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When Digital Technologies Migrate: Innovation from an Anthropological Perspective

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ABSTRACT

Nowadays, digital technologies are revolutionizing innovation processes, as they are multiplying the production of novel solutions, and they are spreading those solutions to people all over the world. In this paper, I focus on the analysis of digital technologies' migration, in order to rethink innovation both in production and diffusion terms. I argue that innovation is a complex process that happens in different ways, and in different moments and places. Using a varied set of ethnographic examples taken from the anthropological literature, I show how the intention and the logic through which digital technologies are created as innovations also migrate. This innovation logic can be contested, as digital technologies are repurposed in different contexts, and digital technologies can even be the spaces where these different sorts of innovations happen. I conclude by suggesting that an anthropological contribution is precisely to show the volatility of innovation as a concept.

Introduction

The aim of this article is to examine the implications of travelling digital technologies as part of various innovation processes.[1] This is important because, as historian Patrice Flichy notes, analysis of technological innovation through a social sciences lens focuses either on the design/production, or in the spread/use of the object after it is produced (2007, p.vii). What happens, then, if we create an analysis that takes into account both, in order to understand the spread of digital technologies into different cultures?[2] And even more, what would this analysis look like if we include the specificity of digital technologies in that production-use approach? My argument is that such analysis is useful to understand innovation in a more complex way, in the sense that innovation is composed of multiple processes in different moments and places. In other words, digital innovation involves design, but it also involves appropriation and re-use (thus, another type of innovation) when it travels. Furthermore, if we take seriously the specificity of digital technologies to be re-edited and re-ordered, then we would also need to argue that digital technologies themselves become a 'space' for negotiating the emergence of even more innovations.

My analysis will be mainly anthropological, since anthropologists have long tried to show that what may appear to be 'innocuous' movement (of people as well of things) generates further implications in the social world. Specifically, my analysis is based on Elizabeth Povinelli's (2011a) term of "embagination". With this concept, the author suggests that social worlds – what other authors call networks or systems – are at the same time solidifying (acquiring shape) and emerging through movement and circulation. In Povinelli's words, "Routes figurate space" (2011a, p.5). Established routes of intercultural exchange are the elements of social worlds through which other elements of those worlds (institutions, rituals, infrastructure, and so on) are created and woven into each other (like a bag), but at the same time, those routes are the slits through which further elements

[1] As the reader will note, the sole objective of this paper is to rethink the definition of innovation and where it happens. However, what is certain about my definition of technological innovation is that it is not only referring to the product as such, as it is involving several actors, processes, and social relations, that can have outcomes different to the product itself.

[2] I define culture as "the way people draw analogies between different domains in their worlds" (Strathern, 1992, p.47). Culture is the way people draw together the artificial and the natural, the social and the material, the economic and the political, and so on. I use this definition because it goes beyond national and heritage boundaries, and can apply to other contexts such as organizations or expert communities. However, I do recognize that my framework focuses mainly on Western and non-Western boundaries, as my paper is limited to anthropological research and this discipline has historically used this distinction as its leitmotiv. The implementation of this framework into other sorts of boundaries (experts to laypeople, for example) would be an interesting topic for a future paper.

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can emerge (like the opening of the bag). Abstract as it is, this theoretical framework is useful because it allows us to understand that a digital (or non-digital) innovation is both what it was thought to be by its creators, and what it can (and will) become when it is circulated in different places.

Even though I have used terms such as movement and circulation, I prefer to use the word 'migration' from here-on, because it evokes specific stages in the process of movement: it is arriving to point B from point A (arrival), but it is also packing luggage in point A (departure), and passing through a border between A and B. Therefore, the structure of this paper will play with this basic definition of migration. In departure, I will show that there are specific ideas and relations travelling with digital technologies. In arrival, I will analyse how the re-use of the same digital technologies contests those established logics that travel with them – therefore, innovating through technology in a different way. In border, I will suggest how digital technologies become a space where innovations also emerge. In all three parts I will use a varied set of ethnographic examples taken from anthropological literature: gambling machines, internet forums, social media, and indigenous databases (amongst others).

