

# How to make a “hackintosh”. A ride into the “consumerization” of hacking practices and culture

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## 1. Introduction

Until recently the world of the hacking technologies, computer and devices has remained largely confined to very specific sectors of society, and especially those constituted by informatics experts, software developers and tech activists. In this article it is argued that, during the last few years, hacking practices implicating the modification and subversion of digital devices are undergoing a process of popularization and are involving new segments of the population, different from software experts and informatics geeks, such as amateurs, laypersons and non-experts.

More specifically, I want to argue not only that hacking practices are becoming more common and usual in society, but that this shift also implies some sort of change in the contents and forms of the circulation of hacking knowledge and practices. This quantitative and qualitative change can be conceived in terms of a “consumerization” of hacking, that is the process through which hacking objects, competences and cultures are influenced by elements and features belonging to the consumer practices.

To develop this idea, the article focuses on the development of the practice of doing a “hackintosh”, that consists into the modification of a non-Apple computer in order to run an Apple operating system on it. This practice, which has started in 2005 within the actual context of hacking and by software developers, has soon evolved in different ways. Among these ways I will consider more closely some of the activities regarding the creation of a so-called “MacBook Nano”, a low-cost netbook transformed to an Apple run software. While the first stage of the development of the “hackintosh” fits well into a canonical description of hacking activities, on the other way, the subsequent circulation of tutorials, information and competences required to

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make a MacBook Nano shows us a trajectory of popularization of hacking practices, which both imply a simplification of technical contents and the change in cultural codes and communication channels involved in the circulation of the hacking methods and procedures.

After presenting a short description of the development of the project of doing the hackintosh, I will then concentrate on an analysis of some of the tutorials, guides and tools involved into the creation of a MacBook Nano. Then, by adopting a “Practice Theory” perspective (Shatzky *et al.*, 2001; Warde, 2005; Shove and Pantzar, 2005), I will discuss the reciprocal influences between hacking and the cultural elements related to consumer culture that are influencing the same hacking practices, with the aim to offer a theoretical framework useful to study the ongoing reciprocal influences between hacking and other ordinary social practices.

Now, before presenting the case of the hackintosh, I will develop some considerations about the relationship between hacking and consumer processes and cultures and their so far neglected relationships.

## **2. Hacking , society and consumption processes**

In these last fifteen years, the realm of hacking has received a growing attention by social sciences, journalists and the intellectual world. If in the media it is today common to find news about hacking’s activities, also amongst social scientists the phenomenon of hacking has obtained more and more consideration. Since the eighties, the hacker culture acquired a wider status in society, especially after the hacker’s ethics have been described by the tech expert Steven Levy (1984), who and praised them as a libertarian culture, connected with free access to information and the search for a better life quality. Years later, the hacking ethics have also been associated with the emerging of a new form of production and a new way to manage the relationship between work and life, situating the hacking culture as the progressive evolution of what Max Weber defined as the «ethic of capitalism» (Himanen 2001). Among the more common discourses about hacking culture, that which distinguished between the «black hat» and the «white hat» hackers became a dominant interpretation of a chaotic phenomenon, allowing to establish an ideal distinction between progressive and legal forms of hacking and dangerous and illegal cybercrimes (see Jordan, 2008).

Another relevant point of view that characterized the understanding of the hacking culture has been the one pointing out the conflict and tension existing between computers security industry and the computer underground, which clearly represents the more “institutionalized form” to intend what hacking is (Taylor, 1999). Moreover, more recently, the discourses surrounding hacking culture have also developed a more explicit political framework, thought the definition of “hacktivism”, today common to intend the subversive use of computers to promote political, mainly radical, ideas and practices (Jordan 2002; Jordan and Taylor, 2004).

This very short summary tells us that hacking in itself and the scientific discourses around it has evolved including different perspectives and enriching our understanding of the phenomenon. Nevertheless, all the relevant accounts presented have in common the fact they consider hacking as something connected with two main specific realms of social life: software professionals and political activists. None of them make some specific and consistent connection between hacking and the world of consumption. None of them make reference to the fact that hacking practices can also be analyzed as inextricably embedded in consumer societies and that their recent evolutions could lead to redefine social boundaries, tensions and influences between the side of production and that of consumption in the contemporary world.

