WHAT VALUE FOR THE CREATIONS OF THE SHARING ERA ?

François DRUEL*, francois@francoisdruel.fr, Henri SAMIER**, samier@istia.univ-angers.fr
* Consultant – FD Conseil, 7 rue Félix Faure, 75015 Paris – http://www.francoisdruel.fr et chercheur associé au LAMPA, Arts et Métiers ParisTech Angers , France, tel : +336.74.25.81.59
** Enseignant, directeur ISTIA Innovation & Master Information Stratégique
ISTIA Innovation, Université d'Angers, 62 avenue notre dame du lac, 49000 Angers – France, tél. : 33 (0) 2 41 22 65 49
et chercheur au LAMPA, Arts et Métiers ParisTech Angers.

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Abstract

The goal of this article is to look for a new model for evaluating innovation created by online communities. Online communities are made of both people and tools. For us, if the use of tools generates innovation, the value creation resulting from this process and these interactions can be evaluated, giving analysts a view on the project value. The model we describe in this article is dedicated to industries and finance companies wishing to invest into community-based projects. Our targets are investors and people wishing to evaluate community-based projects. Our model can also be the basis for establishing a rating system allowing a ranking. We describe the sharing era as a new paradigm for online community-based innovation and establish a model for evaluating the value of innovation projects from these communities. Online communities of the sharing era generated new ways of innovating by using tools of new generation that leaded to new practices and new acheivements (Open Source software, electronic sociability, Creative Commons licence, etc). These new practices are disruptive especially as far as value is considered because the traditional economic approach based on rights, patents and other protection methods is no longer valid, as it is the case for other evaluation methods (balanced score cards, skandia navigator, traditional economic approaches,…). The value generated by online communities cannot be evaluated from a strictly economic point of view because the value is also in the organisation itself and in the interactions it creates. It is why a new evaluation model is needed. Our works are based on a french methodology, VIP (stands for Valeur Instantanãe et Prospective, Instant and Prospective Value) dedicated to evaluate real assets of organisations. Attractivity and sustainability are the main axis of the system we take as an example for building our model. We will give a definition of online comunities (general characterictics and different tools), then establish what innovation can be for the sharing era and what evaluation models are available today before describing a new evaluation model, dedicated to defining the value of innovation originating from online communities. As a conclusion, we give the first results of our approach based on an experimentation we made on a web-based community.

1 Introduction

Electronic communities are not a cyber spring chicken anymore ! This subject has been considered from many points of views for a long time now. From a marketing point of view, these communities bas been considered for long as a value-creation phenomenon hagel-netgain. In this case, electronic community are not considered for themselves but as another tool for business development. Many of these communities, indeed, are nothing else than a new form of lobbying and alternative forms of customer support.

Apart from this commercial approach, many non-commercial electronic communities appeared around projects and generated innovations of a different kind : people together created new pieces of software, giving Open Source approach a reality. They exchanged information and gave birth to new phenomenons like Creative Commons and Web 2.0. They leaded projects such as Mozilla's Firefox and Wikipedia or Linux. The very basis of these projects and organizations is information exchange. Information can be considered as the raw material of these electronic organisations. Moreover, these new practices gave birth to a new paradigm : in the old world information was a rare good to which one could give a positive economic value. in the new cyber world, information is everywhere, shared between sites and forums, spreaded throughout communities, blog networks etc. In a word, information by itself can no longer have an economic value. Yet, the value has to be found elsewhere (in organisation and exchange, for example) and we have to admit that all these projects are of a high innovation level and gave birth to major acheivments : RSS format, CSS or shared encyclopediae, e.g. All these projects have value by themselves.

If we accept this postulate, the value created by online electronic communities can be evaluated and, if it is the case, we may find criterias allowing to establish a scientific approach for a method dedicated to determining the value created. Value evaluation is a necessity because if these projects want to survive they will have to find resources, on a recursive basis. How can a project find resources with no evaluation method ? On their sides, investors (such as banks or funds) do not like to miss business opportunities ; but they need tools for evaluating the value of such projects.