Departure: Travelling Logics

We cannot understand a specific technological (or other type of) innovation without taking into account social dynamics, cultural backgrounds, organizational processes, and human (and non-human) actors involved. As Flichy (2007) argues, "the innovative process consists in stabilizing relations between the different components of an artefact, on the one hand, and between actors of the technological activity, on the other" (2007, p.155). So, what are the implications of this idea of digital innovation depending on socio-material networks? In this first stage of the process of migrating digital technologies, I suggest that digital technologies are migrating alongside the logics and intentions of their creators, and thus, a specific type of innovation is travelling as well.

Sociologist Bruno Latour (1988, 1991) explains the condition of any technological artefact (from a door-closer to the first daguerreotype) of carrying logics and social relations through the concepts of inscription and black-boxing. For this author, technology is a tool to which we delegate specific tasks, and through which we translate specific intentions in a durable way. In other words, a door-closer is replacing someone in charge of opening and closing doors, and at the same time it is translating the imperative 'keep the door closed' (Latour, 1991, pg. 300). This is what Latour calls "inscription": a translation that "goes from a provisional less reliable one to a longer-lasting one" through objects (1991, p. 306). Furthermore, this goes beyond a simple one human-one object linear relation, as it can involve several human and non-human actors – as a sort of chain or network. The innovation of Kodak cameras, using Latour's (1988) example, involves several human actors including different sorts of inventors and publics, but also different objects such as patents and prototypes (Latour, 1988, p.110-113). The problem is, precisely, the characteristic of technology that Latour (1988, p.110) calls "black-boxing": by examining the finished product, we cannot see that chain of human and non-human actors that ended up in the development of that innovation. By translating intentions and delegating tasks to technologies, objects are transporting those as a black box.

Natasha Dow Schüll's (2014) ethnography of gambling addiction is a useful example of Latour's concept of inscription. Dow Schüll shows how digital gambling machines are transporting an ideology (profit increase) through the design of specific modes of interaction between machine and users, accompanied by the spatial arrangement of lights, decorations, pathways, and walls. This inscribed idea constrains the actions of the 'user,' and builds their subjectivity in specific ways (2014, pp. 17-21). The problem of addiction, then, is not a consequence of deviant individuals, but more of a distributed agency in which machines, gamblers, designers, and spaces are involved in the problem. As a rather extreme case, Schüll's ethnography shows how certain imperatives of control are being inscribed on digital technologies. For many anthropologists, then, a cultural and socio-material approach to innovation processes means that technology is not only caused by social and material relations, but it carries social and material relations as well.

If on the one hand Latour or Dow Schüll focus their analysis on this capacity for inscription as something that digital and non-digital technologies share, then there are other anthropological perspectives that focus on the specificity of digital technologies to arrive to a different conclusion: digital technologies' characteristics are precisely to be opened and changed. Kallinikos et al. (2010) propose a set of properties – openness, interactivity, editability – that make digital objects malleable in a way that their structural properties can be accessed and modified, thanks to their numerical property (binary code). Digital technologies, we may say, are designed to be redesigned.

Nonetheless, we might also say that this idea of opening and re-opening is a situated idea, and it is travelling with migrating digital technologies. In other words, digital technologies respond to a specific cultural logic of what the society should be and how to achieve this. In his ethnography about the 'cultural logics' of Free Software, Chris Kelty (2008) proposes the concept of "recursive publics" to show how the development of Internet and the Open Source Software Movement (OSSM) are simultaneous and related. With recursive publics he means that moral orders and discourses of freedom and openness cannot be understood without the technical practices and the material infrastructures that sustain it (p. 9). Thus, the Internet has been both developed through these ideas of what the public is and should be, and allowing its existence at the same time. The idea that the Internet (and digital technologies in general) are

open and free comes from a very specific moral stance from liberal and libertarian 'geeks' from Silicon Valley and other Western technological centres. If Western libertarian morals and digital technologies are in a recursive relationship, then it is inevitable that digital technologies carry logics, social relations and intentions with them.