Very recently, some scholar has started to develop more sensitive understandings of hacking with respect to the issues related with consumption. One of these few attempts is the work of Söderberg (2008), who has developed an analysis of hacking on the basis of a Marxist framework, highlighting in some of his parts not only that hacking is strictly rooted in the very same nature of the consumer capitalistic society, but also that the evolution of hacking is questioning the regular capitalistic circulation of goods as well, allowing to disjoin the convectional production-consumption loop (Sodenberg 2008, p. 109 *et seq.*). Anyway, while Sodemberg engages into a discussion of the tensions between hacking, production and consumption, he nevertheless does not develop empirical examples on the actual ways hacking embraces consumers attitudes and practices remaining on a sole theoretical ground. Another kind of perspective is the one developed in Magaudda (2010), where the author has stressed that some of the typical features characterizing the hacking realm – such as the involvement of users in modifying their technologies or the implicit or explicit political perspective on the products they modify – can be

understood as a point of connection between hacking and the processes of consumption.

The reasons for the lack of consideration of the relationship between hacking and consumption can be traced up to at least two separate dimensions. The first dimension implies the fact that hacking is an activity originally developed within expert circles and professional and productive environments. Thus, given these roots of the phenomenon, it is not strange that scholars are delayed in focusing on the features that link hacking with consumer practices, preferring instead to concentrate on the involvement of experts and professional users rather than on the implications for laypersons.

The second dimension that helps explaining the lack of consideration for the nexus consumption-hacking regards the ways in which social and human sciences have more in general always privileged the analysis of production respect to consumption. Since Karl Marx's analysis of the «relations of production» (Marx 1847), the inquiry of social life has always preferred to look at the problems concerning production. As we have already recalled, also Max Weber (1921) recognized the basis of capitalistic society in the protestant people's attitude toward the commitment to work and make money (an interpretation subverted more recently in Campbell, 1983). Also Emile Durkheim (1893) developed large part of his understanding of changes occurring at the end of the nineteenth century society as a problem of «division of social labour». To sum up, it is not until very recently, say the Seventies and the Eighties of the past century, that social sciences have started to reflect about themselves in terms of a “consumer society” (i.e. Debord, 1967; Baudrillard 1970). The lack of recognition of the role of the constitutive role of consumption in society is something that affected the analysis of society in general and, of course, is also influencing the study of hacking.

Nevertheless, we have many reasons to stop to consider how hacking is intersecting with the world of consumption. For instance, hacking can be seen as one of the prototypical features through which people are consuming in the contemporary society. Indeed, hacking also means an active way to interact with objects we use and it implies the tendency to some sort of modification and re-adaptation of standard products. At this regard, Colin Campbell (2005) has explicitly addressed the changing nature of consumer involvement in the modification of commodities by developing

the figure of the “craft consumer”. “Craft consumer” is the one that is involved in consumer practices that imply manipulations of commodities and objects, and he describes them in a way that sounds very analogous with many features of hacking culture. He writes that “the craft consumer is a person who typically takes any number of mass-produced products and employs these as the ‘raw materials’ for the creation of a new ‘product’, one that is typically intended for self-consumption” (Campbell, 2005, pp. 27-28).

Another relevant question recently addressed in consumer studies concerns the fact that consumers are having new and powerful tools to engage in products’ modifications. Indeed, the spread of internet web sites, forums and web 2.0 services is offering consumers opportunities to acquire competences and knowledge with which they can manipulate objects and commodities. The relevance of web tools for these kinds of consumption patterns has recently been addressed in a special issue of the “Journal of Consumer Culture” edited by Beer and Burrows (2010). In this issue, Ritzer and Jurgenson (2010) contributed to defining more scrupulously the influence of web 2.0 services on consumer practices, developing the concept of “prosumption”, by which the two scholars address all the phenomena related with the blurring of the boundaries of production and consumption happening with in the use of web 2.0 applications.

One crucial point when comparing hacking and consumption regards the complexity of the competences and skills involved in the former as opposed to the simplicity and accessibility of the latter. Also in this case, recent developments in consumer studies put this issue under a different light. Indeed, Shove, Pantzar and other colleagues (Shove and Pantzar 2005; Shove *et al.* 2007) have richly shown that ordinary consumption practices of consumption often require specific sets of competences that need to be circulated and learned. More specifically, Watson and Shove (2008) have highlighted that consumption practices connected with doing-it-yourself attitudes are not only even more present in society today, but are also a crucial area where to understand the changing relationships between consumption, the modification of objects and the social learning of specific competences.

