SME's participation to Free Libre Open Source Software Communities

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To my beloved parents

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Resum

Les motivacions entorn al programari lliure han estat sempre un tema de gran interès, sent la pregunta més obvia, "perquè les persones treballen de forma gratuïta?". Les motivacions dels desenvolupadors han estat establertes (per exemple, von Hippel (2001), Lerner and Tirole (2002)). De la mateixa manera que ho han estat per a les empreses grans i petites que adopten programari lliure basat en models de negoci (per exemple, Lakhani and von Hippel, 2003; Fitzgerald, 2006; Krishnamurthy, 2004). No obstant això, un nombre cada vegada més elevat de les PIMES amb estratègies que no estan directament relacionades amb aquest model de negoci estan contribuint a les comunitats de programari lliure. En aquest estudi s'investiga les motivacions d'aquestes empreses des d'un punt de vista de comportament mitjançant un model d'investigació basat en TPB (Theory of Planned Behavior). Hem demostrat que factors com la "obertura" d'una PIME, la importància percebuda del programari lliure, els desenvolupadors (empleats) d'una PIME, juntament amb l'ambient extern, podrien influir en la decisió d'una PIME a participar en comunitats de programari lliure. A més, hem demostrat que es poden identificar algunes diferències entre empreses d'alta base tecnològica i empreses amb poca base tecnològica. Aquestes conclusions poden ajudar governs nacionals o regionals per millorar el disseny de polítiques per tal d'incentivar l'ús i la participació de les empreses en les comunitats de programari lliure. Especialment ara, degut a la forta crisi econòmica que pateix Europa, el programari lliure pot ser una solució adequada per a fomentar la innovació.

Abstract

Motivations in FLOSS have always been a subject of great interest, by starting with the most obvious question, "why people work for free?". The motivations of developers have been well established (eg von Hippel (2001), Lerner and Tirole 2002). The same exists also for big and small companies adopting FLOSS based Business Models (eg Lakhani and von Hippel, 2003; Fitzgerald 2006; Krishnamurthy, 2004). However an increasing number of SMEs with strategies not directly related to the Business Model are contributing to FLOSS communities. In this study we try to investigate these motivations under a behavioral perspective by using a research model based on TPB (Theory of Planned Behavior). We demonstrated that factors like the "openness" of a SME, the perceived importance of FLOSS, the developers (employees) of a SME along with the external environment of a SME, could influence the decision of a SME to participate in FLOSS communities. Also, we have demonstrated that some differences can be identified between high tech firms and non high tech firms. These findings can help national or regional governments to design better policies in order to better promote the use and the participation of firms to FLOSS communities. Especially now, in times of heavy economical crisis in Europe, FLOSS can be an adequate solution to foster innovation.

Published work

This section summarizes the evolution process of this thesis work, and indicates the published papers on each stage.

Formulation of the research model:

- Batikas, M., "Analyzing Firms' Behaviour towards Free Libre Open Source Software Communities", OSS 2009 Doctoral Consortium, Skövde, Sweden, pp. 11-22, 06/2009.

- Batikas M., Miralles F. "Firms' Decision to Contribute to Free Libre Open Source Software Communities", Business & Information Technology (BIT) 4th Ed International Conference, 'Mastering IT in Business', Barcelona, 12th & 13th June, 2008 (http://www.iese.edu/es/ad/Eb-Center/BITconference/BITConference.asp)

- Batikas M., Miralles F. "Firms' Decision to Contribute to Free Libre Open Source Software Communities", 16th European Conference on Information Systems (ECIS), Galway, Ireland, pp. 1478-1487, 06/2008

- Batikas M. "Firms' Decision to Contribute to Free Libre Open Source Software Communities", Workshop on open innovation organized by the Programme on Regional Innovation, which is a joint-programme of Cambridge University and MIT, Cambridge, UK, 2007 (http://www.regionalinnovation.org.uk/events/article/default.aspx?objid=2358

- Batikas M. "The Ecology of FLOSS 2.0: Attractiveness from outside the "Community". A Confirmatory Analysis" NITIM (PhD network on Networks, Information Technology and Innovation Management), Dublin, Ireland, 5-8 September 2007.

- Batikas M. "New business models in the FLOSS 2.0" European Conference on Information Systems (ECIS) Doctoral Consortium, St. Gallen, Switzerland, June 2007

Presentation and analysis of the obtained results:

- Batikas M., Oliver M., Almirall E. "Promoting participation of SMEs to Free Libre Open Source Software Communities", submitted to TPRC 2011 Telecommunications Policy Resarch Conference to be held in Washington DC, September 2011.

- Batikas M., Oliver M., Almirall E. "Participation of catalan SMES IN FLOSS communities", accepted to EURAM 2011 European Academy of Management Conference on *Management Culture in the 21st Century* to be held in Tallinn, 1-4 June 2011.

Other publications related to this research work:

- Oliver, M., J. Zuidweg, and M. Batikas, "Wireless commons against the digital divide ", IEEE International Symposium on Technology and Society ISTAS2010, Australia, IEEE, 06/2010.

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1   INTRODUCTION

Despite fears about lack of technical support or commercial viability, European firms have been actively adopting open source solutions over the last years. Today, almost 40% of companies already use some type of FLOSS. Utility and telecommunications firms, media companies, and public sector bodies lead enterprise adoption by a wide margin. Forty-five percent of the firms using open source have deployed it in mission-critical environments, although the vast majority (70%) uses it for non-key applications. (Mendez, 2005).

So, on one hand we have clear evidences that European firms (multinational and SMEs) are adopting Free Libre Open Source Software (FLOSS) solutions either for crucial processes or not, but on the other hand we still observe the phenomenon that the vast majority of the FLOSS developers are still individuals. According to the latest EU study, at the end of 2005, 61.2% of code of FLOSS projects had been developed by individuals, according to copyright and credit claims, while 19.2% was claimed by companies, 5.6% universities, and 7.9% by non-profit foundations. But, this situation seems to be changing since more and more key players of the IT industry are declaring their strategy to support and contribute to the FLOSS community.   IBM, for instance, estimates spending in excess of $100 million annually on Linux development now, although this includes maintenance and forms of participation other than just writing code (Ghosh, 2006), like promoting, translating and supporting.

As Fitzgerald (2006) mentions about the transformation of FLOSS to FLOSS 2.0, FLOSS 2.0 development life cycle strategic planning moves to the fore. The principle of individual developers, developing FLOSS on on-demand basis, is superseded by corporate firms considering how best to gain competitive advantage. As a consequence, a shift is occurring whereby the management of the

development process is becoming less bazaar-like. In FLOSS 2.0, the emphasis is firmly focused on market creation through a loss-leader approach and involves products with dual licensing, cost reduction and accessorizing. This transformation, as Agerfalk and Fitzegerald (2008) mention, can lead to the creation of a symbiotic ecosystem where the goal should be the operation of customers and community participants as equals with neither party dominating.

We observe that FLOSS is shifting the last years from a model driven purely by the developers' community and universities support to one where the main driver is industry. There has been done an extensive analysis about the developers' motivations (Lerner and Tirole, 2002, Bonaccorsi and Rossi 2003, Riehle 2007 and Fei-Rong Wang, Dan He, & Jin Chen 2005), but on the other hand the firms' behavior on contributing to FLOSS communities has not attracted so far a lot of attention. Having in mind the above observations, why firms choose to contribute to FLOSS communities and not choose to follow a free-rider approach? According to this new FLOSS ecosystem that is described by Fitzgerald (2006), how firms can be part of this "user community" and how can they benefit from their participation in order to gain a competitive advantage? This question is getting more interesting, since according to Dahlander (2004) the FLOSS community protects the commons from being depleted by commercial firms, so firms that attempt to appropriate returns from FLOSS ought to use different strategies to appropriate returns than in private goods. Finally, this research, mainly, aims at shedding a light at the motivations of firms on contributing to FLOSS communities and the way they are contributing to them. In other words and with more details how a set of independent variables of this research (Firms' involvement in FLOSS, FLOSS products, Developers' intrinsic and extrinsic motivation, Commons and Free Libre Open Source Software), which are described in the next chapters, can affect the dependent variable of this research, which is the firms' contribution to FLOSS communities. In addition to that, is the phenomenon of the Tragedy of the Commons going to affect the contribution of

firms' to FLOSS communities and the relationship between individual developers and firms?

2   LITERATURE REVIEW

By analyzing the current literature about FLOSS, it can be concluded that we can divide it into four main blocks or themes. The first block covers the way firms try to contribute to FLOSS communities and the relationship with the FLOSS communities. The second block is about the different FLOSS products and the differences between them. The third block covers the literature about the motivations of the individuals developers and the fourth main block covers the subject of FLOSS Commons, or in other words the connection between the model of Tragedy of the Commons proposed by Hardin (1968) and FLOSS. We tried to analyze the current literature by using a concept-centric approach.

2.1 Firms' involvement in FLOSS

Teece (1986) argue that in industries with weak appropriability regimes, the ownership of complementary assets determines profits. And this is the case also with FLOSS. Firms' try to "manage" or to influence open source communities, as complementary assets, in order to achieve profits or to decrease their gap with the leader in their industry (loss leader strategy). But how they try to get benefited (benefited in any way the firms want)? Do they support open source communities? And Why?

Dahlander and Wallin (2006) support that firms need to access the developers of the FLOSS community and try to convert the knowledge created in the FLOSS community into a complementary asset. They also argue that firms, in order to be able to utilize FLOSS community as a complementary asset, are required to give away a great amount of other resources that could also be part of their complementary assets. This happens due to the fact that many times FLOSS communities safeguard their work from being appropriated by firms.

In addition, property and decision-making rights affects the perception of fairness by the developers of the FLOSS community, which in turn affects their behavior (Shah, 2006).

Also, Osterloh et. al. (2003) have found that firms must gain the confidence of the community by providing evidence that they fully respect the rules defined by FLOSS licenses and the non-written rules of FLOSS movement.

And the relationship between the community and the firms can be easily broken. The results of the study of Oh and Jeon (2007) revealed that participation is significantly reduced in the presence of strong external forces. Regardless of network connectivity, small networks are found to be very fragile when faced with an external force; even a small change in the force can dramatically break up the existing network, triggering the community to become very inactive and eventually disappear. These results provide some support for the difficulty of establishing and maintaining a "critical mass" in virtual communities (Markus et al, 2000; Butler, 2001) and the managerial challenges faced by FLOSS leaders (Healy and Schussman, 2003). And once some key developers leave the community, a snowball effect is possible to take place leading to rapid abandonment of the project (Oh and Jeon, 2007).

Oh and Jeon (2007) try to explain this phenomenon by arguing that conflicts over personal, technical and strategic issues may arise between a company that participates in a FLOSS project and the members of this community due to differences in orientation, motivation and attitude.

On the other hand, Bonaccorsi et. al (2006) argue that the main returns of a company participating in contributing in a FLOSS project are commercial viability and technological learning. The active participation of firms in the FLOSS community will enable them to collect information products, services, and customers which eventually may lead them to the opening up of new market niches. However, it must be drawn into consideration that by making the source code available may provide advantages to their competitors.

In their analysis they consider 5 variables which indicate the adopted business model, (i) open source turnover, (ii) open source products, (iii) types of offered solutions, (iv) strategic importance of FLOSS and (v) intensity of use of GNU GPL license.

2.2   FLOSS products

Krishnamurthy (2003) refers to the fact that not all FLOSS products have the same high potential profit. In order to analyze the profit potential of an FLOSS product, he uses two dimensions - customer applicability and relative product importance. So, four categories of FLOSS products are produced, High profile nichers (low customer applicability and high relative importance), STARS (high customers applicability and high relative product importance), Low-profile nichers (low customer applicability and low relative product importance) and mainstream utilities (high customer applicability and low relative product importance).

Applications for sophisticated users have higher chances of evolving towards a stable release (Comino et. al., 2007). Comino et. al. (2007), also observe that, the presence of commercial firms has become more and more pervasive in FLOSS projects and it is likely that the rationales, the modes of contributing as well as the interactions with the rest of the community differ between commercial and non-commercial contributors. Also, the choice of the licensing terms under which the project is distributed might depend on the nature of the project.

In addition to that, Fershtman and Gandal (2007) find that the output per contributor in open source projects is much higher when licenses are less restrictive and more commercially oriented. These results indeed suggest a status, signaling, or intrinsic motivation for participation in FLOSS projects with restrictive licenses.

2.3   Developers' intrinsic and extrinsic motivation

Lerner and Tirole (2002) group the two incentives of individual developers (career concern incentive and ego gratification

incentive) into one incentive based on an economic perspective, which they call it the signaling incentive. And this incentive is stronger when it is (i) more visible the performance to the relevant audience, (ii) higher the impact of effort on performance, and (iii) more informative the performance about talent. In other words, developers will want to work to a FLOSS project that attracts or will attract many developers in order to have more benefits due to network effects.

Also Bonaccorsi and Rossi (2003) have summarized the individual developers' motivations into three main categories, (i) Scientific discovery: the production of FLOSS is a form of intellectual gratification with an intrinsic utility similar to that of a scientific discovery, (ii) Art form: besides being a form of intellectual work, hackers also regard programming as an art form. Several developers describe FLOSS development as artistic satisfaction associated with giving solutions to complex computer problems, and last (iii) Pleasure of creativity: in the new paradigm of development, developers frequently rediscover the pleasure of creativity.

Finally, Bonaccorsi and Rossi (2003) in conclusion argue, "Intellectual gratification, aesthetic sense and informal work style are all recurrent features of the set of different motivations underlying the invention of FLOSS".

2.4   The importance of Commons and Free Libre Open Source Software

The "commons" is any resource, which is shared by a group of people. Such things as the air and the water come from commons. In many parts of the world, new land for farming and grazing, land for stock, fish from the sea, and wood for fuel and housing are treated as commons.

In the digital world, we have the digital commons, which share the same characteristics with the physical commons, except the fact that digital commons have no dimensions, since they exist in a none-bounded environment (Greco and Floridi, 2004). FLOSS can be

characterized as a "commons" denoting the centrality of the absence of exclusion as the organizing feature of this mode of production and highlighting the potential pitfalls of such an absence for decentralized production (Benkler, 2002).

The phenomenon of the "Tragedy of the Commons" is best served to refer only to the case of unregulated access commons, whether true commons or commons property regimes. So, according to the latter argument, FLOSS cannot face Tragedy of the commons, which is something that Raymond (2001) also agrees.

Raymond (2001) has expressed his argument that FLOSS cannot face the Tragedy of the commons. When people reflexively apply the theory of the Tragedy of the Commons to open source communities, they expect them to be unstable with a short half-life. Since there's no obvious way to enforce an allocation policy for developer time over the Internet, this model leads straight to a prediction that the commons will break up, with various bits of software being taken closed-source and a rapidly decreasing amount of work being fed back into the common pool of resources. In fact, the trend is clearly opposite to this. The trend in breadth and volume of open-source development can be measured by submissions per day at SourceForge or announcements per day at freshmeat.net (Raymond, 2001). Volume on both was steadily and rapidly increasing.

