, professional networks within a firm, or between firms, etc.), SNA has also been successfully applied to the study of other types of 'networks', and of particular relevance to our study are what we may call *attribution networks*, as they are defined by some form of explicit attribution (e.g., scientific papers citing prior work, patents citing related inventions, etc.). A collection of key articles on SNA, with examples of several applications, including some related to 'attribution networks' is given in [9]. Another related application of SNA is the study of *affinity networks* [10] where implied ties between individuals are discovered through the mining of user data for similarities in people's activities or in their profiles.

Our study is also focusing on indirect relationships created through the citation of prior work rather than on direct communication. However, the links we study are not formed just by simple attribution, but by the actual incorporation of parts of somebody's creative work into a new work (through remixing, or, more generally, reuse). Our hypothesis is that such links create a unique type of tie between individuals, and perhaps create *stronger* ties, compared to simple attribu-

¹ Recent Apple/EMI announcement of DRM-free iTunes Plus downloads and Amazon's new DRM-free MP3 store.

tion/citation, as the process of remixing of a creative work is much more involved than the process of making a citation in an academic paper, and furthermore, the actual works are vehicles of personal expression and thus, one may argue, more particular to the individual, more *personal*, compared again to an academic paper or a patent.

Although not related to social networks², content-wise, the only visualization that we are aware of that is closely related to the network diagrams we present herein, is the one produced by Jesse Kriss³ to illustrate the process of sampling in the recording industry. The visualization shows a timeline of original recordings and a timeline of albums with samples. When the user clicks on a newer album with samples the links to all past recordings which were sampled for this album is presented, even at the level of individual tracks on the album. The visualizations we will present are static and not interactive, but provide an overview of all links created between earlier and newer works and across more than one generation of remixing. We are also able to produce visualizations at the level of authors and not only of songs or albums. We have also taken snapshots showing the evolution of the social network over a longer time period.

We introduce the concepts of a reuse network, reuse depth and reuse breadth, to organize and characterize relationships created through the process of remixing within a community. We further provide some of the first visualizations of our contemporary remix culture and initial thoughts and observations on two different views of a reuse network, the content view and the author view. We show that reuse spans multiple generations of works and has the potential to at least double the output of a community, although the propensity to reuse decreases rapidly with the breadth and depth of reuse, so there is a balancing force between original works and adaptations. Extrinsic incentives, as introduced through competitions, can boost the output of authors and attract more authors to a community, but may not be as valuable in the long run as most competition works are never used again and most new authors appear to limit their participation to the time-frame and scope of the competition. Also, we can provide evidence for the existence of power laws in reuse networks, which, if confirmed, would have interesting normative and positive implications for the understanding and design of online communities that rely on the reuse of prior work.

Short Bio

Giorgos Cheliotis is currently a visiting Assistant Professor at the School of Information Systems, Singapore Management University (SMU). Earlier he was a researcher with IBM Research and a management consultant with McKinsey & Company in Switzerland. Giorgos received his PhD from the Department of Electrical Engineering and Computer Science of the National Technical University of Athens, in collaboration with the IBM Zurich Research Lab. Giorgos is well known for his work on bandwidth trading and Grid economics as well as his investigations into new licensing and business models for digital media. Giorgos has initiated and is leading the CC-Monitor project at SMU, in collaboration with the SMU Law School and the Creative Commons headquarters in San Francisco. He is an associate fellow of the Center for Asia Pacific Technology Law and Policy (CAPTEL) at Nanyang Technological University, a leading member of the Creative Commons Singapore and a member of the ACM, INFORMS and ISAST.

² For a collection of visualizations of networks of various types, including social networks, see <http://www.visualcomplexity.com>

³ The History of Sampling, visualization by Jesse Kriss, available at <http://jessekriss.com/projects/samplinghistory>

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