What I want to highlight with these few considerations concerning parallelisms between consumption and hacking practices is that there are many reasons to carefully focus on the reciprocal influences between hacking practices and the emerging

consumption practices and behaviours. It is on the basis of these considerations that we can now start to focus on the development the hackintosh project and on how some of its evolutions can bring new light on the evolving connection between hacking and consumption.

### **3. Birth, development and circulation of the hackintosh project**

A hackintosh is a personal computer made up of non-Apple hardware that has been adapted or modified to run the Apple operating system, which is known by the acronym OS X (Operating System tenth). The same name hackintosh makes the hacking origins of this object evident, being its name a portmanteau between the words «hacking» and «Mackintosh». The development of the hackintosh has been made possible by the start of a collaborative hacking project called OSx86, which has been launched in 2005 with the aim of developing the conditions to run the OS X on machine based on the x86 architecture, the basic architecture of all the Intel microprocessors, which the same Apple has adopted since 2006 for all its Macs.

At the basis of the development of the hackintosh we find a specific technical choice in Apple's commercial strategy. Indeed, while since 1994 Apple has used for its computers a specific family of processors, the PowerPC based on a specific project developed together with by Ibm and Motorola, in 2005 the Cupertino company announced the decision to shift from the Power PC family to the Intel processors, due to better evolution chances offered by Intel in terms of calculation performances and power consumption. Thus, when in 2006 Apple started to sell the Intel-based Macs together with an updated version of his OS X – which was originally designed to work only on Power PC processors and not on other machines – it became relatively simple to make the OS X run natively also on non-Apple hardware. As counterpart, it also became possible to run Microsoft operating systems on Apple Computers, an option that Apple itself exploited in commercial terms to convince new costumers to abandon their Windows-based computer in favour to the new Macs able to run both OS X and Windows.

Apple announced the processor's shifting in June 2005 and released the first generation of Intel-based Mac in January 2006. Meanwhile, just few weeks after the 2005 shifting announcement, the hacking community started to work on making OS X run on a non-Apple computer. The initial concrete results arrived one month later the

commercialization of first Intel Mac models and the first accredited hackintosh was made by February 2006. This hack was quickly followed by a software update by Apple, aimed at stopping the code hole exploited by this hacking method. Since this moment, several different attempts to circumvent Apple software to run on a non-Apple hardware have been realized, soon followed by Apple's reactions to limit or block these hacks, in the usual cat-and-mouse game common to hacking stuff.

Until 2007 hacking procedures to create a hackintosh remained pretty complex and difficult, involving huge informatics competences and, therefore, making the hackintosh feasible just for expert programmers and software professionals. In 2007 a hacker named *BrazilMac* (because actually born in Brazil; see [Claburn 2007](#)) generated a new simplified patching process, called with his same name BrazilMac, which made it simpler to install Mac OS X onto a non-Apple hardware by using a legal retail version of Apple Mac OS X. After this method, other different hack techniques appeared, developed and circulated, the most popular being called JaS, Kalyway, iATKOS, iPC and iDeneb.

One further step in the hackintosh development took place when, in mid 2009, Apple released a new version of its own OS, the number 10.6, named after a feline's name – as usual for Apple – Snow Leopard. Very rapidly, after this release the Russian hacker *netkas* created a hack method that allowed booting a Mac directly with a copy of the Snow Leopard OS. In occasion of the subsequent OS Apple release round, when in February 2011 Apple released only the preview of the new Lion 10.7 OS, another Russian developer, named *usr-sse2*, was the first to create a method to install them on a non-Apple hardware after just 3 days from its release, making public this other simplified process consisting in copying the OS X Lion into a flash drive, and booting them in the computer using another small software (a so called “bootloader”).

As we can understand from this short story regarding the hackintosh development, the work carried out by hackers for installing OS X into a non-Apple hardware has grown during the years in different ways, involving many developers and also the collective efforts of several web sites and communities. We can rightly argue that the initial story does not sound very different from other previous stories in the world of hardware hacking and of computer “geeks”. Indeed, we have seen that the project had be started by expert programmers and developers through a

collaborative online project; the continuous advancements and evolutions in the hacking story has been “signed” by “regular” hackers with their typical bizarre pseudonyms and often with real – or supposed – Russian origins; the competences required just to understand the processes of hacking were out of reach of even evolved amateurs not working deeply in the software creation. On the other hand, what we can note is that the evolution of the hackintosh scene clearly evolved in the direction of a simplification of methods and procedures. These methods started as very complex and evolved in simpler ways, for example allowing to install a regular copy of the OS X or downloading an already patched version to be installed, such as in the case of iDened, one of the most popular methods to install the OSX and create a hackintosh.