Also Raymond (2001) has argued that the real free-rider problem in FLOSS is "more a function of friction costs in submitting patches than anything else. It's for this reason that the number of contributors is strongly and inversely correlated with the number of steps and phases each project makes a contributing user go through. Such friction costs may be political as well as mechanical"

But on the other hand as Schweik (2005) explains that in the process of sustaining and even growing a team of developers, we can observe a phenomenon of the Tragedy of the Commons. In these settings the tragedy that has to be avoided is the developer's decision to leave from the FLOSS project and abandon it. And not

because of an external factor but mainly because of an internal problem related with the project, such as conflicts over the project management, decrease of financial support, or other matters related to the management and the co-ordination of the FLOSS project. This is also supported by the research of Oh and Jeon (2007), in which is mentioned that "once some of the key volunteers have left the community, a snowball effect is expected to occur, which can lead to rapid abandonment of the project". Even a small change in the force that connects the community can break up the existing network, resulting to the inactivity of the community and eventually to its abandonment (Oh and Jeon, 2007).

So, firms, which are viewing FLOSS from a strategic point of view, have to manage efficiently the maintenance and perhaps the growing of the FLOSS project team in order to avoid a premature abandonment of the FLOSS project by its main developers.

Also, even though FLOSS can be characterized as a public good due to its non-rivalry and non-excludability characteristics (Ostrom, and Ostrom, 1977), it has owners, who are the ones that decide what is going to be into the next project's public release (Schweik and English, 2007).

Finally, as far as the success or the failure of a FLOSS project is concerned, Schweik (2005) proposed that is based on 3 attributes, (i) the stage of the project, (ii) the size of the development team and (iii) the measures of the success and failure of the FLOSS project. In addition to that, Lerner and Tirole (2002) investigate which technological characteristics are conducive to a smooth open source development. The 3 factors they analyze are (i) the role of applications and related programs, (ii) the influence of competitive environment and (iii) the project lifespan. Finally, O'Mahony's research (2003) proves that developers resist to central governance and to formal organization of the FLOSS projects.

2.5   Other

Although, the previous four blocks of themes cover the majority of the FLOSS literature, there are also some other very specific issues that can affect the firms' behavior to contribute to FLOSS communities. These issues are analyzed below.

First of all, the firm's perception of the FLOSS world and how much "open" a firm is, can affect positively or negatively the attitude of the firm towards the intention to contribute to FLOSS communities.

Yet, the stakeholders' opinion and perception of FLOSS is going to affect positively or negatively the perceived socially pressure to perform the action of contribution to FLOSS projects. In other words, the social pressure towards the intention to contribute to FLOSS communities is going to be affected positively, if lots of other competitive firms have decided to contribute to the FLOSS communities (Miralles et. al, 2006)

Finally, the size of FLOSS applications a firm uses (in terms of the amount of developers dedicated) is going to affect the perceived difficulty of contributing to the FLOSS communities. A FLOSS project with more than 5 developers can attract more developers and general contribution from individuals or firms. In addition to that, firms that use famous horizontal FLOSS applications have great difficulties in contributing, since the size of the community is large and it's more difficult to manage this kind of contribution. Also the firm's resources, in terms of economic value and human resources size, are going to affect the difficultness or the easiness of contributing to the FLOSS community.

The above blocks can lead us to the categorization of the motivations to participate in FLOSS communities in two categories. In a firm level and in an individual level.

2.6 Motivations to participate in the FLOSS movement

2.6.1 Firms

Teece (1986) argue that in industries with weak appropriability regimes, the ownership of complementary assets determines profits. This is the case also with FLOSS. Firms' try to "manage" or to "govern" open source communities, as complementary assets, in order to achieve profits or to decrease their gap with the leader in their industry.

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2.6.2   Individuals

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hackers also regard programming as an art form. Several developers describe FLOSS development as artistic satisfaction associated with giving solutions to complex computer problems, and last (iii) Pleasure of creativity: in the new paradigm of development, developers frequently rediscover the pleasure of creativity.

2.7   IT Adoption Models

This research was based to the use of an IT adoption model in order to explain the behavior of SMEs in the FLOSS world. More, especifically the Theory of Planned Behavior (TPB) by Ajzen (1991) was used as a theoritcal basis for this work. Below, this theory along with the Theory of Reasoned Action which is an ancestor of TPB are presented.

2.7.1   Theory of Reasoned Action

The theory of reasoned action (TRA), developed by Martin Fishbein and Icek Ajzen (1975, 1991), derived from previous research that started out as the theory of attitude, which led to the study of attitude and behavior. The theory was "born largely out of frustration with traditional attitude-behavior research, much of which found weak correlations between attitude measures and performance of volitional behaviors" (Hale et. al., 2003). The key application of the theory of reasoned action is prediction of behavioral intention, spanning predictions of attitude and predictions of behavior. The subsequent separation of behavioral intention from behavior allows for explanation of limiting factors on attitudinal influence (Ajzen, 1991).

Derived from the social psychology setting, the theory of reasoned action (TRA) was proposed by Ajzen and Fishbein (1975 & 1991). The components of TRA are three general constructs: behavioral intention (BI), attitude (A), and subjective norm (SN). TRA suggests that a person's behavioral intention depends on the person's attitude about the behavior and subjective norms (BI = A + SN). If a

person intends to do a behavior then it is likely that the person will do it.

Behavioral intention measures a person's relative strength of intention to perform a behavior. Attitude consists of beliefs about the consequences of performing the behavior multiplied by his or her valuation of these consequences. Subjective norm is seen as a combination of perceived expectations from relevant individuals or groups along with intentions to comply with these expectations. In other words, "the person's perception that most people who are important to him or her think he should or should not perform the behavior in question" (Ajzen and Fishbein, 1975).

To put the definition into simple terms: a person's volitional (voluntary) behavior is predicted by his/her attitude toward that behavior and how he/she thinks other people would view them if they performed the behavior. A person's attitude, combined with subjective norms, forms his/her behavioral intention.

Fishbein and Ajzen say, though, that attitudes and norms are not weighted equally in predicting behavior. "Indeed, depending on the individual and the situation, these factors might be very different effects on behavioral intention; thus a weight is associated with each of these factors in the predictive formula of the theory. For example, you might be the kind of person who cares little for what others think. If this is the case, the subjective norms would carry little weight in predicting your behavior" (Miller, 2005).

Miller (2005) defines each of the three components of the theory as follows and uses the example of embarking on a new exercise program to illustrate the theory:

Attitudes: the sum of beliefs about a particular behavior weighted by evaluations of these beliefs

You might have the beliefs that exercise is good for your health, that exercise makes you look good, that exercise takes too much time, and that exercise is uncomfortable. Each of these beliefs can

be weighted (e.g., health issues might be more important to you than issues of time and comfort).

Subjective norms: looks at the influence of people in one's social environment on his/her behavioral intentions; the beliefs of people, weighted by the importance one attributes to each of their opinions, will influence one's behavioral intention

You might have some friends who are avid exercisers and constantly encourage you to join them. However, your spouse might prefer a more sedentary lifestyle and scoff at those who work out. The beliefs of these people, weighted by the importance you attribute to each of their opinions, will influence your behavioral intention to exercise, which will lead to your behavior to exercise or not exercise.

Behavioral intention: a function of both attitudes toward a behavior and subjective norms toward that behavior, which has been found to predict actual behavior.

Your attitudes about exercise combined with the subjective norms about exercise, each with their own weight, will lead you to your intention to exercise (or not), which will then lead to your actual behavior.

Sheppard et al. (1988) disagreed with the theory but made certain exceptions for certain situations when they say "a behavioral intention measure will predict the performance of any voluntary act, unless intent changes prior to performance or unless the intention measure does not correspond to the behavioral criterion in terms of action, target, context, time-frame and/or specificity".

Sheppard et al. (1988) say there are three limiting conditions on 1) the use of attitudes and subjective norms to predict intentions and 2) the use of intentions to predict the performance of behavior. They are:

Goals Versus Behaviors: distinction between a goal intention (an ultimate accomplishment such as losing 10 pounds) and a behavioral intention (taking a diet pill)

The Choice Among Alternatives: the presence of choice may dramatically change the nature of the intention formation process and the role of intentions in the performance of behavior

Intentions Versus Estimates: there are clearly times when what one intends to do and what one actually expects to do are quite different

Sheppard et al. (1988) suggest "that more than half of the research to date that has utilized the model has investigated activities for which the model was not originally intended". Their expectation was that the model would not fare well in such situations. However, they found the model "performed extremely well in the prediction of goals and in the prediction of activities involving an explicit choice among alternatives." Thus, Sheppard et al. (1988) concluded that the model "has strong predictive utility, even when utilized to investigate situations and activities that do not fall within the boundary conditions originally specified for the model. That is not to say, however, that further modifications and refinements are unnecessary, especially when the model is extended to goal and choice domains".

Hale et al. (2003) also account for certain exceptions to the theory when they say "The aim of the TRA is to explain volitional behaviors. Its explanatory scope excludes a wide range of behaviors such as those that are spontaneous, impulsive, habitual, the result of cravings, or simply scripted or mindless (Bentler & Speckart, 1979). Such behaviors are excluded because their performance might not be voluntary or because engaging in the behaviors might not involve a conscious decision on the part of the actor".

2.7.2 Theory of Planned Behavior

The TRA has even been revised and extended by Ajzen himself into the Theory of Planned Behavior. "This extension involves the addition of one major predictor, perceived behavioral control, to the model. This addition was made to account for times when people have the intention of carrying out a behavior, but the actual

behavior is thwarted because they lack confidence or control over behavior" (Miller, 2005,).

In addition to attitudes and subjective norms (which make the theory of reasoned action), the theory of planned behavior adds the concept of perceived behavioral control, which originates from self-efficacy theory (SET). Self-efficacy was proposed by Bandura in 1977, which came from social cognitive theory. According to Bandura, expectations such as motivation, performance, and feelings of frustration associated with repeated failures determine affect and behavioral reactions. Bandura (1986) separated expectations into two distinct types: self-efficacy and outcome expectancy. He defined self-efficacy as the conviction that one can successfully execute the behavior required to produce the outcomes. The outcome expectancy refers to a person's estimation that a given behavior will lead to certain outcomes. He states that self-efficacy is the most important precondition for behavioral change, since it determines the initiation of coping behavior.

Previous investigations have shown that peoples' behavior is strongly influenced by their confidence in their ability to perform that behavior (Bandura et. al, 1980). As the self-efficacy theory contributes to explaining various relationships between beliefs, attitudes, intentions, and behavior, the SET has been widely applied to health-related fields such as physical activity and mental health in preadolescents, and exercise.

As Ajzen (1991) stated in the theory of planned behavior, knowledge of the role of perceived behavioral control came from Bandura's concept of self-efficacy. Recently, Fishbein and Cappella (2006) stated that self-efficacy is the same as perceived behavioral control in his integrative model, which is also measured by items of self-efficacy in a previous study (Ajzen, 2002).

In previous studies, the construction and the number of item inventory of perceived behavioral control have depended on each particular health topic. For example, for smoking topics, it is usually measured by items such as "I don't think I am addicted

because I can really just not smoke and not crave for it," and "It would be really easy for me to quit."

The concept of self-efficacy is rooted in Bandura's (1977) social cognitive theory. It refers to the conviction that one can successfully execute the behavior required to produce the outcome. The concept of self-efficacy is used as perceived behavioral control, which means the perception of the ease or difficulty of the particular behavior. It is linked to control beliefs, which refers to beliefs about the presence of factors that may facilitate or impede performance of the behavior. Namely, it tries to measure the confidence toward the probability, feasibility, or likelihood of executing given behavior.

The theory of planned behavior specifies the nature of relationships between beliefs and attitudes. According to these models, people's evaluations of, or attitudes toward behavior are determined by their accessible beliefs about the behavior, where a belief is defined as the subjective probability that the behavior will produce a certain outcome. Specifically, the evaluation of each outcome contributes to the attitude in direct proportion to the person's subjective possibility that the behavior produces the outcome in question (Fishbein & Ajzen, 1975).

Outcome expectancy was originated from the expectancy-value model. It is a variable-linking belief, attitude and expectation. The theory of planned behavior's positive evaluation of self-performance of the particular behavior is similar to the concept to perceived benefits, which refers to beliefs regarding the effectiveness of the proposed preventive behavior in reducing the vulnerability to the negative outcomes, whereas their negative evaluation of self-performance is similar to perceived barriers, which refers to evaluation of potential negative consequences that might result from the enactment of the espoused health behavior.

The concept of social influence has been assessed by social norm and normative belief in both the theory of reasoned action and theory of planned behavior. Individuals' elaborative thoughts on subjective norms are perceptions on whether they are expected by

their friends, family and the society to perform the recommended behavior. Social influence is measured by evaluation of various social groups. For example, for smoking issue, (1) subjective norms from peer group include thoughts such as, "Most of my friends smoke," or "I feel ashamed of smoking in front of a group of friends who don't smoke"; (2) subjective norms from family include thoughts such as, "All my family smoke, and it seems natural to start smoking," or "My parents were really mad at me when I started smoking"; and (3) subjective norms from society or culture include thoughts such as, "Everyone is against smoking," and "We just assume everyone is a nonsmoker."

While most models are conceptualized within individual cognitive space, the theory of planned behavior considers social influence such as social norm and normative belief, based on collectivistic culture-related variables. Given that an individual's behavior (e.g., health-related decision-making such as diet, condom use, quitting smoking and drinking, etc.) might very well be located in and dependent on the social networks and organization (e.g. peer group, family, school and workplace), social influence has been a welcomed addition.

As Ajzen (1991) describes "Intentions to perform behaviors of different kinds can be predicted with high accuracy from attitudes toward the behavior, subjective norms, and perceived behavior control; and these intentions, together with perceptions of behavioral control, account for considerable variance in actual behavior."

So, the TPB model sets three independent factors of intention of behavior (Ajzen, 1991). Attitude toward the behavior is defined as the individual's positive or negative feelings about performing a behavior. It is determined through an assessment of one's beliefs regarding the consequences arising from a behavior and an evaluation of the desirability of these consequences. Subjective norm is defined as an individual's perception of whether people important to the individual think the behavior should be performed.

The contribution of the opinion of any given referent is weighted by the motivation that an individual has to comply with the wishes of that referent. Perceived behavioral control (PBC) is defined as one's perception of the difficulty of performing a behavior. In our case the behavior is the participation of firms in FLOSS communities. But this participation can be viewed into two different versions. The first version (Active Participation) is about the fully commitment of a company to a FLOSS project, in which case a firm will participate in the management of the project, in the development and the implementation of the software and in some case in the promotion of the project. The second version (Supporting / Funding participation) can be observed when companies do not contribute at all in the development of the project and they only try to help by funding the project, supporting it through promotional activities or testing the software.

3 RESEARCH MODEL AND METHODOLOGY

3.1 Research Model

In order to investigate the behavior of firms, we are going to use an extended model of the Theory of Planned Behavior (TPB).