Nowadays, tools and methods exist to evaluate the value of a traditional business project : analysing the business plan or the results one can easily establish ratios and indicators to determine if investing in such or such project makes sense and, even perhaps establish an investment strategy goal or return on investment. But, how can one determine such factors and information for a non commercial product ? How can we evaluate OpenSource projects and other non commercial initiatives that are creating value on the net ? Our goal is to establish a evaluation method. For acheiving this goal, we first need to describe what we call the sharing era, the world where all occurs, then what evaluation method we can use and, we will describe an experimentation we made for evaluating the value of a community.

2 The sharing era

Internet considered as a media makes possible the cohabitation of two worlds : on one hand, the one that leaded to the business Internet, made of advertising-funded sites, marketing initiatives and other commercial activities and, on the other hand, another one, non commercial, issued from personal uses, made from people initiatives, and that leaded to personal Web sites, forums, blogs. This Internet, based on uses, is the basis for the sharing era.

As Carlotta Perez noted in perez-revolutions, we entered the information age in 1971 (when Intel introduced the micro-processor) The table 1 illustrates the evolution that leaded to the information age.

Technological revolution	Popular Name fot the period	Core country or countries	Big bang initiating the revolution	Year
F I R S T	The Industrial revolution	Britain	Arkwright's mill open in Cromford	1771
S E C OND	Age of steam and railways	Britain (spreading to Continent and USA)	Test of the Rocket steam engine for the Liverpool Manchester railway	1829
THI R D	Age of steel, electricity and heavy engineering	USA and Germany forging ahead and overtaking Britain	The Canergie-Bessemer opens in Pittsburg, Pennsylvania (USA)	1875
F OURT H	Age of oil, the automobile and mass production	USA (with Germany at first vying for world leadership), later spreading to Europe	First Model-T comes out of the Ford plant in Detroit, Michigan (USA)	1908
F I F T H	Age of information and telecommuni-cations	USA (spreading to Europe and Asia)	The Intel microprocessor is announced in Santa Clara, California (USA)	1971

Table 1: Five technological revolutions, from 1770 to 1970, from [PER02]

The irruption of the Web is generally accepted as a part of this last industrial revolution, they call the information age. When one gives a glance to what has appeared on the Web from 1993 berners-lee-weaving, not many things have changed, apparently. The Web can be considered as a new media, a new way of publishing information. And in many ways, it is the case: the Web being mainly considered as a field for marketing and business as we described by Druel [DRU06] . The Web is another field for marketing and commercial initiatives. In hagel-netgain for example, the author explain how electronic communities can be used as a marketing tool for developing customer relationship. maitre-business, gives a detailed view on different kinds of business models: the authors establish a typology of different business models that are possible on the Web. This book has been massively read by start-up founders and investors.

Among business-models, the most famous is the audience-based business model : if a Web site has a large audience, it can earn money by the way of advertising sold on a per-view basis. The more services you provide on your site, the more audience you have, and the more advertising you'll have. As a consequence, many information services became of more and more use. This economic approach of the Web is by far the most well known, the one that leaded to the Internet financial

bubble and that gave birth to the Web industry, but apart from this aspect, another emerged : the Web has been a place to share information. Web users are able to share information with one another. Publishing has not been as difficult as it used to be, and many people gave birth to what is the Web today : a place where information is no longer a valuable good on which one can establish a business, simply because it is not rare any longer. Information by itself used to have value by itself, but today, added value is key . Information can be a pretext used to attract audience sold via advertising or other kind of business. These phenomenons, described by maitre-business, are still massively used today on the Internet.

Apart to these commercial uses of the Internet, emerged other ones, made of cooperation and collaboration, leaded by people and good will. Uses that made forums and blogs possible. Uses that develop peer-to-peer applications and other collaborative projects such as Wikipedia . In all these considerations, access to the knowledge is key.