This perspective is corroborated when we consider the principal web sites through which hackintosh culture and practice have been created and circulated. Indeed, the most important hackintosh webs are sites fed by very expert people, such as software developers, and are hardly understandable by regular personal computer users. The most important of these sites is a wiki page devoted to the development of the whole osx86 project (<http://wiki.osx86project.org>). It contains a lot of information needed to create a hackintosh and it also aggregates many other sources available and placed outside of the wiki. The typology of this web site – a wiki where users can collaborate quite chaotically to develop information and knowledge – remains largely far from the technical competences and possibilities of laypersons. Its friendly welcome to the reader on the home page is probably the only section of the web site an average user can approach:

Welcome to the OSx86 Project - the undisputed leader in information regarding OS X on x86 hardware and Apple's Intel transition. Open since 2005, the OSx86 Project offers users a place to trade and share information about OSx86 and the various hardware needed to run it; a virtual Wikipedia of OSx86 resources ([http://wiki.osx86project.org/wiki/index.php/Main\\_Page](http://wiki.osx86project.org/wiki/index.php/Main_Page)).

Another relevant web site in the evolution of the hackintosh practice is [www.hackintosh.com](http://www.hackintosh.com). This site is less an aggregator of technical information and more a container of more focused instructions and tutorials to transform PCs into hackintoshes. The more practical attitude of this web site is also emphasized by the short initial description of the web, useful to the reader to orientate himself or herself into the site:

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Hackintosh.com provides links to everything you need to build your own Hackintosh and get Mac OS X 10.7 Lion or Mac OS X 10.6 Snow Leopard running on an unsupported computer – Instructions, step-by-step “how to” guides, and tutorials – as well as installation videos, lists of compatible computers and parts, and communities for support ([www.hackintosh.com](http://www.hackintosh.com))

Moreover, Hackintosh.com not only focuses on technical tutorials, but is also linking and networking together many other different forum communities related with the hack of Apple hardware. Indeed, the hacking of Apple-related technologies has generated in these last few years the births of several forums and scenes. The Osx86 wiki also runs its own forum (named “Insanelymac”) as well as other Apple communities do, developing their own discussion spaces on how to hack a Mac. These other forums can be more specific in their aims, for example in the case of AcquaMac (<http://aquamac.proboards.com>), a forum focusing prevalently on “modding” activities (aesthetic and performance modifications). Or these other communities can be sub-sections of other already existing Mac communities, such as in the case of Applecentral.com, which is the forum sponsored by the “MacTech Magazine” and whose space deals with wider topics (containing also other more general topics of discussion), dedicating just one small section to hacking stuff.

Of course, as it is typical of the hacking culture, we can also find technical manuals published by standard publishers on the topics regarding the hackintosh. The most important is a manual titled *OSx86: Creating an Hackintosh* (Baldwin, 2010), which consists in a purely technical guide for users to create their own hackintosh running a 10.5 (Leopard) version of the Apple OS. This further way of dissemination of the hackintosh project is both a confirmation of the interest raised by these practices amongst software experts and the corroboration of the idea that doing a hackintosh remained restricted to that kind of users that usually read technical software guides.

By the way, it is to be noted that creating a hackintosh by installing the Apple software in a non-Apple hardware remains officially illegal and Apple worked to affirm this position both technically and legally. The illegal nature of doing a hackintosh relies on the fact that all Apple’s software is distributed under a specific EULA (an *End Users Licence Agreement*), which is formally a contract between Apple Inc. and the purchaser. In the Eula it is stated that the user gets the software

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under the specific condition to use it only on Apple hardware, thus making all different uses a breach in the contract. This interpretation has been confirmed also by a US federal court, which in 2009 ruled in favour of Apple in the “Psystar case” raised against a company who had started to sell directly to the consumer hackintoshes ready to be switched on (Keizer, 2009).