Open as they are, digital technologies also transport ideas. In Leach and Wilson's (2014) words, "technological innovations (...) embody, reify, and articulate social relations" (2014, p.191). As we have seen, digital technologies are black-boxing (Latour, 1991) and white-boxing (Corsín Jiménez, 2014) at the same time: they are leaving their components open to editing possibilities, but they are closing (and sustaining) the processes and relations that configured them like that in the first place.

Arrival: Appropriations and Emergent Innovations

In the last section, we have seen that cultural, social and material elements are mobilized by various actors in order to generate technological innovation – a product to solve a specific problem or need – but also that the logics, intentions and relations blackboxed in that product travel with it. However, anthropologists have long ago examined how an object's produced status of 'commodity' change throughout its social life (c.f. Kopytoff, 1986). In other words, they have shown how what we consider to be an established status of an object (say, a good or a commodity mass produced and only designed to be bought, used, and discarded), acquires other types of status and uses during its life cycle – they can become gifts, sacred objects, or be recycled. In this section, then, I suggest that this technological black-box does not necessarily continue when digital technologies travel, as other innovations can emerge when they are appropriated.

Daniel Miller and Heather Horst (2011) use the term "proliferation of difference" to understand this changing condition of digital technologies. They start their analysis by defining the digital as a process of translation into binary code. Next, they compare this process with money: as abstractions, they are modern efforts to simplify social life and create a universal framework of measure. However, the authors use Hegel's dialectics to argue that these abstract universals bring the possibilities for multiple particulars. In other words, they propose an analytical stance in which we (as analysts) should focus on the ways "digital technologies are proliferating a vastly increased field of cultural forms" (2011, p. 6). Miller et al. (2016), for example, use the concept of 'polymedia' to show the shift that digital media has brought, in which people are able to scale their communication practices from private to public, and from individual to group, through the use of different platforms. However, they argue that this should lead us to study social media as social phenomena that is appropriated, and thus changing, within different cultural contexts and through different processes of sociality. In short, they are showing how digital technologies also afford new uses and are changed by those as well.

So what does it mean, in practical terms, that digital technologies afford new uses? It means that it is possible to change the main need that a technological innovation was designed to solve, as well as the logics and intentions that travelled with it –what is commonly understood as appropriation or conversion (Leach and Wilson, 2014). Alberto Corsín-Jiménez' (2014) ethnography of open software and hardware in Madrid depicts this process. Through the concept of "the prototype," Corsín-Jiménez shows how digital technologies' properties of openness and editability can be actively used to allow grassroots projects to transform Madrid's infrastructures. Playing with Latour's concept of black-boxing, Corsín-Jiménez argues that Madrid's grassroots projects are "white-boxing" innovations: they take a finished innovation (say, a bicycle designed to transport heavy loads), think how it was designed (reverse-engineer), and then create a digital 'how to build' guide to find out the ways that innovation can be reproduced and changed. Corsín-Jiménez shows how the appropriation of the Open Source Software Movement (OSSM) ideas and procedures into urban design projects helped grassroots initiatives to appropriate the parks, plazas and roads of Madrid. Thus, digital technologies are prototypes in the sense that they are always open to new transformations, and can help other objects to become prototypes as well. Through the re-uses of both digital technologies and non-digital artefacts, people can solve needs that were not anticipated by the creators of those technologies.

Digital technologies can even be appropriated to challenge the idea of freedom and appropriation itself. In other words, people also use digital technologies to challenge the libertarian ideas that come black-boxed with them. The case of Mukurtu, the digital archive developed by Kimberly Christen (2012) in collaboration with Australian aboriginals is revealing in that sense. As Christen noted, celebratory discourses of openness and freedom that come with open source technologies are, ironically, oppressive to aboriginal ideas of information access and circulation. Thus, by creating a binary of information freedom (as something good for humanity in general) against closure (as something good only for companies and their own interests), they are reproducing the colonial past of theft and silencing aboriginal cultural knowledge (2012, pp. 2872-5). Through a digital archive in which 'cultural protocols' are in-built in the code so that they protect the access of certain information to outsiders, they were trying to expand the notion of openness without appealing to universal goals (p. 2889).