Blogs are a good example of this new revolution. As described in Druel [DRU05], this phenomenon is not leaded by technology but by users and the aim of this revolution is the fact that presentation and content are strictly separated, allowing syndication i.e. the revolution of intellectual rights. Syndication is standard in blog technology, so writing a blog implies that, as an author, the blogger accepts to be copied elsewhere at any time. The consent is implicit and that is the revolution. Other examples are Open Source software and Free software . As discussed in Druel [DRU06], it gave birth to a large number of innovations, among witch many major ones (Linux, e.g. is open source sofware and has a 75.20% market share on the 500 top servers on the planet). The Free Software Foundation goes a step further, with the idea that apart from a development method, freedom is also a philosophy, and that software can be the basis of a new sociology, based on the user's freedom yo use software and not only the developper's freedom to code, this point is detailed in an article by Richard M. Stalmann [STA07] :

This points out the complexity of our approach : we have to address both the technical point of view and the philosopical (or ethical) point of view. The challenge being how can we evaluate the value of innovation without hurting the very aim they give to themselves. The four freedoms of free software are :

> • The freedom to run the program, for any purpose (freedom 0).

> • The freedom to study how the program works, and adapt it to your needs (freedom 1). Access to the source code is a precondition for this.

> • The freedom to redistribute copies so you can help your neighbor (freedom 2).

> • The freedom to improve the program, and release your improvements to the public, so that the whole community benefits (freedom 3). Access to the source code is a precondition for this.

As we see, the model is community-based by itself, or, it implies a community. The OpenSource model, as defined by the OpenSource Definition is a little different as far as it does not insist on freedom. It is commonly accepted that OpenSource software is too limited to survive. We can give many examples of non commercial initiatives (such as Firefox or VLC, Gimp or N—Vu, Open Office). All these projects are innovative and they have value by themselves. In a way, we consider they changed deeply their ecosystem and it is why such phenomenons cannot be considered as a part of another revolution ; we consider the Web not as a part of another era but as a new revolution by itself giving birth to its own era (see table 2).

Technological revolution	Name given the period	Country where the phenomeno debuts	Starting point	Year
S I X T H T	the Sharing Era	Europe,followed by global extension	Tim Berners-Lee publishes his researches on HTTP protocol and HTML langage	1992

Table 2 : The sharing era, sixth technological revolution

All these projects (at least the major ones) share a common characteristic : they are community-based. They are not the creation of a single programmer (despite the fact they can have a emblematic leader, or any kind of guru, projects are made by teams). Working in teams spreaded throughout the planet means that the projects have to use communications tools and have to get organized if they want to deliver a result.

Project	Team Leader	Number of participants	Marketshare or equivalent (when available)
VLC	Laurent Aimar (ECP)	53	More than 30 millions downloads (3.9 downloads per sec.)
Firefox	Brendan Eich	23 000	31.1 % in Europe
Open Office	Depending on projects projects.openoffice.org	34 000	14% in large accounts and a total of 62.5 million downloads
Wikipedia France	Pierre Beaudouin (Wikipedia local chapter chairman)	518,571 (of which 179 sysops)	746,000+ articles in french
N|Vu	D. Glazman	one, + additional support from Linspire	more than 2 millions

Table 3: Data about collaborative projects (jan. 09 2009)[1]

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[1] Sources : for Firefox, see Xiti Monitor, december 2007 (in two european countries out of three, Firefox is leader). For OpenOffice, see http://wiki.services.openoffice.org/wiki/Market_Share_Analysis, for N—Vu, see http://www.nvu.com/

Another characteristics is that these projects needs means of existence. It is trivial but, if they want to survive, all these projects needs to fuel their existence. Today, all these projects are donation-run. It can be efficient but it is always complicated because the distribution licences they use are not adapted to commercialization.

All these projects are innovations by themselves : technical innovations, sociological innovations and organizational innovations. They are used by millions of people around the planet, they run leading services and they are changing the way we see software. In a certain way, they redefine the classical approach of innovation .