#### **4. Netbooks, Apple and the creation of the MacBook Nano**

Until now I have described the development of the hackintosh as a relatively “ordinary” hacking project, started by anonymous hackers and software experts though collaborative web tools. I will now focus on a sub-phenomenon of the hackintosh, which will allow focusing more specifically on some of the aspects that go in the direction of popularization and, at some degree, of “consumerization” of hacking practices. This further case regards the diffusion of modifications involving small low-budget Windows-based netbooks, particularly diffused on the consumer market after 2008. We will consider the evolution and especially some of the channels through which this practice has circulated outside the tight circles of computer experts. This hack consists in transforming netbooks into Macs and we will call them the construction of a “MacBook Nano” (see Fig. 1), an appellation that does not fit with any real Apple products and that is named after a popular definition coined by many tech experts and journalists (see for example Estrada, 2008; Lai, 2009)



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Fig. 1. One netbook transformed into a MacBook Nano, which has also been aesthetically modified to assume aesthetic resemblance with an original Apple's product.

The story of the MacBook Nano developed not before 2008, after the large-scale commercialization of a new kind of computer named netbook. While at the basis of the initial hackintosh development we have a technical change – Apple's shift to Intel processors – at the origin of the MacBook Nano's phenomenon there are at least two different decisions, mainly concerning laptops market. On the one side, we have the commercial successfulness obtained by these new small low-price netbooks; on the other we have Apple's specific decision to not directly enter this commercial sector.

One of the many passages in the history of the personal computer regards when in 2007 Asus introduced a different kind of small and low-cost portable computer named EeePc. This small laptop had two main features: it was very small, having a screen between 7 and 10 inches and a weight of about 1 ad 1.32 kilos; and it was manifestly cheap if compared with a regular laptop, displaying a price target between 300 and 400 dollars. The netbooks' arrival on the market produced relevant movements in the whole portable computer's sector. Indeed, between 2008 and 2010 low-cost netbooks gained about one fifth of the overall netbook market (Teglet, 2009), starting to slow down in sales only in 2011, just after the new device category of the tablets (mainly the iPad) started to get its momentum (Perry, 2011). The second relevant decision that put gasoline in the MacBook Nano's phenomenon came from Apple. When the netbook fashion detonated in 2008, Apple decided not to enter this sector characterized by low-cost machines. On this topic the position of Steve Jobs was clear and was officially presented by himself during one of Apple's semester marketing events:

I think that when people want a product of the class that we make, over and over again people have done the price comparisons and we're actually quite competitive. So we choose to be in some segments of the market and we choose not to be in certain segments of the market. [...] There are some customers which we chose not to serve. We don't know how to make a \$500 computer that's not a piece of junk, and our DNA will not let us ship that. (Steve Jobs, October 21, 2008 (quoted in McLean, 2008))

By the way, after more than two years from these declarations Apple launched

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its 11-inches MacBook Air, a computer resembling the physical dimension of a netbook and also relatively cheaper compared to the average Mac laptop (but still about three times more expensive than a standard Windows-based netbook). Apple's decision not to offer a netbook-like product generated a situation where Mac's users had not the chance to have a small laptop running OS X, which is usually considered one of major benefits in owning a Mac, together with its aesthetic qualities.

This situation, characterized by the demand for a product and the lack of an official offer by Apple, generated a very good situation for the development and the diffusion of the MacBook Nano. Indeed, between 2008 and 2009, soon as netbooks became common devices on the market, hackintosh versions of the Leopard OS became available to users through simplified installation methods, thanks to the work developed during the previous years by the hackintosh communities.

If until now we have seen that web sites involved in the hackintosh dissemination had prevalently traced out usual forms of exchange amongst experts, professionals and pro-amateurs, we will now put our attention on the different profile characterizing the circulation of the methods to do a MacBook Nano. Thus, in the next section I will analyse some of the most relevant web pages that helped the MacBook Nano circulate, with the aims of pointing out that the diffusion of netbooks hacking has produced a "translation" of the codes and contents belonging to the realm of hacking into forms suitable from a wider audience. I will specifically address this process of translation in terms of a "consumerization" of hacking practices and culture.