The Theory of planned behavior is a well-researched intention model that incorporate grounded concepts and principles. As TPB describes an active, deliberate decision process within the constraints of social expectations and limited resources, can be really useful for studying the decision to contribute to FLOSS communities in SMEs (Harrison et. al. 1997). So far, TPB has been used to various studies analyzing the decision making in a firm level (Harrison et. al. 1997, Riemenschneider et. al., 2003, Elliot and Jobber,1995, Guido, 2001). But in order to use TPB in a firm level some assumptions and preconditions of its applicability that has to been taken before using it in a firm level. First of all, for the TPB to be the relevant, executives must connect a decision to contribute to FLOSS communities with meaningful outcomes for their firms (Harrison et. al. 1997). Another important assumption of the TPB is that it applies to individual decisions. So, we use and test the theory with regard to decisions made by individual executives in a SME, rather than to a top management team of a large firm (Harrison et. al. 1997). The level of how accurately these individual decision processes reflect firm level decision making is an important concern that this research attempted to address. First, the fact that our investigation deals with SMEs (half of them having only 1 or 2 employees) reduces potential conflicts between individual level and firm level decisions. Also, this research was addressed to respondents whose job title proved that they were the only ones or the primary decision makers regarding strategy and IT decisions. Also, TPB has been used to FLOSS research regarding

the reuse of code in FLOSS projects (Sojer and Henkel, 2011). Finally, TPB has been widely used in analyzing behaviors in the internet, such as e-shopping and e-banking, (e.g. George, 2004; Tan and Teo, 2000; Hansen, et. al, 2004; Liao et. al., 1999, etc), and in analyzing gender differences in decision making processes (Morris et. al., 2005; Venkatesh, et. al. 2000) Lastly, "Ancestors" of the TPB theory such as the as the expectancy-value theory (EVT) has been used to study the FLOSS developers' motivations and continuance intentions (Wu et. al., 2007).

As Ajzen (1991) describes "Intentions to perform behaviors of different kinds can be predicted with high accuracy from attitudes toward the behavior, subjective norms, and perceived behavior control; and these intentions, together with percep-tions of behavioral control, account for considerable variance in actual behavior."

So, the TPB model sets three independent factors of intention of behavior (Ajzen, 1991). Attitude toward the behavior is defined as the individual's positive or negative feelings about performing a behavior. It is determined through an as-sessment of one's beliefs regarding the consequences arising from a behavior and an evaluation of the desirability of these consequences. Subjective norm is defined as an individual's perception of whether people important to the individual think the behavior should be performed. The contribution of the opinion of any given referent is weighted by the motivation that an individual has to comply with the wishes of that referent. Perceived behavioral control (PBC) is defined as one's perception of the difficulty of performing a behavior. In our case the behavior is the participation of firms in FLOSS communities. But this participation can be viewed into two different versions. The first version (Active Participation) is about the fully commitment of a company to a FLOSS project, in which case a firm will participate in the management of the project, in the development and the implementation of the software and in some case in the promotion of the project. The second version (Supporting / Funding participation) can be observed when companies do not contribute at

all in the development of the project and they only try to help by funding the project, supporting it through promotional activities or testing the software.

Firms' involvement in FLOSS is going to affect the construct "attitude" of the TPB as it also supported by the work of Osterloh (2003). However it also seems logic to affect the PBC construct, but until now there is no reference to justify this argument.

The different type of FLOSS products (different types of software) is a factor which affects the PBC construct of the TPB model because different resources are needed for different types of projects (Comino et. al., 2007). Also because different types of software do not have the same high profit potential (Krishnamurthy, 2005) the type of software is going to affect the "attitude" construct.

The developers' motivations (intrinsic or/and extrinsic) (Lerner and Tirole, 2002) are definitely going to affect the "subjective norm" of the TPB model, but if these developers work for a firm (and not only for an FLOSS project) then their motivations are also going to affect the "attitude".

Finally, the phenomenon of the tragedy of the commons as it was explained in the above chapter seems to affect the "attitude" and the PBC constructs of the TPB, since the firm has to contribute to a project, having in mind how to manage their relationship with the FLOSS community, in order not to face a Tragedy of the Commons (Schweik, 2005). It also affects the PBC construct, because a firm has to use the appropriate resources (Oh and Jeon, 2007) so as not to face a Tragedy of the Commons. Although it seems logical, it is not supported by the literature that the FLOSS commons are going to affect also the "subjective norm" of the TPB model.

The relationship between the different themes of the literature review analyzed above and the Ajzen's (1991) Theory of Planned behavior, which is the main theoretical tool used in this research, is presented in the table below. The correlation of the literature blocks and the TPB's constructs is justifiable by the literature, apart from

some cases that it seems logical to exist a relationship but cannot be justifiable by the recent literature.

	Attitude	Subjective Norm	Perceived Behavior Control
Firms' involvement in FLOSS	Yes	No	Needs Justification
FLOSS products	Yes	No	Yes
Developers' motivation	Needs Justification	Yes	No
Perceived importance of FLOSS	Yes	Needs Justification	Yes

Table 1 The relationship between the constructs of TPB model and the themes of the literature review of this research work

In the extended model of the TPB presented below, we have added all the factors taken from the literature review that can affect the three independent determinants of behavioral intention.
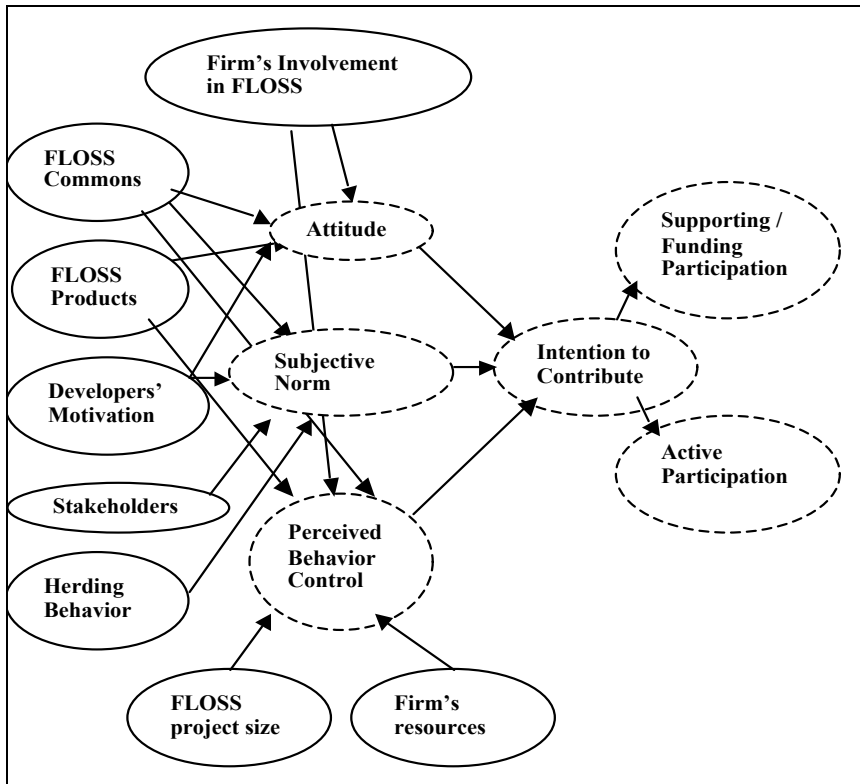
Figure 1 The research model based on the Theory of Planned Behaviour

In other words this model consists of the next hypotheses.

The first four hypotheses come from the direct application of the TPB in the context of the participation of the SME to FLOSS communities.

Hypothesis 1: The more favourable the attitude toward participation to FLOSS communities is, the greater the intention to participate to these communities will be. (ATTITUDE -> INTENTION)

Hypothesis 2: The greater the subjective norm to participation to FLOSS communities is, the greater the intention to participate to FLOSS communities will be. (SUBJECTIVE NORM -> INETNTION)

Hypothesis 3: The greater the perception of a firm of its ability to contribute to FLOSS communities is, the greater the intention to contribute to FLOSS communities. (CONTROL -> INTENTION)

Hypothesis 4: The greater the intention one firm has to participate to FLOSS communities, the more posible is to participate to FLOSS communities (INTENTION -> BEHAVIOR)

The involvement of a firm in the FLOSS movement either by using a business model based on FLOSS or by simply using applications based on FLOSS can influence their opinion about FLOSS in general, and more concretely about the participation to FLOSS communities. Also, the firm's perception of the FLOSS world and how much "open" a firm is, can affect positively the attitude of the firm toward the intention to contribute to FLOSS communities (Bonaccorsi et. al., 2006). This can also be supported by the work of Osterloh (2003). By participating to the FLOSS world and forming part of it, firms have a better and cleared idea how this world is working and under which valors is evolving. And this leads us to hypotheses 5 and 6.

Hypothesis 5: The greater the involvement of a firm in the FLOSS environment is, the more favourable the attitude toward participation to FLOSS communities will be. (FIRMS' INVOLVEMENT -> ATTITUDE)

Hypothesis 6: The greater the involvement of a firm in the FLOSS environment is, the greater the of the firms' perception of how easy or dificult is to participate to FLOSS communities (FIRMS' INVOLVEMENT -> PERCEIVED BEHAVIOR CONTROL)

FLOSS as a movement or as a business model has arrived lately and recently to a more mass adoption by the firms mainly in the IT sector. As it has differences from the usual and traditional model of producing software a lot of actors in this sector have a lot of doubts about the importance of this distributed way to produce software, and its future it's a little bit ambiguous since a lot of agents participate in this ecosystem (firms (big and SMEs), universities, Non profit foundations, individuals, governments, etc.), and we need to maintain an equilibrium to sustain this ecosystem (Oh and Jeon, 2007).

Hypothesis 7: The greater the perceived importance of FLOSS's future is, the more favourable the attitude toward participation to FLOSS communities will be. (PERCEIVED IMPORTANCE -> ATTITUDE)

Hypothesis 8: The greater the perceived importance of FLOSS's future is, the more favourable the subjective norm to participation to FLOSS communities will be. (PERCEIVED IMPORTANCE -> SUBJECTIVE NORM)

Hypothesis 9: The greater the perceived importance of FLOSS's future is, the greater perception of how easy or dificult is to participate to FLOSS communities (PERCEIVED IMPORTANCE -> PERCEIVED BEHAVIOR CONTROL)

Due to the fact that different types of FLOSS products exist (Infrastructural, Information Systems, Horizontal Applications, Vertical Applications, etc) that have have a different high profit potential, this can affect the attitude of the SMEs towards different kind of FLOSS projects. (Krishnamurthy, 2005). The different type of FLOSS products in terms of use and application is a factor which can also affect the easiness or not to contribute to them due to the fact that diferent kind of resources are needed for different types of projects (Comino et. al., 2007). According to these arguements we can formulate the next hypotheses of the research model.

Hypothesis 10: The greater the perceived importance of different FLOSS projects according to their use and destination, the more favourable the subjective norm to participation to FLOSS communities will be. (FLOSS PRODUCTS -> ATTITUDE)

Hypothesis 11: The greater the perceived importance of different FLOSS projects according to their use and destination the greater perception of how easy or dificult is to participate to FLOSS communities (FLOSS PRODUCTS -> ATTITUDE -> PERCEIVED BEHAVIOR CONTROL)

The developers' motivations (intrinsic or/and extrinsic) (Lerner and Tirole, 2002) and their participation to FLOSS communities during

their spare time can affect the subjective norm to participation to FLOSS communities. Also, as these developers form part of the firm can also affect the attitude toward participation to FLOSS communities. This reasoning can lead us to the hypotheses 12 and 13.

Hypothesis 12: The greater the motivations of the developers of the firm are, the more favourable the attitude toward participation to FLOSS communities will be.

Hypothesis 13: The greater the motivations of the developers of the firm are, the more favourable the subjective norm to FLOSS communities will be.

Yet, the stakeholders' opinion and and their perception of FLOSS are going to affect positively the perceived socially pressure to perform the action of contribution to FLOSS projects. In other words, the social pressure towards the intention to contribute to FLOSS communities is going to be affected positively, if lots of other competitive firms have decided to contribute to the FLOSS communities (Miralles et. al. 2006). This can lead us to hypotheses 14 and 15.

Hypothesis 14: The more favourable the opinion of the stakeholders toward participation to FLOSS communities is, the more favourable the subjective norm to participation to FLOSS communities will be. (STAKEHOLDERS -> SUBJECTIVE NORM)

Hypothesis 15:   The more favourable the opinion of big multinational firms toward participation to FLOSS communities is, the more favourable the subjective norm to participation to FLOSS communities will be. (HERDING BEHAVIOR -> SUBJECTIVE NORM)

Finally, the FLOSS project size in terms of developers can affect the easiness or not of contributing to it. A large FLOSS project with a high level of hierarchy can have a lot of transaction costs that SMEs are not willing to adopt. This is also related with the firm's resources, in terms of economic, knowledge and human capital.

This can be a limit and determined factor that affect positively the SMEs intention to participate to FLOSS communities. So, with this reasoning we can formulate the last hypotheses of the research model.

Hypothesis 16: The biggest the FLOSS project in terms of developers base is, the greater perception of how dificult is to participate to FLOSS communities . (FLOSS PROJECT SIZE -> PERCEIVED BEHAVIOR CONTROL)

Hypothesis 17: The biggest the firm in terms of human, knowledge and finance capital is, the greater perception of how easy or dificult is to participate to FLOSS communities. (FIRMS' RESOURCES -> PERCEIVED BEHAVIOR CONTROL)

3.2   Research Methodology

A qualitative analysis was used so as to define the factors that are going to affect the intention of the firms to contribute to FLOSS communities. The method of the qualitative analysis was based on semi-structured interviews with CEOs and CIOs of firms in Catalunya and Greece that have adopted FLOSS and contributed or wanted to contribute to FLOSS communities. The result of this qualitative analysis was the validation of the structural model presented above.

A qualitative analysis and more specifically case studies were used so as to gather insights on the intention of the firms to contribute to FLOSS communities. According to Yin (1984) this is the most appropriate research method for an exploratory approach. The collection of the primary data was based on semi-structured interviews because as described by Noor (2008) "it offers sufficient flexibility to approach different respondents differently while still covering the same areas of data collection". These interviews had duration of 1 hour with CEOs and CTOs of SMEs firms in Spain and Greece of the ICT sector that have adopted FLOSS and

contribute or want to contribute to FLOSS communities. The result of this qualitative analysis gave us a first deep insight about the opinion of firm's about their participation in FLOSS, and at a second level was used so as to validate a general structural model that tries to depict the incentives of firms' participation under a behavioral perspective.

We tried to conduct interviews in two different countries so as to generalize as much as possible the results of our study. One of these companies is a Mobile Service Provider, the second one is an e-Learning platform provider, the third one is a group of companies offering IT solutions for SMEs, the fourth one is an IT integrator and the last one is a VoIP provider. The selection of these companies has been according to their size (SMEs, with less than 150 employees) and their participation to FLOSS communities. The interviews were conducted during personal meetings with the CEOs or CTOs of these companies in Greek, English and Spanish (depending the preference of the interviewee) and transcribed. So, some of the quotations used in this analysis and reported in the paper are translations into English.