Moreover, the innovations from the sharing era are disruptive as far as value is considered: firstly because the distribution license they use (any of the GPL variants, Open-Source or even Creative Commons) is not de dedicated to protecting intellectual rights on a commercial creation but on organizing the spreading of a product all over the networks to the people needing it. One of the most important consequences is that all these pieces of software are available for free. As fas as they are not produced by companies and they do not generate any money, establishing their value is a big problem. Indeed in spite of their freedom, we cannot say they have no value. Our question, though is this one : how can we establish a method allowing us to evaluate the value of innovations issued from the sharing era ?   As they are not dedicated to business and making money, these projects cannot be evaluated from a strictly economic point of view. We have to evaluate their organizations to have an idea on their value.

3 Existing evaluation methods

Innovations from the sharing era are at the crossing of business and engineering : most of them are technical products and they compete with commercial products . Value evaluation methods exists in both worlds. D. Andriessen [AND04] gives a detailled analysis of more than 20 existing methods, mainly from the business world. We focus on some of them. Finally, we found a method dedicated to value evaluation of organisations, that we present in ?. This method focuses on what it calls the real capital of organisations that we will define in ?

The business world focuses on quantitative methods and we found many methods, and we would like to focus on the following (cited by [AND04]) :

Neo-classical vision : Described by Gary Becker , [BEC57] this method is primarily dedicated to industrial innovation. The neo-classical economists give a mecanist vision and postulate that the only target for a company is maximum profit. The human factor is reduced to a kind of production factor acting as a machine tool.

Balanced score cards : The balanced score cards method was established in the 1990's by Robert Kaplan and David Norton. The aim of the method is to establish a strategical dashboard but it uses only quantitative criterias and does not include the human factor at all. Other methods : A number of other methods exist, of which Skandia's navigator and Karl Sveiby's but they all miss to give a strong focus on human factor and use quantitative indicators that do not allow to evaluate immaterial factors of organizations that give birth to innovation.

In the engineering world, we focused on value evaluation method dedicated to network tools, because as we said one of the major characteristics of projects of the sharing era is that they are strongly linked to networks : technical network (the Internet being the main one), human networks and competence networks.

Sarnoff law : Issued from the world of broadcasting on TV and radio networks, Sarnoff's law is trivial : audience raises as audiences accumulates. It can be formalized as n+n. Metcalfe's law : One of the most famous laws dedicated to telephone network, defined by one of the inventors of the ethernet protocol. the law states that the value of a telecommunications network is proportional to the square of the number of users of the system. It can be formalized as in figure 1 ?. The goal of this law is to determine the utility of a network. The primary target of Metcalfe's law is phone and data networks but it can be extended to social networking.

$$nX\,(n-1) = n^2 - n$$

Figure 1: Metcalfe's

This law has been discussed many times, in particular by Web-metcalfe and metcalfe-wrong. The latter article focuses on the fact that Metcalfe's law grows too fast, as they discribe on page 2 of the article. By the way, the authors propose a new law for evaluating the growth or a network : nlog(n). If Metcalfe's mathematics were right, how can the law be wrong? Metcalfe was correct that the value of a network grows faster than its size in linear terms; the question is, how much faster ? If there are n members on a network, Metcalfe said the value grows quadratically as the number of members grows. We propose, instead, that the value of a network of size n grows in proportion to n log(n). Note that these laws are growth laws, which means they cannot predict the value of a network from its size alone. But if we already know its valuation at one particular size, we can estimate its value at any future size, all other factors being equal.

Reed's Law : David Reed, in reed-law gives another law, dedicated to social networks. It is formalized as follow. Reed's law is also very discussed (see fig. 2).

$$n2^N - N - 1$$
where N is the number of nodes in the network

Figure 2: Reed's law

3.1 The VIP methodology

Business evaluation methods are not really adapted to value evaluation of innovation (see table 4). Partly because they are issued from the industrial era and partly because they are not dedicated to innovation. As a consequence, they give a partial vision of companies value. And, last but not least, they are mainly dedicated to company evaluation. Moreover, the organizations that manage projects from the sharing era are not companies. Their goals are not the same as companies. A Foundation does not have shareholders to pay ; they have a project to manage ; and for managing this project, a software foundation has to get people to work together. That's totally different.

