TITLE A recipe is an open-source design

ABSTRACT This essay takes the definition of open-source design as commonly understood in computer programming and applies it to recipes. Specific speculation about what recipes are, what they are like and how they work allows for a general reflection about culinary creation and leads to the specification of the components that make up a cooked dish and the act of cooking.

KEYWORDS creativity, cooking, design, gastronomy, open source, recipe

A recipe is an open-source design

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In keeping with its commitment to innovation, the European Commission launched the European Design Innovation Initiative (EDII) in 2011. The goal of the initiative was to raise awareness of design as a driver of innovation in Europe, to reinforce its role as a key discipline for bringing ideas to market and transforming those ideas into easy-to-use products that would be attractive to EU companies and public services. The first strategic action proposed was to differentiate European design on the global stage, and the second was to 'Create guidelines, codes of practice, legal frameworks and experimental spaces to promote the use of open design' (EDII 2012). This second strategic action was explained by means of the contention that innovation processes are no longer only connected to traditional business models, but rather they are now influenced by and modelled after broader social developments based both on technology (like wikis and other peer-to-peer Web 2.0 phenomena) and on the growth of new approaches towards production (including Fablabs, Future Factories, Micro-Factories and Living Labs). As a result, the nature of the relationship between the designer, the manufacturer and the consumer is changing, which allows for new forms of innovation such as co-design.

Open design seeks to restructure the relationships among the stakeholders involved in the design process using the advantages offered by new approaches to the protection of intellectual property and new ways of working facilitated by technology. It endeavours to allow a freer type of collaboration take place within networks made up of designers and stakeholders. These flexible networks are of a short-term nature, change to accommodate needs at any given time, and do not have a fixed structure. The basic principles of open design

are successful in cultures that embrace diversity, advocate closer relationships and cultivate democracy. And given that these are European values, open design provides an opportunity for European design to truly stand out (EDII 2012).

1. What is an open-source design?

And what is open design? It is everything designed:

> *Based on the methods of open-source design, new approaches to intellectual property and facilitated by the internet, enabeling the collaborative development of physical products, machines and systems through the use of shared design information* (EDII 2012)

And if it is based on open-source design methods, what exactly are those methods? The Open Source Initiative (OSI) is a global non-profit organisation that promotes and provides support for the open-source software movement. Among other things, it holds a definition of what is considered open source as well as a list of licenses that fit that definition. According to its definition, simply facilitating access to source code is not enough to consider something open source. Open-source distribution terms must meet the following criteria: 1. Free distribution (the license cannot restrict any party from selling or giving away the software as a component of an aggregate software distribution containing programs from several different sources); 2 Source code (the program must include source code, and must allow distribution in source code as well as compiled form); 3. Derived work (the license must allow modifications and derived works, and must allow them to be distributed under the same terms as the license of the original software); 4. Integrity of the author's source code (the license must explicitly permit distribution of software built from modified source code. The license may require derived works to carry a different name or version number from the original software); 5. No discrimination against persons or groups; 6. No discrimination against fields of endeavour (the license must not restrict anyone from making use of the program in a specific field of endeavour); 7. Distribution of license (the rights attached to the program must apply to all to whom the program is redistributed); 8. License must not be specific to a product; 9. License must not restrict other software (for example, the license must not insist that all other programs distributed on the same medium must be open-source software); 10. License must be technologically neutral (no provision of the license may be predicated on any individual technology or style of interface).

The Open Design Foundation seeks to transfer these 10 requirements of open-source software to the area of design. The mission of the Open Design Foundation is to promote an alternative method for designing and developing technology based on the free exchange of comprehensive design information. Among other projects, it offers an online forum that aims to define the parameters a design must meet in order to be considered 'open'. The current status of what defines a design as 'open' is a list of nine requirements, eight of which are identical to those published by the Open Source Initiative. The requirement that diverges from the other list is one that refers to programming code and how it must be distributed.

