Artificial Intelligence, Personalised Medicine and Intellectual Property Rights: Openness Revisited

Personalised medicine (PM), big data and Artificial Intelligence (AI) are closely interconnected. Personalised medicine develops solutions particular to the biological profile of specific patient groups or sub-groups. For PM to achieve this, it needs big data and AI. Powered by AI, the hope is that Big Data will reveal patterns in patient records, scanned images or even data stored on mobile phones to improve diagnosis of patients, assist in their the treatment, and even change the process of discovery of new drugs.

Given the extraordinaire possibilities and potential dangers a plea to design AI for good is currently promoted by scientists, governments and even private companies. **The paper grapples with the following research question**: How is the idea of openness, the concept of innovation and IP rights relevant to this debate? As Bostrom[1] notes, openness in AI innovation can take a variety of forms: openness in algorithms, datasets, or ethical values. In other words openness points to the limits of intellectual property rights such as trade secrets and patents and invites us to think in terms of both more collaborative ways to manage valuable resources and design governance systems that permit public foresight and societal input.

Contributing to this debate, **the research objective of the paper** is to discuss law's distinctive way to understand openness, which differs from scientific openness (a concept used in the field of philosophy and social studies of science), and open innovation (concepts used in management and innovation and science policy studies). The law perspective differs in that it has the conceptual tools to question whether openness will actually inevitably benefit creative endeavors and democracy.[2] Indeed, as the paper explains openness can be exploited by pharmaceutical companies and companies such as Facebook and Google which are in the business of collecting data. These companies will benefit enormously from the emerging data infrastructure funded by public money, a phenomenon that closely relates to the new 'platform capitalism.'[3]

In light of the above, the paper further argues that the legal perspective on openness brings out the often overlooked relationship between the 'open' and 'closed' or what is shared and what is private. Building on the idea of the 'romance of the public domain',[4] the main thesis of the paper is that the open and the proprietary behave like communicating vessels; coming to grips with openness needs a thorough understanding of the adjacent system of private rights. To this effect, **the paper uses legal and policy document analysis (qualitative methodology) and legal analysis** to propose two different typologies based on case studies. The first is taken from patenting practices of pharmaceutical companies and companies such as 23 and me. Openness, I argue, seeks to facilitate the flow of information in the emerging data superhighway necessary for the commercial development of data-driven medicine However, the strong trade characteristics of openness give rise to adjacent rights that are very broad, they favor strong exclusivity, and they are hostile to redistribution (Sideri, forthcoming).[5] I will contrast this with a model of openness that is based on open source or university licensing that promotes distributive justice concerns (using theoretical work by Ghosh and Benkler).[6] Private rights and openness interweave and both serve to promote cultural production.

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[1] Bostrom N., 'Strategic Implications of Openness in AI Development' *Global Policy* (2017) 8/2: 135–148.
[2] Chander, A. and Sunder, M. (2004) 'The Romance of the Public Domain' *California Law Review* 92/5: 1331-1375.
[3] Mirowski P., (2018) 'The Future(s) of Openness,' *Social Studies of Science* (2018), 48(2): 171–203.
[4] Note 2 above.
[5] Sideri, K. (forthcoming) 'Data Commons, Patents and the Concept of Openness in Data Driven Medicine: Private property, public property and the high price of treatments' *Science and Public Policy*.
[6] Benkler, Y., 'Peer Production and Cooperation,' forthcoming in J. M. Bauer & M. Latzer (eds.), Handbook on the Economics of the Internet, Cheltenham and Northampton, Edward Elgar; Ghosh S. *Identity, Invention, and the Culture of Personalized Medicine Patenting* (Cambridge University Press, 2012).