These organization have to develop the ability to convince users to switch to their products (even if they are free), the ability to attract developers to participate in the product and the ability ti attract investors, i.e. companies that will dedicate people or money to the project. As he wanted to evaluate organizations rather than companies, A-Y Portnoff created the VIP methodology, that is the basis of our works. How can we evaluate an innovative organisation without being limited to financial, economic and industrial criterias ? For answering this question, A-Y Portnoff, a french futurologist and researcher, created the VIP Methodology, with the help of a dedicated workgroup. They published their results in the french revue Futuribles [POR03].

First of all, Portnoff gives his definition of value :

Value is (...) an attribute that we grant to something material or immaterial and that gives us an advantage , a pleasure, a service. Or the reverse if the value is negative. From a practical point of view, only the reckoning values stands and it is a an exchange value (...).

The methodology establishes a postulate:

The value is the product of synergies and not additions (...) the true value is only in exchanges and value in itself does not exists. Value is a human creation, meaning it is subjective. Value comes from interactions between ideas, people, teams, machines or between people and machines.

The method wants to reflect the value created by interactions, what Portnoff calls the real capital of organizations. Moreover, the VIP method does not refer directly to monetarization of value. That characteristic allows us to adapt the method to the projects issued from the sharing era. The two main axis of the method are attractivity and durability. These axis were chosen because the VIP methodology is dedicated to investors, and a good investment has to be attractive and durable in order to create value. An investment is not necessarily financial or economic. It can also be intangible or personal. As a first consequence, the two axis are able to

determine and evaluate the confidence one car place in an organisation. And for Portnoff, the confidence is the condition for the apparition of value. Following these two axis, we have to place evaluation criteri æthat are to be determined according the nature of the organization to evaluate, on an ad hoc basis. And that is perhaps one of the important strengths of the VIP methodology : it gives it the ability to evaluate an absolute value but a value relative to a specific context. As a consequence, one has to adapt the methodology to what one wants to do from the methodology. As a second consequence, the main difficulty will be in the ability of the users in determining relevant criteriæ in order for the methodology to give a correct vision of the value but this makes very versatile and dedicated to innovation.

Method	Quantitative approach	Industrial approach	Innovation characterization
Neo-classical vision (G. Becker)	+++	+++	---
Balanced score card	+++	+	=
Scandia's Navigator	+++	-	--
VIP methodology	---	---	+++

Table 4: Value evaluation methods comparison chart

For us, quantitative approach means that the method uses exact criteriæ, in particular economic criterieæ: turnover, investments, accounting ratios etc. The industrial approach means that the method uses mainly criteriæ issued from the industrial era (as defined by [PER02]) : production, productivity, methods, etc.. The innovation characterization consists in analyzing the innovative characteristics incorporated in an organization, a product, a method.

4 Collaborative tools available for building a community

Mailing Lists : The mail is the one of the oldest tools available on the network . A mailing list functionality is available but it is not very easy to use, does not manage archives very well, it is not easy to search a knowing database but it offers very strong moderation capacities.

Newsgroups : Newsgroups are very famous over the networks. The Newsgroup technology is very well known but the tool itself is a little clunky for a neophyte : even if modern software simplify the use of Newsgroups, it is far from easy to use. Moreover, the abilities for archiving are non existant (apart from log saving). As Mailing lists, Newsgroups are not Web-based : users need specific software to connect to Newsgroups .

Blogs : Blogs are more up-to-date tools. They are very easy to use, they have strong archiving abilities and offer good search engines, but the community management capacity and moderation are not sufficient to manage a electronic community.