Clearly, a design is not based on these parameters and the concept must be translated to a context consisting of different conditions. Thus, the Open Design Foundation considers:

> *2. Design Documentation. The embodiment must include design documentation, and it must allow distribution of design documentation as well as manufactured form. Where some embodiment is not distributed with design documentation, there must be a well-publicized means for downloading the design documentation, without charge, via the Internet. The design documentation must be the preferred form in which a designer would modify the embodiment (e.g. native file format used to create the design document). Deliberately obfuscating design documentation is not allowed. Intermediate forms (e.g. read only documents, G&M codes for a machined parts, or STEP translations of model files) are not allowed.*

In short, the plans must be provided (the native file format used to create the design) in a modifiable format in order for the design to be considered open. Would any designer do such a thing? Would product designers or interior designers provide the raw DXF of their work so that anyone could take it and work from it and even produce or have produced an exact replica of what they designed? Well, yes, as a matter of fact they would.

In the summer of 2012, Ronen Kadushin, an Israeli designer and design teacher who has lived in Berlin since 2005 was in Barcelona. He gave a presentation at a convention organised by the design historian Viviana Narotzky called *Open Design. Shared Creativity* during which he explored and discussed the emerging panorama of openness and exchange in design which has arisen from practices such as open-source software, public utility, delocalisation and collaboration. The conference is available online and there is open access to recordings of all of the speeches given. In 2004, Kadushin developed the concept of 'open design' with which one can download, copy, modify and produce his designs in a manner very similar to open-source software. Based on this concept, he founded 'Open Design', a furniture, lighting and accessory design and production company for products manufactured in Berlin and sold in Europe and the United States. Some characteristics of open design as understood by Kadushin are:

> *Designers, consumers, producers, retailers are communicating in an equal environment. Design and production are inclusive and decentralized. New products and services market. User innovation and customizing. Design is global but production is local. An Open Design product is always available, even if physically it doesn't exist. Native to the Internet* (Kadushin 2012).

At one point during his speech, Kadushin asked who in the audience would download the design of the 'hack chair', 'a 6 mm laser cut aluminium, bent by hand.' A forest of hands went up while other attendees were already connected to Ronen Kadushin's website on their iPads and immediately downloading the designs for the hack chair for free. As easy as two clicks and you get the DXF file and an

instruction sheet that says:

> *In order to produce this chair you need to be somewhat proficient with handling DXF files, have some knowledge of laser cut part production, have two good hands and a creative and experiment loving personality. If you have all these, there's a good chance you are an industrial designer or design student, if not, welcome aboard* (Kadushin 2009).

Exactly, 'welcome aboard' because if you don't know how to work with DXF files or how to produce laser-cut parts, the open-source file that Kadushin provides will help you begin. And, as the Open Knowledge Foundation clarifies: 'Open data are the building blocks of open knowledge. Open knowledge is what open data becomes when it's useful, usable and used.' According to the Open Knowledge Foundation, the key features of openness are: 1. Availability and access in that the data must be available as a whole and at no more than a reasonable reproduction cost; 2. Reuse and redistribution in that the data must be provided under terms that permit reuse and redistribution including the intermixing with other datasets; and 3. Universal participation in that everyone must be able to use, reuse and redistribute.

2. Openness in culinary design

It doesn't matter which of the definitions of open design shared here you apply or what conditions you impose on the qualities of openness of information: recipes meet all of them. A recipe is the design of a dish that has always been freely distributed, which is modified and from which other dishes are derived without restriction or discrimination and which is accompanied by information that documents the ingredients and the processes involved in the design as well as explanations on how to replicate it. Whether this is because of a legal loophole that protects them or because of a conceptual error with regard to culinary creativity or even a moral tradition of hospitality intrinsic to cooks (Buccafusto 2007: 1123), it doesn't matter. A recipe has been, is, and will hopefully continue to be an open-source design that also helps the novice to acquire knowledge that he or she did not previously possess. A recipe is an ideal that has always existed.

According to the chmist Hervé This, one of the founders of molecular gastronomy along with the late Nicholas Kurti, all recipes consist of two parts: the 'definition' and the 'precisions'. The 'definition' is made up of open data and the 'precisions', the knowledge that allows you to use them. To explain these two elements, Hervé This analyses a recipe from a cookery book published in France at the beginning of the 20th century (Anonymous, 1905):

> Take *a dozen* **pears of** *middle size,* remove the *skin and put them immediately in cold water.* Then melt *125g* of **sugar** *with some* **water** *in a pan at low heat: as soon as the sugar is melted, add the pears, add some lemon juice if you want to keep the pears white; if you prefer them red, do not add lemon juice and* **cook** *them pan lined with tin* (This 2005: S139).

