

Harnessing the hackers: The emergence and exploitation of Outlaw Innovation

Stephen Flowers*

Centre for Research in Innovation Management (CENTRIM), University of Brighton, United Kingdom

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Abstract

This paper will explore how the often illegal activities of hackers (employed in the original usage of the term to refer to individuals who modify computer hardware and software) may produce valuable innovations. The paper argues that structural changes, including a growth in the number of knowledge workers, has resulted in a burgeoning community of users able to modify or hack existing products, or develop products that compete with existing suppliers. The paper will introduce the complementary concepts of Outlaw Innovation and the Outlaw User, locating them within the literature on users. The paper will explore how firms react to this activity and provide case studies of this phenomenon. The paper will argue that Outlaw Innovation represents an extension in our understanding of the way in which firms interact with users, presents a series of policy challenges, and opens a promising area for further research. A series of possible research questions will be outlined and the paper will conclude by indicating the next steps in the development of this line of enquiry.

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1. Introduction

Good ideas are found in many places and firms will routinely draw on a range of sources, both internal and external, as part of their innovation process. Structural changes, including the growth in the number of knowledge workers, has led to innovation becoming ‘democratised’ (von Hippel, 2005) or ‘Open’ (Chesbrough, 2003). Firm innovation may now require novel and evolving relationships with a large number of external actors whose ideas may be bought, licensed,

or else are freely revealed. However, in addition to these more established sources of innovative ideas firms are now seeking to exploit the innovations that emerge from the often illegal activities of a particular form of user—the hacker.¹

Although the potential for users to provide new ideas and indicate future market trends is well understood (e.g. von Hippel, 1986; Kline and Pinch, 1996; Thomke and von Hippel, 2002; Kline, 2003), often implicit in this established view is the existence of a cooperative and consensual relationship from which both user and supplier will seek to benefit, facilitating a free flow of

* Correspondence address: Centre for Research in Innovation Management (CENTRIM), Freeman Centre, University of Sussex, Falmer, Brighton BN1 9QE, United Kingdom. Tel.: +44 1273 877933; fax: +44 1273 877980.

E-mail address: s.h.flowers@brighton.ac.uk.

¹ It should be noted that the use of the term ‘hacker’ is not applied in the pejorative sense, but rather to refer to individuals who create and modify computer hardware and software.

information between the two parties. But this is not the only kind of relationship that may exist and this paper will examine innovations that arise from attempts to: amend a product's functionality or in some other way extend or distort the intentions of the original designers; exploit design flaws in order to attack or evade security systems; or create systems or services of dubious legality in order to compete with mainstream commercial firms.

These activities may violate intellectual property and pose a direct threat to established suppliers with the result that the work will often be underground in nature, operating either anonymously or with those involved seeking to obscure their links to such activities. Within this milieu, innovations will emerge from non-cooperative, non-consensual relationships in which the user may be unknown to the supplier and in which there is likely to be no free flow of information between the two parties.

This paper will propose that such activity, at least within IT-intensive digital industries, is widespread and often operates in parallel with mainstream use in this area. It will argue that such Outlaw Innovations may be adapted by firms and supplement mainstream innovation processes, directly impacting on firm R&D, and potentially leading to new or improved products and the creation of new markets. The paper will introduce the notions of Outlaw Innovation and Outlaw User, locate these concepts in the innovation literature, provide examples of this phenomenon, and explore the implications for firm innovation processes and policy. The approaches that firms employ in response to such activity in order to either resist or benefit from the innovations that Outlaw Users generate will be outlined, and the paper will explore how the challenge presented by Outlaw Innovation can act to supplement in-house innovative activities.

The paper is structured as follows: Section 2 will explore how the role of the user has been discussed within the innovation literature and introduce the concepts of Outlaw Innovation and the Outlaw User; Section 3 will present a series of case studies that examine Outlaw Innovations and explore firm reactions to such activity; Section 4 will introduce a preliminary taxonomy of Outlaw Users and explore the implications for policy and our understanding of the role of the user in innovation; Section 5 will present brief conclusions and outline a series of questions to guide further work in this area.

2. Innovation and the user

Innovation is a cluster of processes that takes new ideas and moves them into widespread application. It will typically involve design, manufacturing and marketing of a new (or improved) product (Freeman, 1982),

that may be either a radical or incremental improvement on the state of the art (Gardiner and Rothwell, 1985). In the case of industrial innovation, such activities have traditionally taken place within firms which often have large internal R&D facilities organised around such work (e.g. Xerox Parc, Bell Labs, the Thomas J. Watson Research Laboratory at IBM). It has been argued that this approach, now known as closed innovation, no longer reflects the way in which firms will utilise ideas sourced externally and that may have originated in other firms. This view, termed open innovation (Chesbrough, 2003), is a recognition that firms may no longer rely on their own R&D efforts and may buy or license ideas from other companies. In this context the boundary between the firm and other external actors becomes far less distinct than in the closed innovation model, with firms able to draw on a variety of external sources of R&D as part of their innovation strategy. Although such external sources are generally understood to include such things as firms, universities and joint ventures, this paper will explore how firms seek to exploit ideas obtained from Outlaw Innovation.

Within this discussion a key distinction exists between invention, the development of a good idea, and the process of bringing that idea into widespread use, innovation. This has sometimes been referred to as the process of commercialisation (Teece, 1986), although this view is limited as it ignores a wide range of innovative activity that is non-commercial in nature, but which bring new ideas into wider use (e.g. public sector innovation, open source innovation). It is argued that Outlaw Innovation is another such non-commercial activity that falls outside this narrow definition but, as we shall see, is a potent means by which novel ideas are brought into widespread application.

2.1. The user

The term 'user' can be problematic as its meaning largely depends on context and the tradition of the literature within which it is employed. For example, within the innovation studies literature the term 'user' generally takes an upstream, supplier-centric, perspective and in this context the 'user' (e.g. lead user, final user, user innovation, learning by using) tends to be at the level of the firm. As a result the user tends to be examined as an adjunct to supply side issues like product development and market demand. For example, users have been characterised as consumers whose needs must be understood for a product to stand any chance of being a commercial success (e.g. Rothwell et al., 1974). It has also been recognised that the expertise and experience of certain

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