

# Why Does RePEc Persist?

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**Abstract.** RePEc is one of the largest open access digital libraries in the world. It has been developed and is maintained almost exclusively by non-paid volunteers. The paper explores the heterogeneous actors and their different motives for participating in RePEc using the concept of ‘translation’ from actor-network theory.

## Introduction

While surveying the research on open source software Rossi (2004) asked for more research to provide an explanation of how the heterogeneous motivations guiding the behaviour and incentives of the different actors involved integrate coherently. This paper explores these issues not in the context of an open source project but within a digital library. RePEc is a collaborative effort providing access to working papers and journal articles in economics. The creation and ongoing maintenance of RePEc involves work by several hundreds of volunteers. First the theoretical framework – actor-network theory – is presented. Then the incentives in RePEc are explored and questions for further research are presented.

## Actor-Network Theory

Actor-network theory (ANT) is known as one of the most controversial theories among social science theories (Latour 2005). ANT has its origins in the social studies of science where it was developed and used to explain the social construction of facts and how activities in laboratories were made to travel far beyond the laboratories (Latour & Woolgar 1979, Latour 1987, 1988). ANT has

also been used to study the creation of actor-networks in non-laboratory studies. Callon (1986) used ANT to study how fishermen, scientists, scallops, etc. interacted to temporarily form an actor-network and Law (1986) studied how the Portuguese managed to navigate to India and back.

An actor in ANT is anything made to act. By 'granting' agency to non-humans ANT differentiates itself from other social sciences where the social is reserved for humans only. The research methodology of ANT can best be described with the slogan *follow the actors*. It is the task of the researcher to follow the actors and record the controversies, definitions, and actions without any a priori theoretical framework. One could say that ANT is ethnomethodology extended to non-humans. Callon and Latour (1981) explored the creation of actor-networks and one of their main points is that actor-networks are not 'purely social' in the traditional meaning of the term social. By comparing baboon societies to human societies they argue that more than purely social ties are required to maintain a human society. They argue that baboons are constantly involved in maintaining their society with nothing more than their bodies. However, humans need to bring into play associations (*i.e.* technology) that last longer than the interactions that formed them.

The most well known ANT concept is *translation* and actor-network theory is also known as the *sociology of translation*. Callon (1986) described translation as a process during which the identity of actors, the possibility of interaction and the margins of manoeuvre are negotiated and delimited. Law (1986) has labelled the act of translating *heterogeneous engineering*. Callon and Latour (1981) described translation as "... all the negotiations, intrigues, calculations, acts of persuasion and violence, thanks to which an actor or force takes, or causes to be conferred on itself authority to speak or act on behalf of another actor or force." Translation then is the process of creating an *actor-network*, which is never complete and may very well fail. All actors in the actor-network also participate in the definition of the actor-network. Hence, the initial translator may find that the resulting actor-network has little resemblance with what she originally had in mind. The heterogeneous engineer doing the translation tries to become indispensable to other actors and insert herself as an obligatory point of passage. An obligatory point of passage must succeed to speak for others and as noted by Callon (1986) "*to speak for others is to first silence those in whose name we speak*".

If a heterogeneous engineer succeeds in translating the actor-network, it is stabilised and may *converge* and become *irreversible* (Callon 1991). Convergence measures the extent to which the process of translation leads to agreement and co-ordination in the actor-network. Irreversibility is the extent to which it is impossible to go back to a point where that translation was only one among others and also the extent to which it shapes and determines subsequent translations. When the actor-network is stable it starts to behave and be treated as one entity

rather than a heterogeneous network. This way the actor-network is turned into a *black box*. A black box contains that which no longer needs to be considered. A macro-actor (an actor-network that behaves like an actor) grows by adding/associating actors to herself and simplifying them into one black box. According to ANT, power is the results of translations and must be seen as consequence and not as a cause (Latour 2005). Power is performed within an actor-network by inventing means that (a) render actions, events and facts *mobile* so that they can be brought back; (b) keep them *stable* so that they can be moved back and forth, and (c) are *combinable* so they can be aggregated. The actor that is able to do so will be able to create a *centre of calculation* (Latour 1987).