## **5. Mediating technical complexities in the "consumerization" of MacBook Nano**

As it has been said, the case of the MacBook Nano added some different features to the circulation of the hacking project OSx86, which differently from the netbooks' modification has followed a common pattern for hacking activities (collaborative projects without profits; competition to hack before others; uses of wikis and forums, etc.). What was partially new in the MacBook Nano, and specifically interesting for this analysis of the relationship between hacking and consumption, regards the happening emerging element of simplification and popularization in the circulation of hacking practices and knowledge.

One of the main forms of popularization of the hackintosh consists in the

manners popular magazines and blogs gave visibility to the MacBook Nano hack. While hackintosh has mostly evolved through wikis and forums and has implied expert forms of competences and knowledge, blogs and popular magazines have contributed in amplifying the circulation of the MacBook Nano, translating technical procedures in simpler and clearer forms. Thus, these blogs and magazines have played a role of intermediation between expert knowledge and laypersons' competences, developing a translation process of the complexities involved in doing a hackintosh.

One example of translation performed by blogs is that of the blog MacEee ([www.maceee.blogspot.com](http://www.maceee.blogspot.com)), a space devoted exclusively to sharing one specific method to install Apple's Snow Leopard on a certain Asus's netbook model, the EeePC 1005HA. This tutorial published in February 2010 is very simple and its form presents at least three specific features that go in the direction of a simplification of the hackintosh's complexities. The first one consists in the fact that this blog only deals with one of the most popular and widespread models of netbook available in 2009-2010. This means that it simplifies the doing of a hackintosh on the bases of the needs of the users of one of the most popular netbooks on the market. The second feature is that the tutorial, differently from other ones, does not require a high level of knowledge in informatics – for example the need to understand and write codes or other exoteric stuff for normal pc users. The only activities required to users are pretty simple: installing the software, copying files, launching and stopping programs, checking and unchecking functions through graphical interfaces.

Finally, the last blog's interesting feature consists in how the hack procedure is textually arranged. Also in this case, the tutorial page is organized by targeting not experts, but wider categories of users. The most challenging steps are illustrated with screen prints and what is more relevant is that the tutorial starts – as many kits for laypersons do (like the Ikea furniture tutorials) – with lists such as “What you need” and “what is working”. These blog features let us see how a complex set of skills and information can be popularized both in its contents and in form, operating by this a process of translation between codes, knowledge and activities belonging to different realms of practices.

Together with blogs, another crucial channel of circulation of doing the MacBook Nano's modifications has been constituted by popular magazines' web sites focused on technology, such as Wired, Gizmodo and Arstechnica. During these last

few years, these magazines not only provided coverage and information for common readers about the advancement of hackintosh, by they also displayed their own tutorials on how to do a MacBook Nano, contributing substantially to mediate specific competences and knowledge compared to their larger and more undifferentiated audiences.

One of the most popular tutorials on transforming a netbook is the one published by Gizmodo in February 2009 and viewed by more than 1.2 millions (at October 2011). The article, titled *How To: Hackintosh a Dell Mini 9 Into the Ultimate OS X Netbook*, appeared before the previous MacEEE blog guide and focuses on an hack method for a specific model of netbook in those days also very popular, the Dell Mini 9. The tutorial is more complex than the previous one, because it also required the use of the “terminal” (an emulator of an old terminal, allowing the user to interact with the computer through a command line interface). Anyway, also this article shows a very friendly approach with respect to the organization of knowledge offered by wikis and forums; it starts with the “What You'll Need” list and provides the reader with all the main contextual information, for example those regarding the issue of the Eula’s violation and also giving additional basic information for the general user.



Fig. 2 – The article on how to do a Hackintosh on a netbook published by Gizmodo, in February 2009 and viewed by more than 1.2 millions at October 2011 (<http://gizmodo.com/5156903/how-to-hackintosh-a-dell-mini-9-into-the-ultimate-os-x-netbook>).

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Another relevant example of the role played by popular magazines in the popularization of the MacBook Nano has been an article spotted by Wired.com, that is probably the most important and authoritative magazine about science, technology and computers (co-founded by relevant figures in the tech scene such as Steward Brand and Kevin Kelly; see Turner 2008). In December 2008 Wired posted on the web its own video tutorial on how to install Apple Leopard OS on a MSI Wind, another popular netbook (Chen, 2008). After that move, Apple contacted Wired asking them for the immediate cancellation of the video and possibly menacing also a suit against the magazine (Buchanan, 2009). The video was promptly pulled out by the magazine, even though Wired left online a written guide with a disclaimer saying that the “process potentially violates Apple’s End User License Agreement for Mac OS X” (<http://www.wired.com/gadgetlab/2008/12/gadget-lab-vid/>).