The interviews were conducted during 2008 and 2010 and were based on a number of predefined open questions. Specifically, there were two set of questions. One about why they use FLOSS and later on according to their answer a discussion followed with unpredefined questions. The second set consists of 4 sub-groups of questions related to the literature review mentioned earlier (i) Involvement of firms in FLOSS, ii) FLOSS products, iii) intrinsic and extrinsic motivation of developers and iv) Commons and FLOSS) and the opinion of the interviewees about the arguments expressed by researchers about FLOSS. This second set of questions tries to indentify why firms contribute to FLOSS. Interviewees more specifically were asked, (a) 'Is your business model based to FLOSS', (b) 'Does the type the FLOSS application (vertical or horizontal) and its target (niche group of users or an amplified base of users) affect your decision to participate to a FLOSS project? ', (c) 'Do your employers contribute or contributed

to FLOSS projects?' and (d) 'What is your opinion about the future of FLOSS? Do you think that FLOSS can face the tragedy of the commons?' A discussion according to their answers followed this set of questions.

In order to validate the above research model and support the derived hypotheses, a large-scale survey was used as a methodological tool. More specifically, the technique of Computer Aided Telephone Interview (CATI) was used so as to collect the necessary data and reach the designated population for this research work. Also, a pilot study was conducted so as to investigate the coherence of the items of the survey. After the pilot study, several changes were made. The survey started in April 2010 and lasted until May 2010.

The instrument's items derived from other relevant studies using the Theory of Planed Behavior, and every item has been adjusted to fit the context of FLOSS. The items were translated into Catalan and Spanish so as to be compatible with the bilingual nature of Catalonia. A total of 32 items using 7-likert scale and 5 binaries item were created. Also two items were the index of some questions like in the case of the constructs about intention and actual participation. This method was selected in order to have a clearer idea about the depth of their intention and actual participation in the FLOSS communities. This decision was a result from the pilot study and the comments we got from the participants in it. Finally, the average duration of the telephone survey was 15 minutes.

The target group of this research work was Catalan SMEs, which have less than 150 employees, of the IT industry, as defined by OECD. The sample was obtained from the Sistema de Análisis de Balances Ibéricos (SABI) database, which is provided by the Bureau Van Dijk and contains all the public information of all the registered firms in Iberian Peninsula. This categorization resulted in a target group of 5200 firms. The final sample of this research work consists of 303 firms and it is consistent with the quotes of the firms

of the target group according to sector (Manufacturing, Commerce and IT services) and number of employees.

4   QUALITATIVE ANALYSIS

4.1   1st Case Study (MobileMedia LTD)

MobileMedia is a company based in Athens (Greece) offering mobile services, and mainly infrastructure that can support mobile marketing campaigns. It has less than 10 employees and less than 10 years of life. It also offers services outside Greece, working in the Balkan region and South America. This interview was conducted with the CEO and founder of the firm. The main contribution of this firm to the FLOSS communities is the monetary donation to FLOSS projects like postgress SQL and Linux.

In the first set of questions he responded that the main reason of adoption of FLOSS was "cultural" in the sense that he is a Computer Science graduate with a lot of experience with the FLOSS world. As he mentions "Actually in our firm it was a heritage, 'cause I started the firm alone as a developer, and in university we were taught to use OSS like java and C. We actually studied on Linux environments, so as a heritage we started with OSS. And we continued with OSS." But also cost and the quality of FLOSS are other reasons of the adoption of FLOSS by his company. In more details he states "If it was let's say a decision that I should make right now, I will choose OSS again due to cost…Well, right now it is proved that OSS is a stable software, so there are components that work fine, so I don't know why a firm like ours, which a purely technologically firm, we should go to a paid solutions and not handle our request by using OSS…Since its proven and it works, why not use it!"

In the next set questions, the main points that were mentioned during this interview were that the resources of the firm along with the importance of the FLOSS in the business model are important

factors whether a company will contribute or not in a FLOSS project. In more detail he mentions "To be honest, if there was a project that is crucial for our firm, I would surely devote some percentage of my man-hours. But, since we are just using components to develop our infrastructure, is not such crucial for my firm to devote man-hours to contribute to an OSS. So if there was, a project that we are using it as a platform to deliver our services, I would definitely devote some resources in order to steer the whole process in a way that would have a positive effect in our business." Also, he is skeptical about whether the Tragedy of the commons can exist in the case of FLOSS, and he is mainly in favor of the Raymond's opinion. According to him "…this risk also exists in products that are produced by small firms. You don't know the next day if this company would continue to deliver the software…No, I wouldn't say that (This risk is greater in the case of OSS?). At the end of the day if something goes wrong and the developers leave the project, you have the source code, so you can continue working by developing it in-house, if it so crucial for the operations of the company."

4.2 2nd Case Study (Cometatech)

This is a company based in Barcelona (Spain) with less than 50 employees. The main objective of this company is the integration of FLOSS projects and provision of custom IT solutions to its clients. The interview was conducted with the CTO and co-founder of the company. This firm contributes in two ways. Firstly by buying projects and products from FLOSS communities supported directly by another firm and by developing patches or fixes and extensions to FLOSS projects supported by a loosely community.

In the first set of questions he answered that cultural reasons and a business decision was the main factors that lead this firm to use FLOSS. As he declared "…When we started the company, I am one

of the founders, as a spin-off from a university and we spilled off from the computer science department there, and FLOSS was the only thing we knew about. … And the other reason is a business model reason. Every year it's easier and easier to sell the business model around OSS to our clients. They really understand it very well, it was not as well as 5 years ago, but now really our clients are trying to contract us just because we work with OSS."

In the second set of questions the main comments worth mentioning are about the FLOSS commons. "What happens is that when a company is affecting the project in the sense of participation and contribution to the OSS project, the developers continue to work if the company is committed to the goals of the initial stages of the project, or they leave when there is no alignment between the community and the company. ... This "commons" thing where people share something and someone tries to get more profit from the other is clearly a difficult situation to handle. This fork of the previous examples will make people consider being more careful how to behave to communities, define in a better way their business model and align their strategy with the goals of the community. … When we want to integrate different OSS we check the maturity of the project and the company and/or the community that supports it. It is a long process. We put the hat of the developer and start to evaluate the project, how is easy to download the s/w, what is the interaction of the developers in the forum and the mailing list of the project, checking the cvs system of the project." Also another important topic derived from this interview is the fact that is difficult to reach and contribute to large, in number of developers, FLOSS projects. As he mentions "I suppose if you go to the biggest projects, they are very structured and organized because they support thousands of users, so is very difficult to reach these organizations."

4.3 3rd Case Study (Vtrip)

This is a company based in Heraklion and Athens (Greece). It is a software development company offering software packages to SMEs and founded in September 2000 and currently employs a little bit less than 100 employees. This interview was conducted with the CEO and founder of the firm. The main contribution of this firm to the FLOSS communities is the active participation in different FLOSS projects and the liberation of in-house software projects to the FLOSS world under FLOSS licenses. The interview conducted with the CEO and founder of the company.

As it concerns to the first set of questions about the usage of FLOSS products, this company uses FLOSS in order to have presence in global markets and started using FLOSS as it is a spinoff from university. Another interesting comment made during this conversation was that the main barrier for companies to use FLOSS is the absence of support in some FLOSS products. As he mentions, "We have not installed FLOSS ERP or FLOSS CRM, because we need someone with expertise to make the personalization and customization. Something that is very difficult to find in the market."

About the second set of questions, one of the most interesting comments was that his company contributes to FLOSS communities in order to have a presence in global markets. "When we started, we contributed in many FLOSS projects in order to promote the work of our company. Being at that time a very small company we had no budget to devote to marketing, so we tried to do it through participating to FLOSS projects and by trying to make known our work in these communities. We also, gained a lot of expertise by participating to these FLOSS projects". It is also was mentioned that there is a need to search and establish a compatibility in the culture and the interests between the two biggest poles in the evolution of FLOSS (firms and individuals), so as in order to have a bright future of FLOSS.

4.4 4th Case Study (Epignosis LTD)

This is a company based in Athens (Greece) and founded in November 2003. It is the vendor of an open source e-Learning platform, which envisages e-Learning 2.0 as the dominant approach for human capital development, education & training services. It has 5 employees and 5 years of life. Its main contribution to the FLOSS world is its product, which was developed in-house but offered under a FLOSS license. The interview was conducted with the CTO and co-founder of the company.

Regarding the first set of questions, this company uses FLOSS as it is a pure software development company and in order to be competitive needs to use the cheapest solutions available. Apart from that, as it was mentioned, the founders of this company come from a computer science department and they had a lot of experience in developing by using FLOSS technologies before creating this firm. According to the interviewer "University is the best and biggest promoter of FLOSS."

Now, concerning the second set of questions, one comment made that worth mentioning is that the type of the FLOSS (generic or specific) can play a role in the decision of a firm to contribuye to the FLOSS World. As he clearly states "The type of the FLOSS product can play a role on whether a company will liberate an in-house FLOSS project. This internal project if it gives a competitive advantage to the firm, will be very difficult to liberate it and give it to the community. If not, it will give it, in order to gain expertise and market share."

4.5 5th Case Study (Voz Telecom)

This is a company based in Barcelona (Spain) with less than 50 employees. The main objective of this company is to offer VoIP applications and solutions to small and big companies, around the world. It was founded in 2003 and its contribution to FLOSS communities is the provision of add-ons and patches to existing FLOSS projects. Also, in the near future the company intends to liberate to the FLOSS community one the in-house internal projects. Apart from that, a lot of the personnel participate in the boards of FLOSS projects like open share. The interview was conducted with the CTO of the company.

As far as it concerns the first set of questions, this company uses FLOSS because it fits to its needs and is more flexible. "Generally, FLOSS is much more flexible than proprietary software…We are looking for the software that adapts better to our needs. If this is proprietary, then we choose proprietary. If this is FLOSS, we choose FLOSS."

During the second set of questions the intervieew commented that until now they have not liberated a set of applications they have created because it gives them a certain competitve advantage, and because also the investors were against it. But as this company maintains a certain FLOSS "culture" they will, in the future, provide under BSD or GLPv3 license this set of applications. Also, according to the interviewer's experience and knowledge, some of the companies enter in a FLOSS community in order to change its evolution by participating directly in the management of the project. As he states "I remember years ago, in a small FLOSS project, appeared from nowhere a person, and he started creating "noise" by participating in the forum and submiting source code. In a couple of months, this person successful managed to be in charge of this project, and he was representing a company." A worth mentioning comment of this interviewer is that sometimes it is difficult for big firms to participate in FLOSS projects due to the bad perception of

individuals about companies and their role in th FLOSS communities. "…Depends on the project. For example in the Apache project they are very jealous and they want to keep their independence. So in this case it is very dificult and complicated for example for NOKIA to participate, but not so difiicult for a SME. But in otherwise it is easier for a big company to participate in a small project." Finally, about the Tragedy of the Commons this interviewer mentions that we can observe this phenomenon, and he explicitlly states "When you need people very specialized in an area and they leave, they abandon the project then you can encounter the tragedy. Even though there are a lot of developers, don't exist very specialized ones. For example in the development of Operating Systems there are no so many developers specialized in filesystems, which is so important on the development and the evolution of Operating Systems."

4.6   Case studies analysis

As far it concerns the first research question about the participation of the firms in FLOSS communities, it seems that university plays an important role in the adoption of the FLOSS. 4 out of 5 companies are spin off from universities and founded from computer science students. As they mentioned in the interviews, the usage of FLOSS came like a heritage from the university and their relationship with it during studies in university. Two of them clearly state this argument. It also has been mentioned, that the choice of FLOSS was because of its fit with the needs of the company, and if there was any better proprietary solution, they wouldn't have any problem in using it. According to the knowledge of the authors this is something new, which has not been mentioned in previous works about the participation of companies in FLOSS communities.

Also can be conclude that for SMEs is very difficult to contribute to FLOSS communities since they don't have the necessary human

resources. This is compatible with the current literature review, as this is mentioned to previous work such as the work of Bonaccorsi et al (2006). They would only contribute if FLOSS was crucial for their businesses, or part of their business model, even though they have an interest in forming part of a FLOSS community. Also, if the business model introduced around FLOSS is not aligned with the FLOSS community, this could lead to the loss of a critical mass of individual developers. In addition to, appreciation of firms (and especially CEOs) towards FLOSS quality, can act as a facilitator to pushing firms to use and contribute to FLOSS communities. This is related to previous work conducted to this subject like the one from Bonaccorsi et. al. (2006).

Finally concerning the second research question, the firms interviewed are recognizing the possibility of the existence of the tragedy of the commons in FLOSS communities considering that is difficult to sustain a FLOSS and seemed to be skeptical on how they can balance a good relationship with the rest members of the community, along with a competitive advantage gained by the participation to this community.

In the next table we summarize how each of the case studies helps justify better the hypotheses formulated in the Chapter 3.

1st Case Study	1. The use of FLOSS was a heritage from Univerity
	2. Firms Resources are important to contribute to FLOSS Communities
	3. Attitude towards participation to FLOSS communities is important
	4. Perceived Importance of FLOSS is not an important factor to contribute to FLOSS communities
2nd Case Study	1. The use of FLOSS was a heritage from Univerity
	2. Perceived Importance of the FLOSS future is

		important to the participation of FLOSS communities.
	3.	The FLOSS project size does affect the intention to participate to FLOSS projects
3rd Case study	1.	Use of FLOSS in order to have presence to global markets and because was a heritage from university
	2.	Perceived Importance of the FLOSS future is crucial to the participation of firms to FLOSS communities
4th Case study	1.	Use of FLOSS in order to reduce costs
	2.	The type of FLOSS product plays a crucial role whether a firm will share it with the FLOSS community or not
5th Case study	1.	Use of FLOSS due to its flexibility
	2.	The type of FLOSS product plays a crucial role whether a firm will share it with the FLOSS community or not
	3.	Perceived Importance of the FLOSS future can play a crucial role in the participation of firms to FLOSS communities

5   QUANTITATIVE ANALYSIS

For the analysis of the gathered data we followed the methodology of Partial Least Squares (PLS) path modelling. This structural equation modelling technique was chosen for its ability to handle non-normality in the data and measures that are not well established, and because the goal of this study is to explain variance in the outcome variable (Gefen et. al. 2000). In more detail, PLS path modelling is particularly useful toward overcoming any estimation problems by the complex research model. Data were analyzed with the help of SmartPLS 2.0 (Ringle, Wende, & Will, 2005). PLS was also appropriated for the present study since it can handle both reflective and formative scales, both of which are included in the model. Specifically, the Intention to Contribute and Participation constructs were modeled as formative due to their nature of being indices of several items.