## RePEc Problematized

RePEc collects metadata about working papers and journal articles from its participating archives and makes all metadata searchable mainly through the two interfaces IDEAS and EconPapers<sup>1</sup>. Most users probably do not know much about the way RePEc works, rather they will just search IDEAS or EconPapers the same way as they would search for example in EconLit<sup>2</sup>. Over the years RePEc has grown from a relatively small digital library into one of the worlds largest freely available digital libraries. RePEc has seen a steady growth in the number of documents added as well as the number of downloads. The infrastructure needs to be constantly maintained and developed. This does not come about all by itself but requires work by hundreds of volunteers. RePEc is currently doing very well. But that is precisely the problem. How can everything be going just fine when RePEc has;

- No formal organization or legal incorporation; there is no RePEc Inc. nor is RePEc registered as a non-profit organisation or a foundation.
- No revenues, nor expenditures, and no budget; anyone can use the services RePEc provides for free. The software and hardware used to run RePEc is located at different universities and the time spent by the people involved is not charged for.
- No staff; the closest one comes to staff is one programmer financed by a grant to work on a general version of the software used to run the RePEc Author Service.
- No contract or other legal agreements of any kind, tying neither individuals nor organisations to RePEc.

Seen this way RePEc does not seem to be much of an organisation. But then again the numbers of volunteers and users tell a different story. This apparent paradox is what will be explored in this the following sections.

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<sup>1</sup> <http://ideas.repec.org/>, <http://econpapers.repec.org>

<sup>2</sup> The bibliographical database produced by the American Economic Association

## Exploring the Incentives

This section presents RePEc and explores the heterogeneous motivations and incentives using concepts from ANT.

### The Core RePEc-team

There are about ten to twelve core members in RePEc. Most of them spend a considerable amount of time working with RePEc making sure that the services IDEAS, EconPapers, NEP, RAS, and LogEc are up and running. The team consists mostly of economics professors and it is remarkable that they find it more rewarding to spend time working with RePEc rather spending it on research or teaching. One could certainly explain a certain degree of *pro bono* work but the effort expended on RePEc goes well beyond this. Not only does the RePEc-team spend their time on RePEc but they have also managed to enrol computer equipment and other resources.

### Archive Maintainers

RePEc manages to convince institutions (mostly the departments of economics at universities, central banks, etc.), and publishers to contribute metadata to RePEc. In return for the metadata RePEc offers participating archives exposure to users. Here both those who do not charge for their papers as well as those who do benefit from the increase in attention. Maintainers work mostly independent of one another and of the core RePEc team in a very modular fashion. Most archives are maintained by one person and since there are close to 500 archives there are several hundreds of archive maintainers. In aggregate the archives contain information about more than 300,000 papers. In order to get papers into RePEc all metadata must be formatted in a standardised format. Archive maintainers sometimes fail to adhere to these standards and sometimes archives are just neglected. The core RePEc-team is constantly involved in checking up on archives that fail and ensuring that new archive maintainers are able to do their job properly. Even though there seems to be a clear motivation for institutions to join RePEc it is not known who initiated and set up the archive. Nor is it clear if this initiative came from an enthusiastic individual or if it was a formal decision. It is also unknown how much of an effort the core RePEc-team makes to get new archives onboard.

### The NEP-editors

RePEc offers a current awareness service called NEP<sup>3</sup> (New Economic Papers). NEP provides users with the ability to receive alerts about new working papers added to RePEc. It relies on about 60 editors who each week spend about 15 to 30 minutes browsing a list of some 200 to 300 new working paper abstracts added to

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<sup>3</sup> <http://nep.repec.org>

RePEc. Each editor selects relevant papers that are then e-mailed to the subscribers.