In this recipe, the words marked in bold by This define the dish, and it is clear that the definition accounts for less than 10% of the recipe. The

words in italics add 'precisions', a category that includes advice, old wives tales, proverbs and sayings. Depending on the recipe and the author, the 'precision' content of the recipes can vary considerably. For example, This says that in some of the recipes by the French chef Jules Gouffé (1867), the percentage of 'precisions' is zero. With the example of the pear recipe, This wanted to demonstrate the scientific strategy of the science that he is contributing to building, molecular gastronomy, in which one has to model 'definitions' and explore 'precisions' (This 2005: S139). With regard to the 'precisions', science has to reveal their truth or falsehood. For example, is it true that if you put a little lemon juice in the pan while cooking peas they will retain their colour? This is when, according to This, scientific grounds must be applied to this advice passed down generation to generation. And, if it cannot be proven scientifically, then its falsehood or superstitious nature will be exposed.

In addition to establishing universal culinary truths, This sought to construct a universal scientific culinary language through the codification of the 'definition' part of a recipe. This involves translating recipes from everyday culinary language into expert scientific language. This suggests that dishes are neither solid nor liquid, but rather 'complex disperse systems' (CDS) and he has developed his own scientific language called 'CDS formalism' which aims to provide a global description of the physical microstructure of a dish by translating its recipe into a scientific formula. This involves analysing a dish in terms of its ingredients to examine their properties and determine how culinary transformations take place. For example, the recipe for whipped cream in CDS language translates into the global formula: '$O / W + G \rightarrow (G + O) / W$'. In other words, the oil (O) (the milk fat) is dispersed in water (W) and gas (G) (beating), which leads to whipped cream, often called Chantilly cream, from the French. This translation of recipes into formulas is called 'modelling dishes'. These recipes-formulas in CDS language can foster the invention of new dishes. One has only to replace some elements with others that have similar physiochemical systems. This method of culinary invention is called 'generalisation'. For example, in the formula for whipped cream, instead of milk fat one could use another type of fat, such as cheese or foie gras, resulting in cheese Chantilly and foie gras Chantilly (Solier, 2010: 158).

Can all recipes be reduced to their 'definition'? Will there eventually be a kind of periodic table of gastronomy? This should be the dream of the acolytes of molecular gastronomy. In any case, that milestone would not make recipes more open source than they are now. In fact it could have the opposite effect; it could allow them to be closed off from users as, in this hypothetical science of 'modelled' dishes, innovation and creation are easily detected and, depending on how one differs and moves away from these formulations, authorship could be defended and claims of intellectual property made.

Recipes are open-source designs, they were *born* that way and they continue to be that way because the law allows it. And the law allows it, according to experts, because of the conceptual error of considering that there is no creativity involved in the creation of a recipe, that a recipe is comparable to a list of ingredients like one might find on the label of a jar of sauce. According to Article 10 of the Spanish intellectual property law currently in force:

> «The subject matter of intellectual property shall be all original literary, artistic or scientific creations expressed in any manner or medium, whether tangible or intangible, that is known at present or may be invented in the future » (BOE 1996).

Intellectual property protects creations like books, texts, musical compositions, plays, choreographies, audio-visual works, sculptures, pictorial works, plans, mockups, maps, photos, computer programs, databases, artistic performances, phonograms, audio-visual recordings, broadcasts, etc. It is important to point out that ideas are not a matter of intellectual property if they are not expressed in a medium. Once they are expressed in a medium, what can be protected is the expression, not the idea. So, you might not be able to scan or photocopy a cookery book, but nobody can stop you from publishing those recipes in your blog.