5.1 Descriptive Results

The sample as mentioned before consists of 303 companies. 5,3% of them belongs to the manufacturing sector, 19,3% in the commerce sector and 75,3% in the IT services sector. The majority of these companies (46,7%) have 1 or 2 employees, 31% have until 9 employees, and 22,3% from 10 to 150 employees. 70,1% of these companies are very familiar with FLOSS since they use it daily. The most famous FLOSS applications seem to be communication tools (browser y mail client), since 69,5% of the companies that use FLOSS, use this kind of FLOSS applications. 44,7% of these firms use document management tools and 40,4% operating systems based in LINUX. The most famous FLOSS application seems to be Firefox, which is used by 64% of the firms of our sample, the next one is Open Office, which is used by 44,7%. Also these firms use a lot Apache server, since 24,9% of these companies use it. One interesting point of this survey is that 84,4% of the companies that do not use FLOSS, do not have the intention use it in the future. The participation of the firms that use FLOSS in the FLOSS

communities is mainly beta testing, since 37,9% of them participate in the beta testing procedure and also in the development of FLOSS applications as 30,5% of them is doing it. Another interesting point is that the vast majority of these companies develop FLOSS with the final purpose to use it internally. 50,6% of the companies that develop FLOSS commercializes it, and almost half of the companies that develop FLOSS (44,4%) share it with the FLOSS community. Finally, 57% of the companies that participated in this study have a yearly income of less than 500 thousands of Euros.

5.2   TPB Model

Firstly, we tried to see how the simple and basic model of the Theory of Planned Behavior, is validated or not by the dataset we obtained from the telephone interviews we conducted. The model that was investigated is represented in Figure 2.
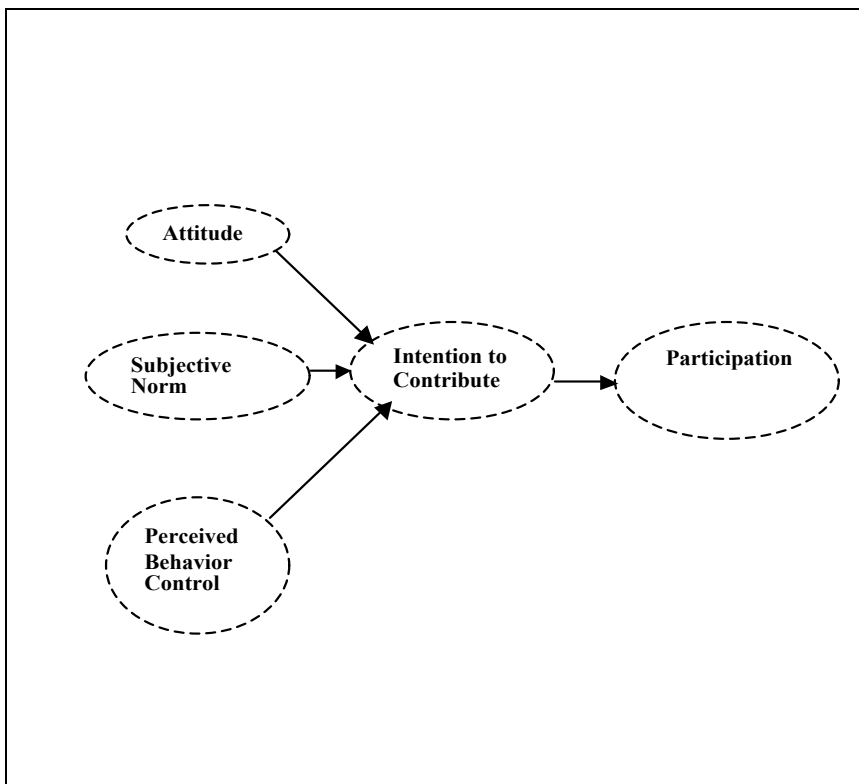
Figure 2 The Theory of Planned Behavior model

We firstly intended to observe the quality of the data of these data. We achieved by checking the reliability, the convergent validity, and the discriminant validity of the data.

5.2.1 Reliability

Reliability was assessed via Cronbach's α for each multi-item variable. Not all Cronabach's α exceed Straub's (1989) rule of thumb of 0.8, since the Cronbach's α of PBC is 0.26 (Table 2).

5.2.2 Convergent validity

Convergent validity is an assessment of the agreement among measures of the same construct (Bagozzi et. al. 1991). So, high levels of convergent validity indicate that the items reflect the same latent variable. Two tests were used to assess convergent validity. Items with loadings greater than 0.70 indicate acceptable convergent validity (Comrey, 1973). All our items had loadings in excess of 0.70 (Table 4) demonstrating the instrument's convergent validity. Convergent validity was also assessed by observing the square root of the average variance extracted (AVE). A minimum level of 0.50 is suggested (Fornell and Larcker, 1981; Gefen and Straub, 2005) since it indicates that, on average, the construct accounts for at least 50% of its measures variance. All our scales (Table 2) met this criterion, indicating satisfactory convergent validity.

5.2.3 Discriminant validity

Discriminant validity indicates that the items measure only the construct for which they were created and not other construct in the model (Salisbury et. al. 2002). AVE was proposed by Fornell & Larker (Fornell & Larcker, 1981) as an adequate measure for assessing the amount of variance captured by a latent variable in relation to that due to the measurement error. The literature suggests that convergent validity can be considered as acceptable if AVE exceeds 0.50 (Hair, et al., 2006), which is the case for all our constructs.

5.2.4 Construct validity

Composite reliability (CR) scores (Table 2) are used as an indication of the scale's reliability. Not, all scales met the 0.70 cut-off suggested by Hair et. al. (2006), but the composite reliability of PBC is near this scale (0.66) indicating that results based on these scales should be consistent.

Constructs	AVE (>0.50)	CR (>0.70)	CA (>0.60)
Attitude	1.0000	1.0000	1.0000
Intention to Contriubute	0.0000	0.0000	0.0000
Perceived Behavior Control	0.5428	0.6632	0.2636
Participation	0.0000	0.0000	0.0000
Subjective Norm	0.7434	0.8965	0.8272

Table 2 Reliabilies and Convergent validity of the TPB Model (AVE: Average Variance Extracted, CR: Composite Reliability, CA: Cronbach's Alpha)

Constructs	ATT	SN	PBC
ATT	**1.0000**		
SN	0.1382	**0.8460**	
PBC	0.2057	0.4470	**0.7681**

Table 3 Disciminant validity of the TPB Model (The diagonal elements are the square root of AVE. ATT: Attitude, SN: Subjective Norm, PBC: Perceived Behavioral Control)

Constructs	ATT	INT	PA	PBC	SN
ATT1	1.0000	0.2348	0.4212	0.2724	0.1982
IC3	0.2348	1.0000	0.3154	0.4175	0.2758
PA3	0.2724	0.4175	1.0000	0.2888	0.3080
PBC1	0.4050	0.3171	0.9753	0.3913	0.3728
PBC2	0.1785	0.0754	0.3666	0.0745	-0.0165
SN1	0.2287	0.1912	0.3637	0.2570	0.7965

SN2	0.1714	0.2776	0.3024	0.2852	0.9269
SN3	0.1269	0.2338	0.2500	0.2551	0.8583

Table 4 Item Cross Loadings of the TPB model

Based on these tests, we can conclude that the scales are valid and reliable, providing confidence to proceed to hypothesis testing and to assess the overall model fit by examining the structural model. There is a problem with the Cronbach's α of Perceived Behavioral Control, but since it superpass the other criteria of validity, it was decided to maintain it to the structural model.

5.2.5 Structural Model

Table 5 represents the structural model's statistical characteristics. The R^2 values of the endogenous variables are rather modest in most instances, but the purpose of this analysis was to explore the possibility to verify the TPB model in the case of SME's participation to FLOSS communities. As it is shown, all the hypotheses of the original model of the TPB are supported, and more especially they are supported at a 0.001 level. Intention to Contribute is influenced positively by Attitude, Subjective Norm and Perceived Behavior Control (β=0.1125, β=0.1824 and β=0.2047 respectively). On the other hand Intention to Contribute affects positevely the Participation to FLOSS communities with a β=0.4175.

Hypothesis	Standardized Path Coefficient (β)	t Value	p Value	Hypothesis Testing
ATT -> IC	0.1125	2.1680	0.0000	Supported*
SN -> IC	0.1824	3.1419	0.0000	Supported*
PBC -> IC	0.2047	3.1937	0.0000	Supported*
IC -> PA	0.4175	8.7211	0.0000	Supported*

Table 5 PBC Structural Model (* at 0,001 level)

5.3 Simple Model

As a next step we tried to observe whats the direct influence of some of the introduced constructs and factors to the participation of

the SMEs to FLOSS communities, so as to have a clearer idea about the validity of these constructs before applying the extended TPB model. This model is presented below to Figure 3.
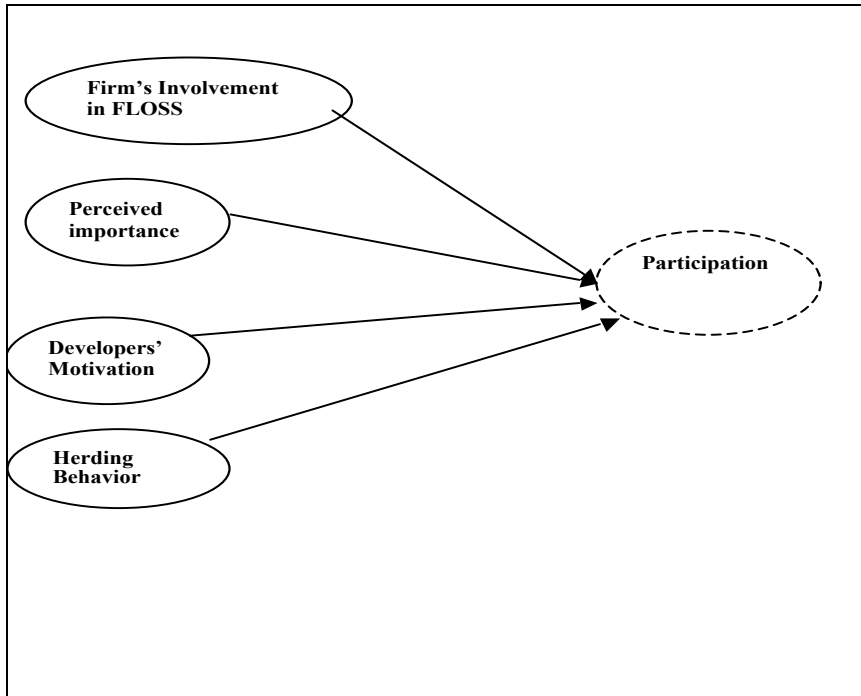
Figure 3 The simple model

5.3.1   Measurement Model

To assess the scales' psychometric properties, several tests were conducted like in the case of the TPB model.

5.3.2   Reliability

Reliability was assessed via Cronbach's α for each multi-item variable. Not all Cronabach's α exceed Straub's (1989) rule of thumb of 0.8, because Firm's Involvement in FLOSS has a Cronbach's α of 0.25 (Table 6).

5.3.3   Convergent validity

Convergent validity is an assessment of the agreement among measures of the same construct (Bagozzi et. al. 1991). So, high

levels of convergent validity indicate that the items reflect the same latent variable. Two tests were used to assess convergent validity. Items with loadings greater than 0.70 indicate acceptable convergent validity (Comrey, 1973). All our items had loadings in excess of 0.70 (Table 8) demonstrating the instrument's convergent validity. Convergent validity was also assessed by observing the square root of the average variance extracted (AVE). A minimum level of 0.70 is suggested (Fornell and Larcker, 1981; Gefen and Straub, 2005) since it indicates that, on average, the construct accounts for at least 50% of its measures variance. All our scales (Table 6) met this criterion, indicating satisfactory convergent validity.

5.3.4 Discriminant validity

Discriminant validity indicates that the items measure only the construct for which they were created and not other construct in the model (Salisbury et. al. 2002). AVE was proposed by Fornell & Larker (Fornell & Larcker, 1981) as an adequate measure for assessing the amount of variance captured by a latent variable in relation to that due to the measurement error. The literature suggests that convergent validity can be considered as acceptable if AVE exceeds 0.50 (Hair, et al., 2006), which is the case for all our constructs (Table 6).

5.3.5 Construct validity

Composite reliability (CR) scores (Table 6) are used as an indication of the scale's reliability. All scales almost met the 0.70 cut-off suggested by Hair et. al. (2006), indicating that results based on these scales should be consistent.

Constructs	AVE (>0.50)	CR (>0.70)	CA (>0.60)
Developers' Motivations	0.7158	0.8339	0.6102
Firms' Involvement in FLOSS	0.5503	0.6840	0.2502

Herding behavior	08864	0.9398	0.8721
Participation	1.0000	1.0000	1.0000
Perceeived Importance of FLOSS	0.4557	0.8324	0.7809

Table 6 Reliabilies and Convergent validity of the simple model

Constructs	DM	FI	HB	PA	PI
DM	**0.8460**				
FI	0.4200	**0.7418**			
HB	0.3546	0.1663	**0.9414**		
PA	0.4369	0.6450	0.1795	**1.000**	
PI	0.4955	0.2849	0.2554	0.5104	**0.6750**

Table 7 Discriminant Validity of simple model (The diagonal elements are the square root of AVE. DM: Developers Motivation, PI: Perceived Importance, FI: Firms' Involvement in FLOSS, HB: Herding Behavior, PA: Participation)

Constructs	DM	FI	HB	PA	PI
DM1	**0.8935**	0.3664	0.3369	0.4182	0.4703
DM2	**0.7958**	0.3463	0.2551	0.3101	0.3572
FI1	0.2541	**0.4454**	0.1424	0.2220	0.2351
FI2	0.3452	0.2600	0.1224	0.3321	0.2563
FI3	0.3265	0.2108	0.1235	0.3327	0.2467
FI4	0.3352	0.1889	0.0916	0.3464	0.2260
FI5	0.3755	**0.9498**	0.1340	0.3355	0.2327
HB1	0.2938	0.1340	**0.9361**	0.1611	0.2141
HB2	0.3706	0.1772	**0.9468**	0.1762	0.2647
PA3	0.4369	0.3450	0.1795	**1.0000**	0.2104
PI1	0.3378	0.1367	0.2470	0.3130	**0.6557**
PI2	0.3521	0.1338	0.2941	0.2876	**0.6715**
PI3	0.3463	0.1510	0.3309	0.2923	**0.6607**

Table 8 Item Cross Loadings of the simple model

Based on these tests, we can conclude that in order to proceed with the hypotheses testing we had to keep out of the analysis the items FI2, FI3 and FI4 because they don't load at a satisfactory level at the construct of Firms' Involvement in FLOSS. Also, we included in the structural model the construct of Perceived Importance eventhough its Cronbach's α it is not so high but, as we can see it meets all the other criteria.

5.3.6   Structural Model

Table 9 represents the structural model's statistical characteristics of the simple model. The R^2 value of the construct of Participation (0.723) can lead us to the conclusion that the new constructs introduced can explain satisfactorally the participation of SMEs to FLOSS communities. As it is shown, not all the hypotheses of the modified model are supported at either 0.05 or 0.001 level, apart from the hypothesis that the Firms' Involvement and Perceived Importance of FLOSS tha influence positevely the participation of SMEs to FLOSS communities at a 0.001 level (β=0.5046 and β=0.6074 respectively).