Each month NEP-editors receive an e-mail titled *Size matters*, which includes the number of subscribers of each list. Recent postings on the internal NEP list suggest that editors also work hard to market their reports as well as trying to keep people subscribed by tracking down invalid e-mail addresses. This is done without any compensation to the editors and one should keep in mind that editing a NEP-report is not at all as prestigious as being an editor of a journal. NEP-editors are professors, associate professors, and doctoral students. It is currently unknown what motivated them to become editors and do what some would consider boring and unqualified work. Furthermore, it is also unknown what makes editors leave their positions and how much is done by the core RePEc-team to enrol editors.

#### NEP-subscribers

There are more than 15,000 unique subscribers to the 66 NEP-reports. Together they account for more than 36,000 subscriptions. The biggest NEP-report has more than 2,500 subscribers while the smallest has slightly more than ten. Subscribers only have to go through a fairly easy process to sign up to the NEP-reports they want. NEP-subscribers use RePEc and by their sheer size they add weight to both RAS and RePEc. Here again, little is known about how subscribers come across NEP.

#### Users of IDEAS and EconPapers

What is true for NEP-subscribers is also true for those using IDEAS and EconPapers to search for and download papers. However, their number is most likely larger and the effort smaller. The number of users is not known but they downloaded some 340,000 documents in June 2005. Since statistics started being kept a total of 13,000,000 documents have been downloaded. This collective use adds power and credibility to RePEc the same way NEP-subscribers do.

#### RePEc Author Service (RAS)

RePEc includes RePEc Author Service (RAS<sup>4</sup>). RAS enables authors to create a page where they claim authorship of documents in RePEc. This becomes something similar to a homepage and online CV. So far RePEc has managed to convince 7,500 researchers to sign up. Authors receive a monthly mailing, which includes statistics on downloads of an author's papers. Additionally, there is a ranking system for registered authors. Little is known about how economists relate to RAS, but the amount of economists signed up gives an indication of its success. Another indication is that many of the most prestigious economists have signed up.

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<sup>4</sup> <http://authors.repec.org/>

LogEc

LogEc tracks the number of downloaded papers per service (NEP, EconPapers, IDEAS) and is also able to provide individuals and archives with statistics. LogEc is RePEc's centre of calculation. It brings together the dispersed actions of all users and aggregates and simplifies them so that they can be used elsewhere. The role and importance of the statistics to different actors is unclear.

## Preliminary Observations and Challenges Going Forward

The actor-network known as RePEc has evolved through a series of translations that have turned it into a black box. RePEc has also managed to establish itself as an obligatory point of passage for large number of different actors – of which but a few have been presented in this paper – and manages to speak on behalf of these. It seems that actor-network theory is a suitable tool for explaining the apparent paradoxes and incentives of the translated actors and in turn explaining why RePEc persists.

At this point it is clear that RePEc has several characteristics in common with open source software projects. These include *the way participants are distributed* over many geographic locations and across many organisations. Also the *size of contributions by individuals in different groups* is inversely related to group size. Furthermore open source software is usually split into modules. In RePEc archives and services can be seen as *modules*. Hiding the complexities and standardising the interaction between modules reduces the number of interdependencies between modules (Langlois 2002). Learner and Tirole (2001) noted that modularity permits a very decentralized and uncoordinated mode of production. Finally, *users have an important role* although they do not directly contribute to the project. But, by their very existence they do contribute to the size and prestige of the project making it easier to recruit contributors that are more involved (Ye & Kishida 2003). However, one should not jump to the conclusion that the kind of organisations described here are limited to projects carried out on the Internet. The interested reader should note the remarkable similarities with the management of Berkley's Museum of Vertebrate Zoology as reported by Star and Griesemer (1989). Going forward it seems that research into these types of organisations can greatly benefit organisation theory. Challenges include designing methods for researching heterogeneous groups of very different sizes.

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