The request made by Apple to Wired is curious not only because, while the video has been removed, the written instruction remained on the Wired site as well as in other hundreds of official and unofficial forums. The request about the video’s elimination intrigues also because many videos regarding hackintosh can be easily accessed on web: as at October 2011 a request to YouTube containing the word “hackintosh” generates about 70.000 different videos showing many different ways to install OS X into a Pc. One of the most popular of these videos, viewed by more than one million of users and titled *How to install Mac OS X Leopard on a PC*, is narrated by Tom Merrit, the executive editor of CNET, another key player in the web magazines scene for technologies and gadgets reviews (<http://www.youtube.com/watch?v=V8oVU5AjqhU>). It is not clear why Apple asked Wired only to remove the video for the public infringement of its Eula. In any case, it was absolutely impossible for Apple to stop all the thousands of tutorials, guides and comments on the practice concerning the hackintosh around the web. More in general, we can argue that the diffusion of successful hacking tutorials to create a MacBook Nano on magazines and on YouTube represents a visible fact of how hacking practices acquired a more significant space in the wider contemporary circulation of culture.

Let’s take one further example to better understand the process of “consumerization” of hacking practices. This example is represented by one of the

main instruments required for the creation a MacBook Nano: a netbook compatibility chart that explains which netbooks are compatible with the OS X installation procedure. Indeed, when starting to do a MacBook Nano, the first step everyone has to undertake consists into checking if one’s own netbook is fully compatible with the hack procedure or not. Many web sites offer this kind of information in different forms, and some of them give this information in the formula of a chart. One of the most effective charts is that published and updated by the web site Mymacnetbook.com, another point of reference in the mediation of the complex mass of information regarding the hackintosh.

This chart presents the several models of netbook available on the market on the left, listed in alphabetical order, and, on the bottom, the main components working into a netbook. At the cross between the models and the components list, we find green, red or grey circles, which indicate if, after installing Apple software, the components will still work regularly or if they will be dead. Finally, on the right side of the chart, we can also find a direct link that goes straight to the site of US Amazon, where it is possible to buy the specific model of netbook one wants to transform.



Fig. 3 – The Chart of netbooks compatibility with the hackintosh procedure constantly updated by Mymacnetbook.com

A careful consideration of this chart can tell us at least three interesting things about how, in the case of the MacBook Nano, hacking is being readapted in the direction of a simplification and a “consumerization” of hacking practices and knowledge. The first element regards the high degree of simplification the chart is



able to produce if compared with the information offered by web sites targeting mostly experts and developers, like forums and wikis. Here everything is absolutely clear for layperson users, who can easily understand if their own netbook could be good enough to be transformed into a MacBook Nano.

The second point is that this simplification is obtained by appropriating a specific visualization tool, which consists into a chart displaying different products and all their features. Far from being typical of the hacking cultural context, this extremely user friendly visual chart can be reasonably compared to the charts that compare products, commonly used in consumers magazines' comparisons, such as those of "Consumer Reports" in the US, "Which?" in the UK or "Altroconsumo" in Italy. We interpret the adaptation of hack information into a chart as a form of semiotic translation of the hacking knowledge by appropriating a typical visual tool already established and common in consumer culture.

Finally, the third element we can point out in this chart consist in the direct links to the Amazon Store, allowing to purchase the specific model of netbook compared directly . Probably, the web site that update the chart is part of the Amazon advertising program (<https://affiliate-program.amazon.com/>), which permits to make money from the links that go to the Amazon online store. Even if not, it is clear that this kind of advertising system, connected with the sale system of one of the biggest world technology sellers, can hardly fit into the traditional visions we have of hacking ethos and practices. Also for this reason, the netbook compatibility chart appears to be one step toward the construction of a different kind of circulation of hacking, a circulation marked by a cross-fertilization with element coming from other social spheres, such as in the case of that connected with consumption and consumer habits.