Forums : Forums are very easy to use (they use a Web-based interface, like blogs), they offer strong abilities in terms of search, community management and ease of moderation. It is why we chose a forum to run an experimentation.

Tools	Ease of use	Archiving	Search capacity	Management capacities	Ease of moderation
Mailing list	xx	x	x	xx	xxx
Newsgroups	x	x	x	xx	xx
Blog	xxx	xxx	xxx	x	x
Forum	xxx	xxx	xxx	xx	xxx

Table 5: Comparison of several tools allowing the management of a community

5 An experimentation on a forum

As we said previously, many projects are community-based. But, can we evaluate the activity of a community ? Many tools are available to build a community as table 5 shows.

The objectives of the experimentation were the following :

- Can we evaluate the activity of a community using a forum ?
- Is there any correlation between the activity of the community and any law ?
- How can such an evaluation give any idea on the value of the community ?

Our goal is to evaluate the value of a community. We did not want to focus on technology. We eliminated clunky tools and chose a Web-based forum as many people are familiar with the Web. We also chose a non technological point of interest : cooking, an interest shared by many people who are not techno-geeks. We established a partnership with a famous french cooking Web site.

Many Web forum engines exist as Free sorftware or OpenSource software and even as traditional licenced-based software. We decided to use phpBB , because of its active community, its numerous options and mods available, because a french team exists, and last but not least, because it is OpenSource software… In reference to engineering laws, we decided to focus on the evolution of the number of messages according to the number of forum's members. The period of our experimentation was the time needed for the forum members to double, in reference to Metcalfe's law. When we started our experimentation, the number of member was 240. So the experimentation stopped when the forum reached 480 members. As many other Internet services, forums are subject to spamming. The method we faced consisted in member creation.

We chose to delete them, in order to focus on real activity. Indeed we did not found any automated method to totally eliminate the spams. We installed a number of mods to the forum but of them were 100 % efficient, so we deleted spam accounts on an empirical basis. Our forum being french-speaking and cooking-centered, it was not so complicated to eliminate accounts that interest were base ball, or pharmacy or any other fake interest. From the start to the end of our experimentation, we noted the number of member and the number of messages on a daily basis. As a forum administrator we had access to all technical functionalities that gave us full control on the application. We also noted the main event that occurred, such bugs (it only occurred once, due to a error in upgrading from one version to another), new sections, and new moderations options ; but we did not notice any major impact on forum activity. We started our experiment on feb. 7 2006 and we ended it on oct. 7 2006 . When we started, 4291 messages were published on the forum. When the experiment stopped, 17256 messages were present. Data collected during our experimentation shows that, at first glance, we can see that in spite a certain number of events, the evolution is regular. confirms this first observation. We have to notice that the evolution does not include spamming that we decided to eliminate.
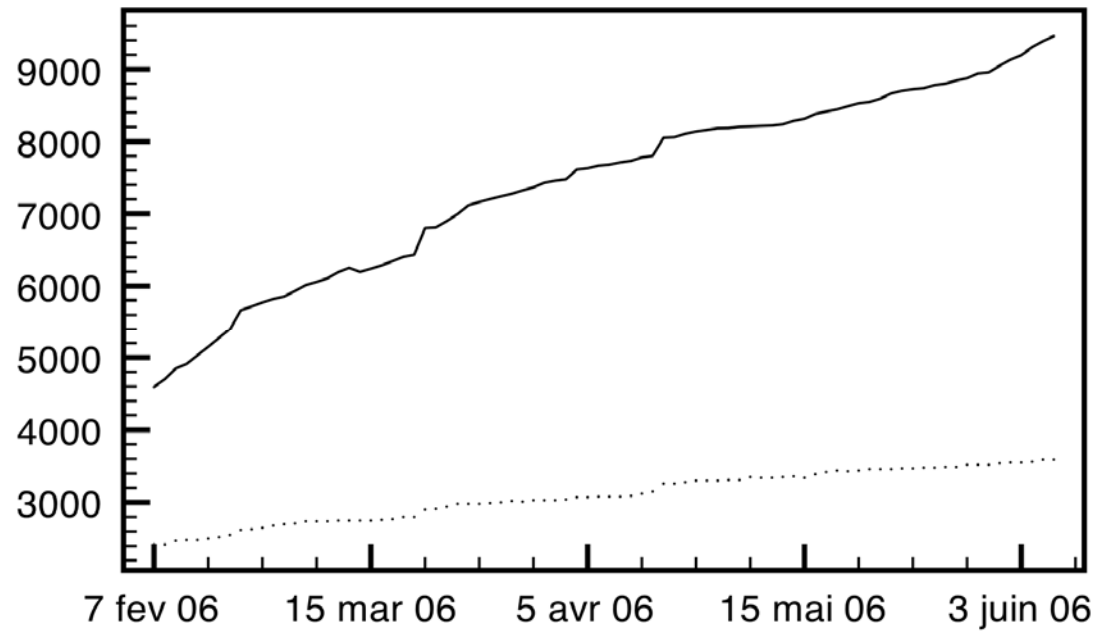
Figure 4: Graph of forum activity