Hypothesis	Standardized Path Coefficient (β)	t Value	p Value	Hypothesis Testing
DM -> PA	-0.0627	1.4330	0.1520	Not Supported
FI -> PA	0.5046	16.6407	0.0000	Supported*
HB -> PA	-0.0373	1.1713	0.2416	Not Supported
PI -> PA	0.6072	17.8802	0.0000	Supported**

Table 9 Model Summary of simple model (* p<0.001 2 tailed)

This intermediate step can ilustrate us in a clearer way the importance of the new introduced factors and their influence to the participation of the SMEs to FLOSS communities.

5.4   Extended Model

The next step is to test the extended research model that is the basis of this research. In this extended version of the TPB model we had

to make some changes concerning the initial research model proposed to the Chapter 3. These changes are due to the fact that some of the constructs introduced to the TPB model had to be discard because didn't pass the validity tests. The final research model is respresented in the Figure 4.
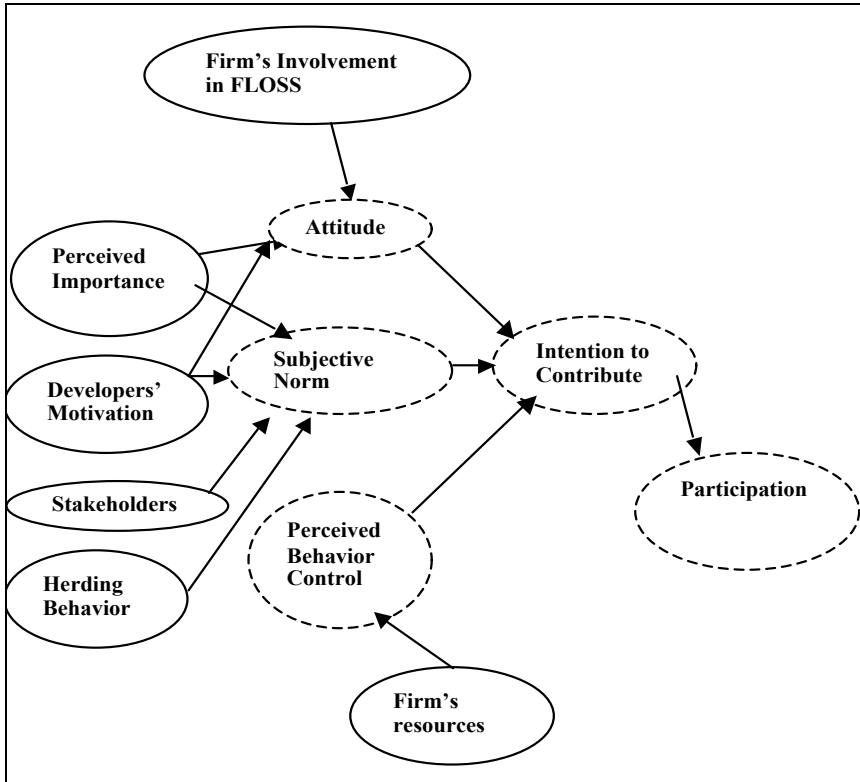
Figure 4 Final Extended TPB Model

5.4.1   Measurement Model

As in the previous steps in order to assess the scales' psychometric properties, several tests were conducted. We describe those tests next, beginning with the reflective scales and then discussing the formative ones.

5.4.2   Reliability

Reliability was assessed via Cronbach's α for each multi-item variable. Not all Cronabach's α exceed Straub's (1989) rule of

thumb of 0.8, but they all exceed Nunnally's (1978) threshold of 0.6 (Table 10).

5.4.3 Convergent validity

Convergent validity is an assessment of the agreement among measures of the same construct (Bagozzi et. al. 1991). So, high levels of convergent validity indicate that the items reflect the same latent variable. Two tests were used to assess convergent validity. Items with loadings greater than 0.70 indicate acceptable convergent validity (Comrey, 1973). All our items had loadings in excess of 0.70 (Table 4) demonstrating the instrument's convergent validity. Convergent validity was also assessed by observing the square root of the average variance extracted (AVE). A minimum level of 0.70 is suggested (Fornell and Larcker, 1981; Gefen and Straub, 2005) since it indicates that, on average, the construct accounts for at least 50% of its measures variance. All our scales (Table 11) met this criterion, indicating satisfactory convergent validity.

5.4.4 Discriminant validity

Discriminant validity indicates that the items measure only the construct for which they were created and not other construct in the model (Salisbury et. al. 2002). AVE was proposed by Fornell & Larker (Fornell & Larcker, 1981) as an adequate measure for assessing the amount of variance captured by a latent variable in relation to that due to the measurement error. The literature suggests that convergent validity can be considered as acceptable if AVE exceeds 0.50 (Hair, et al., 2006), which is the case for all our constructs.

5.4.5 Construct validity

Composite reliability (CR) scores (Table 1) are used as an indication of the scale's reliability. All scales met the 0.70 cut-off suggested by Hair et. al. (2006), indicating that results based on these scales should be consistent (Table 10).

5.4.6   Formative scale

Since individual items in formative scales need not correlate, it is inappropriate to subject them to the same reliability tests as the reflective ones (Petter et. al., 2007). Instead, an indication of item-to-scale importance may be assessed by observing the items' weights (Chin, 1998). We followed the process proposed by Diamantopoulos and Winklhofer (2001) and removed non-significant items. This process was followed for the constructs of Intention to Contribute and Participation, since these constructs were measured on formative scale.

Constructs	AVE (>0.50)	CR (>0.70)	CA (>0.60)
Attitude	1.0000	1.0000	1.0000
Developers Motivation	0.7157	0.8338	0.6102
Perceived Importance	0.5900	0.8114	0.6737
Firm's Resources	0.7129	0.8806	0.8295
Firms' Involvement in FLOSS	0.5791	0.8043	0.6378
Herding Behavior	0.8858	0.9394	0.8721
Stakeholders	0.8899	0.9697	0.9564
Subjective Norm	0.6590	0.9204	0.8955
Perceived Behavior Control	0.5428	0.6632	0.2636

Table 10 Reliabilies and Convergent validity of the extended TPB model

Constructs	ATT	DM	PI	FR	FI	HB	IC	PA	STK	SN
ATT	**1.0000**									
DM	0.3136	**0.8460**								
PI	0.2520	0.4470	**0.7681**							
FR	0.1152	0.0959	0.1314	**0.8443**						
FI	0.3066	0.4395	0.2548	0.0367	**0.7610**					
HB	0.2010	0.3564	0.3231	0.1832	0.1471	**0.9412**				
IC	0.2348	0.4552	0.3389	0.0161	0.4016	0.2713	**1.0000**			
PA	0.2724	0.4370	0.2618	0.0211	0.7410	0.1798	0.4175	**1.0000**		

STK	0.1382	0.2246	0.2541	0.0381	0.1566	0.3574	0.1572	0.1377	**0.9433**	
SN	0.2057	0.3989	0.3817	0.1986	0.3683	0.3632	0.2731	0.3470	0.3056	**0,8118**

Table 11 Disciminant validity of the extended TPB model

Constructs	ATT	DM	PI	FR	FI	HB	IC	PA	STK	SN
ATT1	**1.0000**	0.3136	0.2532	0.1152	0.3066	0.2010	0.2348	0.2724	0.1382	0.2059
DM1	0.3241	**0.8943**	0.3395	0.0744	0.4296	0.3384	0.3854	0.4182	0.1948	0.3642
DM2	0.1901	**0.7947**	0.4759	0.0917	0.2997	0.2566	0.3912	0.3101	0.1867	0.3069
PI1	0.2908	0.4223	**0.7873**	0.1319	0.2414	0.2485	0.3162	0.2661	0.2248	0.3575
PI3	0.1184	0.2726	**0.7467**	0.0577	0.1636	0.2584	0.2158	0.1307	0.1902	0.2505
PI4	0.1130	0.2980	**0.7233**	0.0972	0.1600	0.2502	0.2232	0.1717	0.1591	0.2414
FI2	0.1878	0.3452	0.1975	0.0436	**0.7291**	0.1226	0.3902	0.3321	0.0996	0.3344
FI3	0.2504	0.3268	0.1951	0.0406	**0.8295**	0.1241	0.3273	0.3327	0.1200	0.2879
FI4	0.2512	0.3353	0.1907	0.0036	**0.7195**	0.0923	0.2219	0.4464	0.1334	0.2333
FR1	0.0945	0.1039	0.1238	**0.9212**	0.0431	0.1363	0.0181	0.0391	0.0109	0.1568
FR2	0.1067	0.0687	0.1056	**0.8787**	0.0245	0.1943	0.0118	0.0025	0.0559	0.2025
FR3	0.1178	0.0457	0.1103	**0.7199**	0.0077	0.1776	0.0042	0.0246	0.0688	0.1774
HB1	0.1475	0.2939	0.2497	0.1632	0.1216	**0.9301**	0.2219	0.1611	0.3219	0.3083
HB2	0.2243	0.3706	0.3500	0.1803	0.1528	**0.9521**	0.2836	0.1762	0.3490	0.3703
IC3	0.2348	0.4552	0.3389	0.0161	0.4016	0.2713	**1.0000**	0.4175	0.1572	0.2731
PA3	0.2724	0.4370	0.2618	0.0211	0.4410	0.1798	0.4175	**1.0000**	0.1377	0.3470
SN1	0.2287	0.3253	0.3179	0.0736	0.2852	0.2925	0.1912	0.2570	0.3356	**0.7291**
SN2	0.1714	0.2891	0.3153	0.1396	0.3478	0.3012	0.2776	0.2852	0.2803	**0.8138**
SN3	0.1269	0.2907	0.2684	0.1541	0.2651	0.2912	0.2338	0.2551	0.2317	**0.7835**
SN4	0.1848	0.3379	0.3023	0.1547	0.3007	0.2486	0.1731	0.3130	0.1845	**0.8009**
SN5	0.1463	0.3521	0.3236	0.2188	0.3008	0.2960	0.2344	0.2876	0.2158	**0.8682**
SN6	0.1427	0.3462	0.3257	0.2241	0.2893	0.3314	0.2123	0.2923	0.2299	**0.8668**
STK1	0.1255	0.2183	0.2397	0.0395	0.1415	0.3368	0.1424	0.1183	**0.9887**	0.3062
STK2	0.1544	0.1930	0.2482	0.0227	0.1781	0.3502	0.1776	0.1816	**0.7918**	0.2256
STK3	0.1255	0.2183	0.2397	0.0395	0.1415	0.3368	0.1424	0.1183	**0.9887**	0.3062
STK4	0.1255	0.2183	0.2397	0.0395	0.1415	0.3368	0.1424	0.1183	**0.9887**	0.3062

Table 12 Item Cross Loadings of the extended TPB model

Based on these tests, we can conclude that the scales are valid and reliable, providing confidence to proceed to hypothesis testing and to assess the overall model fit by examining the structural model. Eventhough PBC's Cronbach's α is low Perceived Behavior Control was included in the structural model because it meets all the other criteria tests.

5.4.7 Structural Model

Table 11 represents the structural model's of the extended TPB model statistical characteristics. The R^2 values of the endogenous variables are rather modest in most instances, but the purpose of this study was not to identify the most important predictors, but rather to investigate the relationship between the latent variables. As it is shown, all the hypotheses of the extended TPB model are supported at either 0.05 or 0.001 level. Intention to Contribute is influenced positively by Attitude, Subjective Norm and Perceived Behavior Control ($\beta=0.124$, $\beta=0.176$ anb $\beta=0.195$ respectively). The Developers' Motivation has a positive effect at the Attitude and the Subjective Norm of the firm ($\beta=0.141$ and $\beta=0.225$ respectively). Also, Perceived Importance influences positively the Attitude and the Subjective Norm of the firm ($\beta=0.115$ and $\beta=0.164$ respectively). The Attitude is also influenced positively from the Firm's Involvement in FLOSS ($\beta=0.257$). Morever, the Subjective Norm is positively influenced by the constructs of Herding Behavior and Stakeholders ($\beta=0.174$ and $\beta=0.155$ respectively). Finally Firm's Recources affect positevely Perceived Behavior Control with $\beta=0.140$.

Hypothesis	Standardized Path Coefficient (β)	t Value	p Value	Hypothesis Testing
ATT -> INT	0.1244	2.3297	0.0199	Supported**
DM -> ATT	0.1697	2.3472	0.0190	Supported**
DM -> SN	0.2255	3.8775	0.0001	Supported*
PI -> ATT	0.1251	2.0833	0.0374	Supported**
PI -> SN	0.1642	2.9911	0.0320	Supported**
FR -> PBC	0.1397	2.4842	0.0131	Supported**
FI -> ATT	0.2568	4.5912	0.0000	Supported*
HB -> SN	0.1740	3.3582	0.0008	Supported*
INT -> PA	0.3288	6.7819	0.0000	Supported*
PBC -> INT	0.1954	2.8775	0.0041	Supported**
STK -> INT	0.1552	2.9106	0.0036	Supported**

SN -> PA	0.1760	2.7922	0.0053	Supported**
IC -> PA	0.4175	8.7263	0.0000	Supported*

Table 13 Model Summary of the extended TPB Model (* p<0.001 2 tailed and ** p<0.05 2 tailed)

5.5 Group analysis

In order to get a clearer idea and a deeper insight of the Catalan firms' participation in FLOS projects we divided our sample into two ones. The first is the high-tech one including companies that directly involved in the production of technology like manufacturers and developers of software and the other one includes companies that are involved in the commerce of technology, in IT consulting or in editing software or digital games. More specially, the first group includes these codes of CNAE (2611, 2612, 2620, 2630, 2640, 2680, 6110, 6120, 6130, 6190, 6201, 6311, 6312, 9511 and 9512) and on the other hand the non-high tech group includes these CNAE codes (4651, 4652, 5821, 5829, 6202 and 6209).

Table 12 represents the structural model's of high tech group statistical characteristics. As it is shown, not all the hypotheses of the modified model are supported at either 0.05 or 0.001 level, like in the case of the whole sample. Intention to Contribute is influenced positively by Attitude and Subjective Norm (β=0.114 and β=0.243 respectively). The Developers' Motivation has a positive effect at the Attitude and the Subjective Norm of the firm (β=0.224 and β=0.291 respectively). Perceived Importance influences positively the Subjective Norm of the firm (β=0.166), but on the other hand the hypothesis that Perceived Importance influences Subjective Norm is not supported. The Attitude is also influenced positively from the Firm's Involvement in FLOSS (β=0.161). In addition to, the Subjective Norm is positively influenced by the construct of Stakeholders (β=0.186) but is not influenced by Herding Behavior Since this hypothesis is not supported. Perceived Behavior Control influences positively the Intention to Contribute to FLOSS Communities (β=0.195). Finally,

Firm's Resources doesn't influence Perceived Behavior Control since this hypothesis is not supported.