Taking into account the ethnographic examples of Corsín-Jiménez (2014) and Christen (2012), we can say that digital technologies can be re-used in the sense that people both replace or directly challenge the logics and intentions that come with them, by adapting them to their locally-specific needs. In that sense, we can also say that there is a second process of innovation, that is subsequent to the innovation process that generated a digital technology in itself. Authors such as James Leach and Lee Wilson (2014)

suggest the concept of "exaptation" to define this second process of innovation, as it looks more like a remix than a carefully planned and staged process: "structures that may have evolved for one purpose are co-opted for quite different functions for which they happen to come in handy" (Ingold, 1997 in Leach and Wilson, 2014, p.17). Even if digital technologies are a network of inventions and planned processes and functions, they can also become tools for improvised re-use and adaptation.

At the Border: Digital Technologies as Spaces of Innovation

So far, we have seen that digital technologies are part of a complex set of relations that compose innovation processes in terms of production, and even if we assume the openness of digital technologies, that set of relations travels with them. Then, we have seen that when digital technologies migrate, they also become part of another innovation process in terms of use: digital technologies are transformed, remixed, or re-thought through locally-specific needs and locally-specific cultural logics. In this last section I focus on what happens at the border – that is, when those culturally-different logics and parallel innovation processes meet. Furthermore, what are the implications of the openness of digital technologies in that process? I suggest that digital technologies are not only part of different innovation process, but digital technologies can also generate innovation processes within them.

In order to unpack this idea of innovation within digital technologies, here I come back to the contributions of Elizabeth Povinelli (2011a) that I outlined in the introduction to this paper. Apart from the recognition that moving things create social worlds – "Routes figure space" – Elizabeth Povinelli (2011a, p. 5) notes that the anthropology of exchange and circulation also shows that those routes "are figured by figurated space." She argues that those social worlds (networks and systems) created by the circulation of things are never sealed, and it is precisely through those moving routes that the social world remains open for emerging phenomena (p. 7). Nonetheless, she adds that "no world is actually one world" (p. 7), in the sense that there are worlds between and within worlds. Emergence happens when social worlds exchange or circulate elements between them – when a digital technology migrates from one culture to another, for example. However, emergence can also occur inside one social world – i.e. when digital technologies are used as virtual spaces and people from different cultures interact in them.

Let me exemplify how the interaction between the production process and the re-use process happens, through Fred Myers' (2004) analysis of the commercialization of indigenous paintings in Australia and the controversies that arose around them. He suggests that the paintings and designs are both a) making part of an "art-culture system" in which they circulate; and b) keeping an ontological status of sacrality (p. 7). Controversies arise because indigenous paintings are produced within a context of sacred relations between aboriginal artists, land and ancestors, but are then circulated in a Western context where those same objects are considered as commodities – therefore, indigenous paintings are what he terms "promiscuous objects" (p. 6). However, rather than a cause of incompatibility – two incommensurably different ways of understanding the same object –, from an Indigenous point of view this boundary between regimes of value is not a reason for closure, but for negotiation. Indigenous artists allow their works to become commodities in as much as the buyers recognize the importance of the artist's ancestors and cultural traditions. In other words, the interaction between two innovation processes (one related to production and one related to use) is a constant negotiation in which more processes can emerge.

Coombe and Herman (2004) also discuss the case of a clash between Western ideas of property and indigenous understandings of cultural transmission of knowledge, but this time it happens inside an online forum between Maori activists and Lego fans. The authors analysed how Maori sacred words and terms were appropriated by Lego and used as brands for some of their specific products. This triggered discussions and arguments between Maori activists and Lego fans, because Lego fans were appealing to the 'freedom' of those terms to be used by anyone, whereas Maori activists interpreted that latter argument as ignoring the specific importance of those words in their communities. To analyse this controversy, the authors use the concept of "contact zone" in order to show how the digital world is a social space of negotiation between two cultures separated otherwise, but also "a performative space of the negotiation of emergent identities." (p. 571). The authors argue, then, that the digital world allows the emergence of different responses to "corporate territorialisation of the Web" (p. 570). In other words, digital forums allow the emergence of other ways of understanding digital property that are different to the ones used by the corporations promoting their products in the Web. Thus, the negotiation of different ways of using digital technologies happens within digital technologies as well.