Regression graph issued from our experimentation is very interesting as far as we can conclude that a correlation exists between the number of members and the number of messages exchanged on the forum. The correlation is the following :

NOMBRE MESSAGES = f(NBRE MEMBRES)

$y = 0,0037x^{1,8045}$
$R^2 = 0,9863$

$y = 0.0012x^2 - 4.0842x + 7867.9$
$R^2 = 0.992$

$y = 5,0625x - 8311,1$
$R^2 = 0,9669$

Legend:
- Nbre de Messages du forum
- Puissance (Nbre de Messages du forum)
- Linéaire (Nbre de Messages du forum)
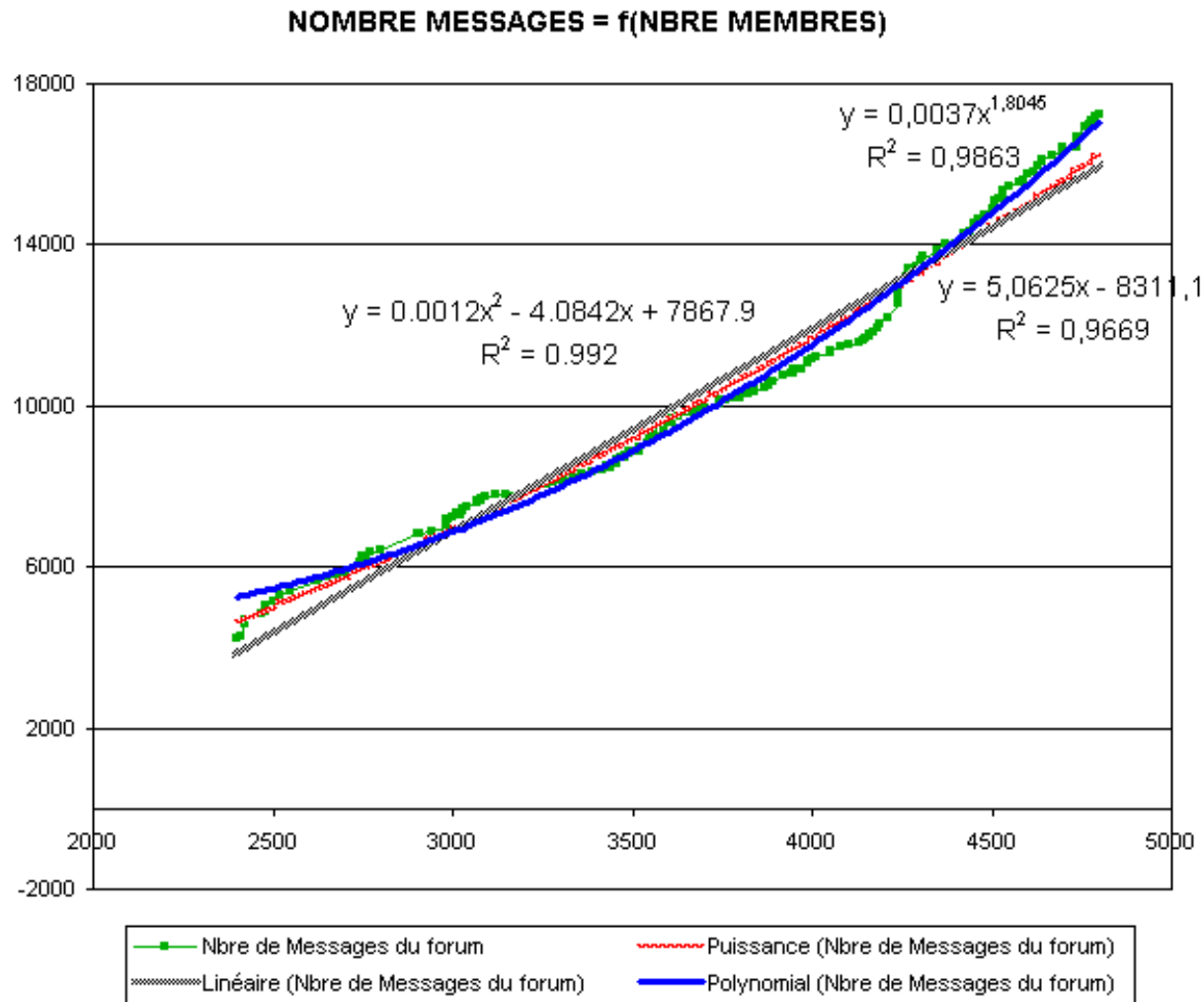- Polynomial (Nbre de Messages du forum)