Hypothesis	Standardized Path Coefficient (β)	t Value	p Value	Hypothesis Testing
ATT->INT	0.1137	2.2555	0.0242	Supported**
SN->INT	0.2428	4.0858	0.0000	Supported*
FI -> ATT	0.1615	2.8913	0.0039	Supported**
PI -> ATT	0.0292	0.6615	0.6615	Not Supported
PI -> SN	0.1661	3.4431	0.0006	Supported*
DM -> ATT	0.2240	2.7892	0.0053	Supported**
DM ->SN	0.2908	5.7261	0.0000	Supported*
STK -> SN	0.1885	3.5993	0.0003	Supported*
HB -> SN	0.0903	1.8401	0.0659	Not Supported
PBC -> INT	0.1954	2.8775	0.0041	Supported**
FR -> PBC	0.0083	0.2751	0.7833	Not Supported
INT -> PA	0.4425	9.4844	0.0000	Supported*

Table 14 Model Summary of the extended TPB model for high tech firms

Table 13 represents the structural model's of non high tech group statistical characteristics. As it is shown, not all the hypotheses of the modified model are supported at either 0.05 or 0.001 level. Intention to Contribute is influenced positively by Attitude and Subjective Norm ($\beta=0.279$ and $\beta=0.252$ respectively). The Developers' Motivation has a positive effect at the Subjective Norm of the firm ($\beta=0.150$) but not at Attitude since this hypothesis is not supported. Also, Perceived Importance influences positively the Attitude and the Subjective Norm of the firm ($\beta=0.160$ and $\beta=0.188$ respectively). The Attitude is also influenced positively from the Firm's Involvement in FLOSS ($\beta=0.393$). In addition to, the Subjective Norm is positively influenced by the constructs of Herding Behavior and Stakeholders ($\beta=0.270$ and $\beta=0.128$ respectively). Perceived Behavior Control influences positively the Intention to Contribute to FLOSS Communities ($\beta=0.195$). On the

other hand Firm's Resources has a negative effect at the Perceived Behavior Control (β=-0.109)

Hypothesis	Standardized Path Coefficient (β)	t Value	p Value	Hypothesis Testing
ATT->INT	0.2792	6.4560	0.0000	Supported*
SN->INT	0.2515	4.4727	0.0000	Supported*
FI -> ATT	0.3933	8.0851	0.0000	Supported*
PI -> ATT	0.1605	3.0257	0.0025	Supported**
PI -> SN	0.1885	3.2985	0.0010	Supported*
DM -> ATT	0.0718	1.9313	0.0536	Not Supported
DM ->SN	0.1498	2.3663	0.0181	Supported**
STK -> SN	0.1277	2.4075	0.0162	Supported**
HB -> SN	0.2699	5.0364	0.0000	Supported*
PBC -> INT	0.1954	2.8775	0.0041	Supported**
FR -> PBC	-0.1091	2.1906	0.0286	Supported*
INT -> PA	0.3805	7.4529	0.0000	Supported*

Table 15 Model summary of the extended TPB model for non high tech firms

6   CONCLUSIONS

The objective of this study has been to study the behavior of SMEs and their motivations to commit themselves to FLOSS communities. In order to analyze these motivations we applied and extended the Theory of Planned Behavior, which is an extended version of the Theory Reasoned Action. The first insight of this study that can be derived from this study are that the first four hypotheses of this model, which are the core of TPB and which were supported. This finding can add be added to the existing literature about the application of adoption models in an organizational context (eg Riemenschneider et. al., 2002). Also, in the context of FLOSS we can conclude that the attitude toward participation to FLOSS communities along with the subjective norm which is formulated by external environment of the decision maker influence positively their decision to contribute to FLOSS communities. Also we can conclude that the Perceived Behavior Control which sets the easiness or not to perform a certain behavior which in this case is the participation of SMEs to FLOSS communits plays a crucial role in their final decisión to participate to them. This is true for all three cases (whole sample, high tech firms, and non high tech firms), even though in the case of non high tech firms Attitude has a greater influence at Intention to Contribute. This can be explained by the fact that non high tech firms depend a lot to FLOSS but they core competencies is outside of this movement. They are heavy users of this technology and they can depend their business model in a asset which is not their core asset. So they have a better opinion about the benefits of the FLOSS environment can give them.

The second finding of this study is that the level of "openness" of a SME and the level of exposure to the FLOSS world influences positively their attitude toward participation to FLOSS communities, and indirectly their intention to contribute to FLOSS communities. This is compliant with the current literature

(Bonaccorsi et. al, 2006). Especially in the case of non high tech companies the influence of the level of "openness" is almost double of the influence of high tech companies. Until now, there is not previous literature, (according to author's knowledge) that supports this argument. But it can be explained as in the case of Attitude in the fact that technology is not their core asset.

The third finding is that the view of the future of FLOSS and its importance in an organizational context affect positively the attitude toward participation to FLOSS communities and the subjective norm to participation to them. This is also compliant with the current literature and especially with what Osterloh et. al. (2003) have mentioned in their work suggesting that companies need to gain the confidence of the community and that the managers are aware of what Dahlander and Wallin (2006) support by telling that firms need to access the developers of the FLOSS community and try to convert the knowledge created in the FLOSS community into a complementary asset. These arguments are not totally true in the case of high tech companies, since it seems that perceived importance doesn't influence Attitude. This can be explained by the fact that as these companies are developing technology have already their own opinion and attitude towards FLOSS, which cannot be easily influenced by the perceived importance of this technology. It seems that these companies do not depend heavily on the "type" of the software, open source or proprietary and think themselves as capable to change between these types of technology.

The fourth finding is that the developers of a firm and their motivations to contribute to FLOSS communities influence in a positive way the attitude toward the participation of a SME to FLOSS communities and the subjective norm to contribute to FLOSS communities. It seems that the developers of a SME who in their free or not time participate in FLOSS communities can act as promoters of FLOSS in an organizational context and can be an important force towards the adoption of a behavior like this. Again, in the case of non high tech companies the Developer's motivations do not influence their Attitude. It must be an expected result since

their core asset is not technology so the opinion of their developers (If they have anyone) cannot influence their opinion about participating to FLOSS communities.

The fifth finding is that the external environment such as governments and their policies, clients, providers or in general the stakeholders of a SME can influence positively the subjective norm to participate to FLOSS communities. Also the decisions of other companies important in the IT sector influence in a positive way the subjective norm to participation to FLOSS communities. This is compliant with previous literature about herding behavior and especially in the context of FLOSS (Miralles et. al. 2006). But, we can observe that Herding Behavior doesn't influence the Subjective Norm in the case of high tech firms. It seems that as these companies have a clearer perspective about the IT sector since apart from being users they are also producers of technology, so they are not influenced by the opinion and the decisions of other companies in the same sector.

Last but not least, the ultimate finding is that our hypothesis that the human, knowledge and finance capital of a SME influence positively their perception of how easy or not is to perform the contribution to FLOSS communities is supported. This hypothesis is supported in the whole sample but in the case of high tech firms. In other words, the size of a SME in the high tech sector is not a factor that can influence their decision. This is very important in the sense, that the SMEs that participate to FLOSS communities independently of their resources. This can also be justified with previous literature, according to which in the case with weak appropriability regimes like in FLOSS, the FLOSS communities can be seen as a complementary asset (Teece, 1986). And the ones that manage or "govern" these communities can increase their profits. So, even though SMEs in the high tech sector don't have the necessary resources enter in these communities, in order to gain assets and compete other more powerful companies. Moreover, in the case of non high tech firms, the firm's resources influence negatively their intention to contribute. In other words, the more the

resources they have they less intent to participate in these communities. This can again be justified by the nature of these companies. Their core asset is not technology so when they don't have these resources they will try to enter this world and get the complementary assets from the FLOSS communities. On the other hand if they have these resources they will try to create and develop this technology internally and not depend from the FLOSS communities.

In addition to, another contribution of this study was to represent the current status of the participation of SMEs of the ICT sector to FLOSS communities in Catalonia. The participation of the firms that use FLOSS in the FLOSS communities is mainly beta testing, since 37,9% of them participate in the beta testing procedure and also in the development of FLOSS applications as 30,5% of them is doing it. Another interesting point is that the vast majority of these companies develop FLOSS with the final purpose to use it internally. 50,6% of the companies that develop FLOSS commercializes it, and almost half of the companies that develop FLOSS (44,4%) share it with the FLOSS community.

This study has its own constraints. The major constraint of this study is a geographical one. Due to operational reasons this study took part in the region of Catalonia, so its results cannot be easily generalized. Catalonia's economical and social status could have played an important factor in the formulation of these results. The application of this study to other autonomous regions of Spain, or other countries could show us if the social, cultural and economic status have influenced the final results of this study.

Another limitation of course is the generalization of the findings of this study due to its exploratory nature and the relaitevely medium sample.

As a next step for future research, could be the inclusion of other industries in this analysis as not only IT related companies are involved in FLOSS projects. Also, a more careful analysis should

be made about the differences of the companies that participate in FLOSS communities and the ones that don't.

Motivations in FLOSS have always been a subject of great interest, by starting with the most obvious question, "why people work for free?". The motivations of developers have been well established (eg von Hippel (2001), Lerner and Tirole 2002). The same exists also for big and small companies adopting FLOSS based Business Models (eg Lakhani and von Hippel, 2003; Fitzgerald 2006; Krishnamurthy, 2004). However an increasing number of SMEs with strategies not directly related to the Business Model are contributing to FLOSS communities. In this study we try to investigate these motivations under a behavioral perspective by using a research model based on TPB. We demonstrated that factors like the "openness" of a SME, the perceived importance of FLOSS, the developers (employees) of a SME along with the external environment of a SME, could influence the decision of a SME to participate in FLOSS communities. Also, we have demonstrated that some differences can be identified between high tech firms and non high tech firms. These findings can help national or regional governments to design better policies in order to better promote the use and the participation of firms in FLOSS communities. Especially now, in times of heavy economical crisis in Europe, FLOSS can be an adequate solution to foster innovation.

6.1 Policy making

Evennthough, the scope of this study is not the proposal of some policies to the local government of Catalonia in order to increase the participation of SMEs to FLOSS communities we can derive some first interesting points regarding to the promotion of participation of SMEs to the FLOSS communities.

First, it seems really important in order to increase their participation to increase their perception about the future of FLOSS. FLOSS is one of the first successful examples of the open innovation model. One model that is based in the collaboration of a

lot of partners in the comparison with the classical closed innovation model. A lot of SMEs seem to be afraid of the future of FLOSS due to the fact that is a lot depended on the participation of individuals volunteers. By presenting that every year increases the percentatge of firms participating to the FLOSS world, the local government can gain the trust of the SMEs about the viability and the future of this environment.

A second thought is that the local government can increase the "openess" of an SME by demonstrating and promoting the use of new business models that can be built arounnd FLOSS and in general around the concept of open innovation. The more an SME is involved in the FLOSS world the more influenced will be its attitude towards FLOSS and its participation to the FLOSS communities.

As is presented in this study, the stakeholders can play an important role to the promotion of the participation of SMEs to FLOSS communities. One of important stakeholders is the local government of Catalonia. By subsidizing ICT projects based on FLOSS or by promoting the use of FLOSS in its own ICT projects can be a real boost to the involvement of SMEs in FLOSS.

Finally, one main point of the promotion of this behavior by the Catalan SMEs or in other words of the promotion of the participation of SMEs to FLOSS communities can be the fact that are firms that do not have the necessary capital in knowledge can participate in the peripheral activities of the FLOSS communities like the translation or the beta testing.

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Annex 1: CNAE Codes

CNAE-2009 CODIGO	CNAE-2009 TITULO
2611	Fabricación de componentes electrónicos
2612	Fabricación de circuitos impresos ensamblados
2620	Fabricación de ordenadores y equipos periféricos
2630	Fabricación de equipos de telecomunicaciones
2640	Fabricación de productos electrónicos de consumo
2651	Fabricación de instrumentos y aparatos de medida, verificación y navegación
2670	Fabricación de instrumentos de óptica y equipo fotográfico
2731	Fabricación de cables de fibra óptica
2732	Fabricación de otros hilos y cables electrónicos y eléctricos
2790	Fabricación de otro material y equipo eléctrico
2823	Fabricación de máquinas y equipos de oficina, excepto equipos informáticos
2829	Fabricación de otra maquinaria de uso general n.c.o.p.
2899	Fabricación de otra maquinaria para usos específicos n.c.o.p.
3250	Fabricación de instrumentos y suministros médicos y odontológicos

3312	Reparación de maquinaria
3313	Reparación de equipos electrónicos y ópticos
3314	Reparación de equipos eléctricos
3320	Instalación de máquinas y equipos industriales
4651	Comercio al por mayor de ordenadores, equipos periféricos y programas informáticos
4652	Comercio al por mayor de equipos electrónicos y de telecomunicaciones y sus componentes
5812	Edición de directorios y guías de direcciones postales
5814	Edición de revistas
5819	Otras actividades editoriales
5821	Edición de videojuegos
5829	Edición de otros programas informáticos
5920	Actividades de grabación de sonido y edición musical
6010	Actividades de radiodifusión
6020	Actividades de programación y emisión de televisión
6110	Telecomunicaciones por cable
6120	Telecomunicaciones inalámbricas
6130	Telecomunicaciones por satélite
6190	Otras actividades de telecomunicaciones
6201	Actividades de programación informática
6202	Actividades de consultoría informática
6203	Gestión de recursos informáticos

6209	Otros servicios relacionados con las tecnologías de la información y la informática
6311	Proceso de datos, hosting y actividades relacionadas
6312	Portales web
7733	Alquiler de maquinaria y equipo de oficina, incluidos ordenadores
9511	Reparación de ordenadores y equipos periféricos
9512	Reparación de equipos de comunicación

Annex 2: Questionnaire

P5   (A TOTS)

La seva empresa fa servir aplicacions i eines de programari lliure com Firefox, Apache, Open Office, Linux, etc?

¿Su empresa utiliza aplicaciones y herramientas de software libre cómo Firefox, Apache, Open Office, Linux, etc?

P6   (SI FAN SERVIR PROGRAMARI LLIURE)

Indiqui'm si us plau quines eines de programari lliure fan servir i per a quines àrees o serveis

Indíqueme por favor qué herramientas de software libre utilizan y para qué áreas o servicios

P7   (SI NO FAN SERVIR PROGRAMARI LLIURE)

Tenen intenció d'utilitzar eines de programari lliure a la seva empresa en el proper any?

¿Tienen intención de utilizar herramientas de software libre en el próximo año?

P9   (SI FAN SERVIR PROGRAMARI LLIURE)

Han portat a terme a la seva empresa alguna de les següents actuacions relacionades amb el programari lliure?

¿Han llevado a cabo en su empresa alguna de las siguientes actuaciones relacionadas con el software libre?