With the last two examples, we have seen the exchange between social worlds (Myers, 2004), but also the exchange of social worlds within digital technologies (Coombe and Herman 2004). Nonetheless, Elizabeth Povinelli (2011b) herself shows us how there are not only exchanges (and their negotiations) between social worlds, but also there are emergent innovations within digital technologies. She does that by analysing a digital archive that she developed alongside Australian aboriginal communities, designers, and Web developers. What they were trying to do with the digital archive was not to escape from the dynamics of digital information (yes/no; if/then) – to look for an 'outside' of digital technologies' binary logic that could better represent Australian aboriginal knowledge and traditions. Rather, the project tried to use a specific matrix of circulation to model a novel form of sociality in it (2011b, p. 160). In other words, they

designed the archive so that the user could not have access to all content; but to access specific elements in the archive according to the user's status, gender, and previous experience with the archive's content – what Aboriginal communities term "acquiring social skin." Thus, Povinelli is showing how digital technologies are not only objects migrating between Western and non-Western cultures, but they also provide a space in which Western logics (it is either True or False; it is either Public or Private) can co-exist with (or be the grounds to) completely different worldviews and social dynamics.

Conclusion

In this paper, I have analysed the 'migration' of digital technologies from a perspective that takes both production and use into account. Digital technologies can be understood as important elements (and products) of many innovation processes occurring nowadays, because they have revolutionized the way we create new interactions with people, objects, and cultures. Therefore, we can also complexify social sciences' ideas of innovation, by complexifying the analysis of digital technologies' migration between cultures – through both perspectives of design and circulation.

In the first part I have explored the ideas of inscription and black-boxing. I showed how digital technologies are not the only things that travel when they are used in other contexts and cultures, through the examples of digital gambling machines and the Internet. Cultural ideas of their creators, inscribed intentions (like profit increasing), and functions for specific needs are also migrating. Therefore, the socio-material elements involved in the innovation process of production are not erased, but are black-boxed in the object. In the second part I examined the processes of re-use and appropriation by approaching the cases of social media and 'open hardware' projects. My point was that digital technologies can also be re-built and re-mixed according to local contexts and needs. Thus, this evidence forces us to think about innovation from another perspective: one that is messier, improvised, locally functional, and even political. Finally, in the third part I have used ethnographic approaches to aboriginal paintings, virtual forums, and digital archives in order to understand how the characteristics of 'the digital' can help us understand migration and innovation in yet another sense. Migration is more than an object crossing a border, as the border can be built (or negotiated) inside the object. Similarly, digital technologies are more than a product, and innovation is more than the process that generates that product: innovation can emerge within that product, due to the structural openness of digital technologies.

Many anthropologists have dealt with the term of innovation in various ways. Some have tried to define it as the engine of every cultural expression (public or private), by relating it with terms such as imagination (c.f. Robins, 2010). Others have problematized the idea of innovation as a completely new and path-breaking discovery, by showing its complex relation to already existing traditions (c.f. Lohman, 2010). Complementing this critique of the 'out-of-nowhere' inventions, other authors have critiqued the popular idea that innovation can only be achieved through controlled and organized processes (c.f. Leach and Wilson, 2014). As I have shown in the second part of this paper, I agree with this latter perspective in the sense that innovation should be rethought as more improvised than it looks. However, I disagree in the sense that this cannot be the only way of seeing innovation either. A perspective of varied ethnographic cases shows us that innovation is actually plural: there are many innovations in the same process of migration – so why not leave the meaning of innovation open to many co-existing ways of defining it? In my opinion, this is the way an anthropological and ethnographic perspective can contribute to the interdisciplinary debate on digital technologies and innovation, as this helps us to challenge monolithic understandings of concepts, and open them to alternative and productive analyses.

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