## **6. Conclusion: the "consumerization" of hacking practices from a Theory of practice perspective**

After having considered the development of the hackintosh, we have seen that some aspects of its evolution, those connected with the MacBook Nano, have been characterized by a process of simplification, which has been more analytically described as a "consumerization", i.e. the translation of some of the hacking practices and competences into the codes and languages typical of consumer cultures and practices. The question here is not to discuss if the netbook hacking has become a

popular and common activity, embraced by the majority of the population. Of course this is not the case. Rather, this analysis has focused on a specific case of hacking in order to highlight some of the transformations in the circulation of hacking knowledge and cultures in society, pointing out, more specifically, how these processes can be fruitfully understood if analysed in terms of how hacking practices are translated and readapted under the influence of other social practices, for instance the practices connected with consumer culture.

One of the ways to make sense theoretically of the process of popularization of hacking practices is to embrace a perspective rooted into the Practice Theory (Schatzky *et. al.*, 2001; Reckwitz, 2002). To put it very shortly, Practice Theory is a theoretical framework based on the idea that social phenomena should be better understood considering «practice» as the main unit of analysis and, consequently, that the sources of change in behaviours and activities should be identified in the evolution of the practices themselves and in the emerging interactions between different and previously separated practices (Warde, 2005; Sassatelli, 2007). In consumer studies, Practice Theory assumes that consumption activities are the result of individual performances imbricated and intertwined in a complex socio-material context where meanings, objects and embodied activities are arranged in specific configurations of “practices”. In this framework, the concept of “practice” is regarded as a whole, shared and stabilized “configuration” consisting “of several elements, interconnected to one another: forms of bodily activities, forms of mental activities, ‘things’ and their use, a background knowledge in the forms of understanding, know how, states of emotion and motivational knowledge” (Reckwitz, 2002, 249). These elements can pass from a practice to another, giving raise to changes and evolutions of practices themselves.

This approach has been empirically developed by Shove, Pantzar and other scholars (Shove and Pantzar, 2005; Shove *et al.* 2007) to understand the evolution of several kinds of consumer practices. One of their main contributions was to assume that the heterogeneity of elements constituting a “social practice” can be more easily simplified according to three main analytical dimensions intertwined with one another. These three dimensions are: a) the dimension of meanings and representations; b) one consisting in objects, technologies and material culture in general; and c) and one including embodied competences, activities and “doing” (see

especially Shove and Pantzar, 2005; Magaudda, 2011). This articulation of the theory of practice allow to put specific emphasis on the understanding of dynamics of change and transformation of social practices and it gives us an interesting tool to make sense of how hacking practices and consumer practices can influence each another, producing changes both in hacking activities and consumer behaviours.

The present analysis of the evolution of the practices connected with doing a hackintosh has heavily drawn this Practice theory conceptual framework, which has allowed to recognize at least two different forms of influence going on between hacking and consumer practice. The first one is the one we have mostly highlighted and consists into the process of “consumerization” of hacking practices, i.e. the “importation” of some of the elements common in consumer culture into the forms of circulation and sharing of hacking activities and knowledge. At this regard, the example of the compatibility chart is the one that exemplifies in a clear and visible way how elements belonging to consumption processes can be readapted to the spreading of hacking activities.

But we can also point out a second form of influence, which has emerged only implicitly from our hackintosh story and that regards the opposite direction of interaction: from hacking practice to the realm of consumption. In this sense, we can see that today it is more and more common to recognize in consumer culture elements coming from the context of hacking. We have already noted that, in consumer culture, forms of modification of hardware are increasingly integrated into the circulation of goods (Campbell, 2005; Watson and Shove 2008). One great example is the practice of modification of Ikea furniture, exemplified by a website which also symbolically makes reference to the culture of hacking ([www.ikeahackers.net](http://www.ikeahackers.net); see Rosen and Bean 2009) and that make visible one of the possible interactions from hacking to consumer practices and that lets us also discern a process of “hackerization” of consumer practices.

In a contemporary context where we assist to an increasing centrality of personal technologies, devices and media in the consumer experience, the cross-fertilization between hacking and consumption constitutes a relevant area of innovation. In the next few years, we will probably assist to a further and even more clear convergence, where the original attitude of modifying and subvert hardware, typical of hacker *milieu* will interact with the increasing tendency amongst consumers

to modify their consumer technologies. The case presented of the MacBook Nano can be assumed as a ride into the emerging interaction between hacking and consumption, that, we can reasonably assume, will probably become ever more common and widespread in the next years, turning to be a recurring feature in the ways the consumption of digital technologies and services evolves, are appropriated and transformed.

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