You cannot be stopped from reusing or redistributing an idea, process, procedure, system, method of operation, concept, principle or discovery; you merely have to avoid using the form in which it is described. Recipes fall into this category. A simple list of ingredients is not protected under copyright law. However, when a recipe or formula is accompanied by a substantial literary expression as a means of explanation or instruction, or when there is a compilation of recipes, like in a cookery book, there may be grounds for protecting it from redistribution. Chefs can include suggestions for presentation in their recipes, give advice on wines to pair with the dish, or recommend table decorations or suitable music. In other cases, recipes can come with explanations of their origin or historical or cultural information. All of this is considered the expression of the author and the law does not provide for its open use. However, the recipe itself continues to be an open-source design. Even if the chef were talented enough to write the recipe in verse, the right to copy that verse would be denied, but nobody could be prevented from divulging the recipe (Lawrence 2012: 195-197).

The logical foundation for why recipes are not protected by law and cannot be converted into exclusive and reserved information stems from what many experts consider to be a conceptual error with regard to culinary creation. The identification of the ingredients needed to prepare a dish is considered a declaration of facts. A list does not contain any expressive components. Authorship is limited to expressiveness, which is what contains the author's seal of originality. Facts, whether alone or compiled, are not original. Only the arrangement of those facts can be considered original (Lawrence 2012: 198).

The first person who found a 'fact' did not create that fact, he or she only discovered it, and nobody can appropriate the discovery of an existing fact. The first person who discovered that when cream (milk fat) is whisked with air it expands to approximately double the volume of the original liquid merely discovered the existence of a fact. That's right. And the diners who pay hundreds of dollars to eat at the elite restaurants of the world would not pay even a penny to taste that fact. And a dish is not derived from that fact. Saying that a recipe is a list of ingredients is like saying a piece of choreography is a sequence of steps or that a musical composition is a series of notes. The fact is that a recipe, a diagram, a staff - these are only media through which the work (the dish, the dance, the symphony) is permanently expressed. It is the media that allow us to record, communicate, retain works that would otherwise be ephemeral and transitory. Cooking belongs to the performing arts and, like these arts, the social survival of the culinary performance (the dish, the meal as a whole) depends on other media (Buccafusto 2007: 1139).

Can authorship be claimed for whipped cream? Obviously not. Most of the dishes in most restaurants are based on recipes from what we might call the culinary public domain. In other words, these recipes have been followed for years, or even generations, and their original creators are unknown. Everyone would probably agree that updates to the recipes for these traditional dishes do not deserve to be considered for creative exclusivity. Furthermore, theoretically, what impedes such consideration is not a recipe's antiquity or its anonymity. That does nothing more than move the question back in time. Could the first person who made whipped cream (it is said that was Vatel) have claimed exclusive use based on its creativity? The response would continue to be no. Whipped cream is a discovery of how cream behaves under certain environmental circumstances - when it is stirred and aerated (whipped) it gets fluffy and expands, when it is heated it generates curd, when it coagulates it clots and this lump when dried and pressed develops a crust on the outside that preserves the cream in a solid state resulting in what is generally called cheese. The behaviour of substances under certain environmental conditions is not authorship and discovering it is not creating it. It is simply confirming it. As long as a recipe consists simply of stated facts, it is impossible to prevent its use in the public domain, regardless of the antiquity of the recipe.

This is also true in current cases in which new discoveries have revolutionised cuisine and have contributed spectacular procedures like spherification, which makes it possible to create recipes that had been unimaginable in the past. For example, agar is an alga from the seas of South Africa. It is colourless, tasteless and absorbs water in quantities 200 to 300 times its weight, forming gelatine. Its gelling power is its greatest asset as, with very little gelatine power in a large proportion of water, it creates a very hard, compact gelatine that gels with heat, as opposed to the traditional gelatine used in Europe,

gelatine leaves, which have to be completely cold to solidify. It is also important to mention that agar can gel the juice of exotic fruits (like pineapple), something gelatine leaves cannot do because of the high acidity of such products.

Chef Ferran Adrià, co-owner of the former restaurant elBulli, explained that it was on a trip to Japan when agar caught his attention, as it has been used in Japanese cuisine for centuries. The creative think-tank, elBullitaller, experimented with this substance to see how it reacted, what it caused and how it behaved - all of the facts of its existence. The actors in these discoveries say so themselves: 'When we discovered that agar-agar could withstand high temperatures, we created warm gelatines without resorting to anything other than observation' (Adrià, 2011: 1). 'Discover' and 'observe' are the words used by Ferran Adrià himself. This procedure of gelling a warm liquid gave rise to numerous dishes, like the tapa called *tagliatelle of consommé a la carbonara*, served at the restaurant elBulli in 1999. Is there creativity in observing a physiochemical process? No. Is there creativity in conceiving of a dish like *tagliatelle of consommé a la carbonara*? Definitely. Nevertheless, today you can type the name of this dish into an internet browser and get dozens of links to the recipe.