Figure 5: Regression graph from our experimentation

The activity of a forum can be evaluated by means of the number of messages. When the number of users grows, the number of messages grows. Moreover, there is a corelation between the two components. As we noted during the experimentation, this growth does not seems to be linked to external events : during the experimentation, we faced a bug (1 day off duty) and three external events (Forum cited in the media and forum members present in shows, speaking about the forum activity) but the growth rate does not seem to be affected by these events. During the experimentation, we also took note of the forum's audience, measured using the external tagging method . There is no relation between forum's activity and forum's audience evaluated by page count. We can conclude that when the number of forum members doubles, the number of messages is multiplied by square. In our case, it means that Metcalfe's law is verified.

6 Discussion : towards a evaluation method ?

Our experimentation shows that a forum's activity can be evaluated. We also show that a correlation can be established between the number of members and the number of messages created. This correlation follows Metcalfe's law. This law is designed to establish the utility of a network. Utility is part of value. The forum's utility grows as the number of member grows, but, does this evaluation method says anything about the value of the forum ? The answers is no. Being purely numerical, our evaluation does not gives any idea on the community's value as pertinence is not addressed. Pertinence seems to be a major criterion and new experimentations will have to work on it.

The question of spamming is a major concern : during our experimentation we decided to eliminate spams on a day-by day basis. We saw that spams create a specific activity : robots create new accounts, and new messages. This observations leads us to postulate that a fake forum could be evaluated using the same method. We made only one experiment using only one forum. To be validated, other experimentations using other firms of forums are to be established.

7 Conclusions

Following the information age, the sharing era has established a new paradigm in which value is not based on rareness ? but on sharing. Initiatives such as Open Source and Free software paved the way to the development of this new age where value creation is based on the underlying community. Evaluation methods issued from the old world cannot be used anymore because they are irrelevant. Organizations of the sharing era are sui generis. It is why they need their own new evaluation methods.

In the experiment we made, we showed that activity on a forum can be evaluated. Nevertheless, this activity measurement is not sufficient to establish the value of the underlying community. Future experimentations are to be done to establish a model, that, we think is more than needed for the future.

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