

Success and geography the weightless economy: Evidence from open-source software

Abstract

Open-source software (OSS) is a global, vast in scale, and extremely successful industry with millions of developers and millions of packages produced and with almost all software including OSS code. How can groups of independent and geographically dispersed producers work together and create globally used products? This paper describes the relationship between product success (adoption of software) and the geographical dispersion of its producers. Focusing on the largest language, JavaScript, we analyze contributions by 217 thousand developers in 300 thousand projects with 78 thousand unique projects imported as intermediate goods (called a dependency). We find that while OSS developers will collaborate more intensively when in close proximity, more widely adopted software packages are written by a more spatially diverse group of developers. We show that this is not driven by the geography of adoption, as developers only marginally prefer locally written packages as intermediate input (dependency). It is not driven by talent distribution across cities either. One explanation is self-selection of coders: where best coders can get access to global pool of talent and pick partners. While most coders are independent, some will have formed organizations -- communities of developers working on a group of projects independently or as part of a company. Organizations are found to reduce spatial frictions for collaboration. We discuss possible reasons behind these findings including face-to-face communications and institutions.

This paper is joint work with Julian Hinz, Miklós Koren, and Aaron Lohmann.

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