Is it the same recipe that was served at elBulli in 1999? Does that question make sense? Heraclitan paradox: Can you ever step twice into the same river? Recipes are like scores that have to be performed and every performance gives rise to a different dish, no matter how similar they might seem. In one of the segments in Paul Lacoste's series *Inventing Cuisine* (2001-2010), Pierre Gagnaire confesses that once a dish is created the hardest thing to do is to think of it in a way that can be reproduced in the kitchen of his restaurant, to conceive of a system for replicating it, knowing, what's more, that it is impossible and that not even he himself is capable of repeating that first original dish. Of course, he always has that model in mind when he performs his own recipes and he can always come fairly close to it. Up to now, cuisine has enjoyed a magical circumstance that the composers tend to be the best performers. That doesn't usually happen in music. Even musical language has invented a system that attempts to homogenise performances and make them as similar as possible to the work that the author had in mind: 'ff' (*fortissimo*), 'mp' (*mezzo piano*), 'ppp' (*molto pianissimo*). Perhaps the 'precisions', the advice for and specification of recipes could be codified like this: 'lh' (low heat), 'hh' (high heat), '5'hh-10'lh' (high heat for the first 5 minutes and then low heat for the remaining 10), and so on. This could become necessary in the future given the power and the protagonism that the conceptual part of cuisine is taking on (creative think-tanks) and how it is splitting off from the productive part (kitchen). In fact, at one point during the segment, Gagnaire tells his sous chef to remind him of the recipe! This is because he was in the middle of service reproducing a dish and not in his workshop creating: his duty was to replicate. It's hard for him, he admits.

Because recipes are considered lists of ingredients, facts of existence, their privatisation is protected by law. Their circulation cannot be stopped, and they are objects of common use. Thanks to this conceptual error, one can

replicate (or try to) elBulli's tagliatelle of consommé; in other words, one can interpret it, try to recreate it in order to relive it or re-experience it. Because the dish is a creation, while the technique of making warm gelatines is not. Culinary techniques are in the public domain, just as musical, dance and drawing techniques are. No artist can be denied the free use of linear perspective. At the same time, an author can claim authorship of an image in which he or she has made use of this graphic representation technique (Buccafusto 2007: 1132). Similarly, dishes are objects of creative expression whose objective is their flavour and which are produced using culinary techniques. Nobody can hold a monopoly on a cooking technique like boiling, roasting or frying, or like whipping or gelling, because these are physical phenomena. Claiming authorship for whipped cream in order to prevent the circulation of the recipe would be like trying to appropriate the major chord in music or the fifth position in classical ballet.

But what about a technique like spherification? No, not that one either. Nobody can appropriate a natural component (algae), a shape (sphere) or a physical phenomenon (the densification of a liquid). One can secure an industrial patent for the tools used for spherification, as was famously done with the whipping device for making foams that is now manufactured by the Austrian company iSi and distributed by Cooking Concepts (ICC). Mar Calabuig, founder of ICC, explains how the idea that is now known as GourmetWhip came to him when he saw chef Oriol Castro from elBulli use the whip cream canister she was selling to make foams :

> I realised that this bicycle that we were selling to whip cream was actually an aeroplane [...] The first thing that occurred to me was to make a recipe book in which we explained the technique and gave some recipes, we'd include the name and image of Ferran Adrià and we'd pay Ferran a royalty for every canister we sold. The Austrians at iSi didn't want to give up a cent because they said they didn't pay for ideas (Valsells 2012).

As this example shows, inventions don't have copyrights, what they have are commercial exploitation rights. The heads of iSi are clear about this: They don't pay for ideas. They pay for inventions, because they are manufacturers and an idea can't be manufactured. It's clear that technologies are human progress and it would be nice if they were put within everyone's reach and that it is important to help inventors share their these technologies instead of keeping it secret so that they alone can use it to their profit. To avoid this secrecy, inventors are given exclusive trade use rights for their invention for a certain period of time, during which the inventor has nothing to lose by explaining his or her findings and, when the period has passed, he or she no long cares that it becomes subject to free common use because sufficient profit will have already been gained in the exclusivity stage. Not long ago, a controversy arose about the aspirations of the late chef Homaru Cantu (Moto Restaurant, New York), who wanted to patent a process for printing edible paper that he thought could alleviate world hunger or

feed astronauts on space missions. And he was able to seek a patent because it was for a food technology and not a cooked food (dish) or the compositional elements of a dish (recipe) (Boccafusco 2007: 1132).

Ferran Adrià has repeated *ad nauseam* that molecular gastronomy is nothing more than science and cooking is a different thing entirely. Today these scientists of molecular gastronomy are trying to establish once and for all the formulas for the process of culinary phenomena. They strive to 'model dishes' to reach a universal scientific language similar to that of chemistry or music, a linguistic code that they call 'CDS formalism'. The project is very similar to what the elBulli Foundation is doing, which they call 'decoding'. But, this *decoding* is actually *coding*. Cooking has notes (ingredients), a staff (physiochemical processes), a melody (combinations of the previous two with expressive intentionality), a harmony (expressive combinations considered to be innately pleasant), and musical forms (salad, custard, purée, sorbet, soup, etc.). It just has to be codified.

In cooking, this raises questions like what would carpaccio be, a staff or a musical form? In other words, is it a cooking procedure or a ready-made compositional structure? Or, for example, gazpacho would be a chilled soup, wouldn't it? But if it were chilled even further would it be a sorbet (of gazpacho)? If it were significantly thickened would it become a custard (of gazpacho)? How can the ingredients, culinary techniques, cultural conventions of cooking be arranged to achieve a more or less agreed upon taxonomy? In part, the Bullipedia project depends on coding because definitions can't be established if there is not first a structured culinary system in place.

Might it be said that, sadly, recipes are an open-source code precisely because they have not yet been codified? That if humans ever manage to codify culinary language, that the golden age of openness of culinary design will end? Might those voices that consider it necessary to in some way protect monetary investments made for the development and publication of recipes be able to put forth scientific arguments to establish regulations? Regardless of whether culinary language is codified or not, the status of a recipe will not change: It is open design. And it has the same condition as a designer's plans. The recipe is the native file format used to create the chef's design.

So, what chef would want to share his or her recipes? All of them would! Cooks all over the world have passed on their recipes for centuries. It is said that it is part of the 'culture of hospitality' intrinsic to cooking. In the words of the late Charlie Trotter:

> *[Cooking] is about caring for and loving the foodstuffs you're working with and caring for and loving the people you are cooking for. Preparing great-tasting, nutritious food merely stems from the desire that is present in each of us to do something truly special for family, friends, and even those we may not yet be acquainted with* (Buccafusco 2007: 1152).

Appropriation is as inherent to cooking as hospitality is. Culinary professionals have always appropriated and have self-regulated the practice through common sense. The International Association of Culinary

Professionals publishes a code of ethics that requires recognition of the appropriation of a recipe (‘based on’, ‘inspired by’, ‘adaptation of the recipe by’), prohibits a chef from making an exact copy of another’s recipe and, if a chef reveals secrets about his or her procedures, these cannot be made public without that chef’s consent. The culinary community establishes the boundaries of appropriate behaviour in the professional world by appealing to values that do not need regulation because they are governed by conscience (IACP, 2015).

Today, the desire to capitalise has multiplied the enquiries, requests and demands to modify the law that protects the free circulation of recipes. Some want to modify the intellectual property law to include recipes, which would penalise their copy, sale or distribution. At the moment it is still possible to freely compile other people’s recipes and (to paraphrase Diderot speaking of the objective of an encyclopaedia) to transmit those recipes to those who come after us for the purpose of ensuring that the work of past centuries is not rendered useless for the centuries that follow, that our descendants, by becoming more learned, may become more virtuous and happier, and that we do not die without having merited being part of the human race (Diderot 1775: 635). Fortunately for all of us and for our species, recipes continue to be an open-source design.

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