Desenvolupament total o parcial d'eines de programari lliure

Desarrollo total o parcial de herramientas de software libre

Finançament o donacions a projectes de programari lliure

Financiación o donaciones a proyectos de software libre

Patrocini d'un acte, conferència, publicació, etc. sobre programari lliure

Patrocinio de un acto, conferencia, publicación, etc. sobre software libre

Proves de programari lliure - test de versions beta

Pruebas de software libre - test de versiones beta

Traduir un programa de programari lliure

Traducir un programa de software libre

Escriure el manual d'un programa de programari lliure

Escribir el manual de un programa de software libre

Gestió d'un projecte de programari lliure per a la comunitat de programari lliure

Gestión de un proyecto de software libre para la comunidad de software libre

P9a (SI CREEN PRODUCTES A PARTIR DE PROGRAMARI LLIURE)

I quin és el destí dels productes obtinguts amb aquestes actuacions relacionades amb el software lliure?

¿Y cuál es el destino de los productos obtenidos con estas actuaciones relacionadas con el software libre?

Es destinen a l'ús intern de l'empresa

Se destinan al uso interno de la empresa

Es redistribueixen amb fins comercials

Se redistribuyen con fines comerciales

Es comparteixen amb la comunitat de software lliure

Se comparten con la comunidad de software libre

P10 (SI NO CONTRIBUEIXEN EN PROJECTES PER A LA COMUNITAT)

S'ha plantejat alguna vegada a la seva empresa la contribució en projectes per a la comunitat de programari lliure?

¿Se ha planteado alguna vez en su empresa la contribución en proyectos para la comunidad de software libre?

P11 (SI S'HO HAN PLANTEJAT)

Té la seva empresa intenció de contribuir en projectes per a la comunitat de programari lliure, ja sigui monetàriament o col·laborant-hi de manera activa?

¿Tiene su empresa intención de contribuir en proyectos para la comunidad de software libre, ya sea monetariamente o colaborando de forma activa?

P13 (SI NO CONTRIBUEIXEN EN PROJECTES PER A LA COMUNITAT)

Com creu que afectaria a la seva empresa contribuir en projectes per a la comunitat de programari lliure?

¿Cómo cree que afectaría a su empresa contribuir en proyectos para la comunidad de software libre?

(SI CONTRIBUEIXEN EN PROJECTES PER A LA COMUNITAT)

Com creu que afecta a la seva empresa contribuir en projectes per a la comunitat de programari lliure?

¿Cómo cree que afecta a su empresa contribuir en proyectos para la comunidad de software libre?

P13 (A TOTS)

Digui'm si us plau, en quina mesura creu que contribueixen al programari lliure les següents empreses relacionades.

Dígame por favor, en qué medida cree que contribuyen al software libre las siguientes empresas relacionadas con la suya.

P13a Les empreses que són importants per al desenvolupament de la seva empresa, com per exemple proveïdors o clients?

Las empresas que son importantes para el desarrollo de su empresa, cómo por ejemplo proveedores o clientes.

P13b Les empreses del seu sector que vosté valora positivament.

Las empresas de su sector que usted valora positivamente.

P13c Les empreses del seu sector, en general

Las empresas de su sector, en general

P14 (A TOTS)

Digui'm si us plau, en quina mesura creu que les empreses relacionades amb la seva pensen que empreses com la seva haurien de contribuir al programari lliure

Dígame por favor, en qué medida cree que las empresas relacionadas con la suya piensan que empresas como la suya deberían contribuir al software libre

P14a Les empreses que són importants per al desenvolupament de la seva empresa, com per exemple proveidors o clients

Las empresas que son importantes para el desarrollo de su empresa, como por ejemplo proveedores o clientes

P14b Les empreses del seu sector que vosté valora positivament

Las empresas de su sector que usted valora positivamente

que piensan o cómo piensan aquellas que sí conoce.

P14c Les empreses del seu sector

Las empresas de su sector

P15 (A TOTS)

En quina mesura creu que seria possible per a la seva empresa contribuir en projectes per a la comunitat de programari lliure?

¿En qué medida cree que sería posible para su empresa contribuir en proyectos para la comunidad de software libre?

P16 (A TOTS)

Està limitada o restringida la contribució de la seva empresa a projectes per a la comunitat de programari lliure per algun tipus d'acord preexistent, com per exemple restriccions de proveïdors o clients?

¿Está limitada o restringida la contribución de su empresa a proyectos para la comunidad de software libre por algún tipo de acuerdo preexistente, como por ejemplo restricciones de proveedores o clientes?

P17 (SI FAN SERVIR PROGRAMARI LLIURE)

El model de negoci de la seva empresa, està basat total o parcialment en programari lliure?

El modelo de negocio de su empresa, ¿está basado total o parcialmente en software libre?

P18a (A TOTS)

La seva empresa té relacions amb altres empreses que facin servir programari lliure?

¿Su empresa tiene relaciones con otras empresas que utilicen software libre?

P18b (A TOTS)

La seva empresa té relacions amb altres empreses que contribueixin en projectes per a la comunitat de programari lliure?

¿Su empresa tiene relaciones con otras empresas que contribuyan a proyectos para la comunidad de software libre?

P19 (A TOTS)

La seva empresa té relacions amb associacions de promoció i suport al programari lliure, com per exemple caliu, catux, catpl o hispalinux?

¿Su empresa tiene relaciones con asociaciones de promoción y apoyo al software libre, como por ejemplo caliu, catux, catpl o hispalinux?

P20 (A TOTS)

Participa en conferències o congressos sobre programari lliure?

¿Participa en conferencias o congresos sobre software libre?

P21   (A TOTS)

Es manté informat de les novetats en programari lliure?

¿Se mantiene informado de las novedades en software libre?

P22   (A TOTS)

Quina és la seva opinió sobre el futur del programari lliure en els propers 5 anys?

Cuál es su opinión sobre el futuro del software libre en los próximos 5 años?

P22   (A TOTS)

Digui'm si us plau, en quina mesura creu que és important la contribució dels següents actors per al futur del programari lliure.

Dígame por favor en qué medida cree que es importante la contribución de los siguientes actores para el futuro del software libre.

P22b La contribució de voluntaris, és a dir, de persones que desenvolupen software de forma desinteressada.

La contribución de voluntarios, es decir, de personas que desarrollan software de forma desinteresada

P22c La contribució d'empreses, sigui a nivell de finançament o de desenvolupament de software

La contribución de empresas, sea a nivel de financiación o de desarrollo de software

P22d   La contribució dels usuaris finals, tant a nivell de proves de software com de valoracions, donacions o suport en general

La contribución de los usuarios finales, tanto a nivel de pruebas como de valoraciones, donaciones o apoyo en general

P23   **(A TOTS)**

Digui'm si us plau, en quina mesura influeixen la opinió i les actuacions dels següents actors en la seva opinió sobre contribuir al software lliure.

Dígame por favor en qué medida influyen la opinión y las actuaciones de los siguientes actores en su opinión sobre contribuir al software libre.

P23a   La promoció del programari lliure per part de la Unió Europea o dels governs nacionals o regionals

La promoción del software libre por parte de la Unión Europea o de los gobiernos nacionales o regionales?

P23b   L'opinió dels mitjans de comunicació sobre programari lliure

La opinión de los medios de comunicación sobre software libre

P23c   l'opinió dels seus clients sobre programari lliure?

La opinión de sus clientes sobre software libre?

P23d   l'opinió dels seus proveïdors sobre programari lliure

La opinión de sus proveedores sobre software libre?

P24   (A TOTS)

Digui'm si us plau, en quina mesura afectarien a la opinió de la seva empresa sobre la contribució al software lliure possibles canvis en la opinió i actuació d'altres empreses.

Dígame por favor en qué medida afectarían a la opinión de su empresa sobre la contribución al software libre posibles cambios en la opinión y actuación de otras empresas.

P24a   Que la opinió de les grans empreses cap a la contribució en projectes de programari lliure fos més positiva

Que la opinión de las grandes empresas hacia la contribución en proyectos de software libre fuera más positiva

P24b   Que més empreses contribuïssin en projectes de programari lliure

Que más empresas contribuyeran en proyectos de software libre

P25a   (A TOTS)

Què creu vostè que és més fàcil, contribuir a projectes de programari lliure per al desenvolupament d'aplicacions verticals (específiques per a un mercat concret o una àrea de negoci) o bé per al desenvolupament d'aplicacions horitzontals (solucions genèriques com per exemple eines ofimàtiques).

Qué cree que es más fácil, contribuir a proyectos de software libre para el desarrollo de aplicaciones verticales (específicas para un mercado concreto o un área de negocio), o bien para el desarrollo de aplicaciones horizontales (soluciones genéricas cómo por ejemplo herramientas ofimáticas

P25b   (A TOTS)

Creu vostè que és més fàcil contribuir a projectes de programari lliure si el grup de futurs usuaris o públic objectiu és molt nombrós?

Cree usted que es más fácil contribuir a proyectos de software libre si el grupo de futuros usuarios o público es muy numeroso?

P26   (A TOTS)

¿Què creu vostè que és més fàcil, contribuir a un projecte de programari lliure amb un nombre elevat de participants (més de cinc) o a un amb un nombre petit de participants (5 o menys)?

¿Qué cree usted que es más fácil, contribuir a un proyecto con un número elevado de participantes (más de cinco) o con un número reducido de participantes (5 o menos)?

P27   (A TOTS)

La seva empresa té experiència en col·laborar en grans projectes? Considerem un projecte gran si la facturació o import total és de més de 500.000 euros

Su empresa ¿tiene experiencia en colaborar en grandes proyectos? Consideramos que un proyecto es grande si la facturación o importe total es de más de 500.000 euros.

P28   (SI CONTRIBUEIXEN EN PROJECTES PER A LA COMUNITAT)

En els projectes per a la comunitat de programari lliure en què participen, ho fan com a líders dels mateixos o com a col·laboradors?

En los proyectos para la comunidad de software libre en los que participan, lo hacen como líderes de los mismos o cómo colaboradores

P31 En quina mesura afecta l'opinió dels treballadors i col·laboradors de l'empresa a les decisions de la direcció?

En qué medida afecta la opinión de los trabajadores y colaboradores de la empresa a las decisiones de la dirección?

P29 Els treballadors o col·laboradors de la seva empresa, participen en projectes de programari lliure, ja sigui dins de l'empresa o a nivell particular?

Los trabajadores o colaboradores de su empresa, ¿participan en proyectos de software libre, ya sea dentro de la empresa o a nivel particular?

P30 Digui'm si us plau, quina és l'opinió general dels seus treballadors i col·laboradors respecte el programari lliure?

Dígame por favor, ¿cuál es la opinión general de sus trabajadores y colaboradores respecto al software libre?

P32 (SI NO CONTRIBUEIXEN EN PROJECTES PER A LA COMUNITAT)

Digui'm si us plau, en quina mesura seria probable que la seva empresa contribuís al software lliure si hi hagués una major disposició dels següents recursos:

Dígame por favor, en qué medida seria probable que su empresa contribuyera al software libre si hubiera una mayor disposición de los siguientes

P32a si tingués més recursos financers?

si tuviera más recursos financieros?

P32b   si comptés amb més recursos humans?

si contara con más recursos humanos?

P32c   si disposés d'un nivell més alt de coneixements?

si dispusiera de un nivel más alto de conocimientos?

Annex 3: Dataset

	TOTAL	Manfucatura	Comerç i reparacions	Serveis d'informàtica	1 a 2 treballadors	3 a 9 treballadors	10 a 149 treballadors
Base:Total entrevistas							
Muestra efectiva	303	30	63	210	130	100	73
Universo teórico (miles personas)	300	16	58	226	140	93	67
Sector							
Manufactura	5,3	100	-	-	3,3	5	10,1
Comerç i reparacions	19,3	-	100	-	17,6	26,3	13,2
Serveis d'informàtica	75,3	-	-	100	79,1	68,7	76,7
Nº empleats							
De 1 a 2 treballadors	46,7	28,9	42,5	49	100	-	-
De 3 a 9 treballadors	31	28,8	42,2	28,3	-	100	-
De 10 a 149 treballadors	22,3	42,2	15,3	22,7	-	-	100
P5. La seva empresa fa servir aplicacions i eines de programari lliure?							
Sí	70,1	46,4	68,2	72,3	62,9	74,6	79,1
No	29,5	53,6	31,8	27,2	36,3	25,4	20,9
NC	0,4	-	-	0,5	0,8	-	-
P6. Indiqui'm si us plau quines eines de programari lliure fan servir							

Base:Fan servir programari lliure	210	7	40	163	88	69	53
Amanda	0,5	-	-	0,6	-	-	1,9
Apache Server	24,9	36,5	9,7	28	24,2	15,2	38,8
Apache Tomcat	1,2	6,9	-	1,2	-	2,2	1,9
ArgoUML	0,5	-	-	0,7	1,3	-	-
Autodock	0,5	-	-	0,7	1,3	-	-
Bacula	0,5	-	-	0,6	-	-	1,9
Bluedragon	0,5	-	-	0,6	-	1,5	-
Chrome	6,7	-	11,6	5,8	4,8	8,2	7,8
Collabtive	0,5	-	-	0,7	1,3	-	-
Debian	0,5	13,9	-	-	-	0,7	1
Dotproject	0,5	-	-	0,6	-	1,5	-
Drupal	0,5	-	-	0,7	1,3	-	-
Eclipse	3,9	-	-	5,1	1,3	8,8	1,9
Ethereal	0,2	7	-	-	-	-	1
Evolution	0,5	-	-	0,7	1,3	-	-
Fedora	1	-	-	1,3	1,3	-	1,9
FileZilla	3,9	7	-	4,7	5,2	2,9	2,9
Firebird	1	-	2,5	0,6	1,1	-	1,9
Gadwin	0,5	-	-	0,6	-	-	1,9
Gimp	5	7	2,5	5,5	8,9	-	4,9
GLPI	0,5	-	-	0,6	-	-	1,9
Horde	0,5	-	-	0,7	1,3	-	-
Hylafax	0,2	7	-	-	-	-	1
Inkscape	1,6	-	-	2	3,8	-	-
Irfanview	0,5	-	2,5	-	1,1	-	-
Izarc	0,5	-	-	0,6	-	-	1,9
Java	2,6	-	-	3,4	3,9	1,5	1,9
Joomla	1,9	-	2,2	1,9	1,3	2,7	1,9
KMail	0,2	6,9	-	-	-	0,7	-

Konqueror	0,2	6,9	-	-	-	0,7	-
Linux	37	36,5	30,8	38,5	38,9	37,9	32,4
Livezilla	0,5	-	-	0,6	-	1,5	-
Moodle	0,5	-	-	0,6	-	-	1,9
Mozilla Firefox	64	86,1	64,7	62,9	63,7	61,9	67,4
Mozilla Sunbird	37	36,5	30,8	38,5	38,9	37,9	32,4
Mozilla Thunderbird	10,2	20,8	6,9	10,4	8,9	10	12,3
MySQL	8,6	-	-	11,1	7,8	7,3	11,6
Naview	0,5	-	-	0,6	-	-	1,9
OCS inventory	0,5	-	-	0,6	-	-	1,9
Open office	44,7	41,8	44,3	45	43,8	49,4	40,2
Password safe	0,5	-	-	0,6	-	-	1,9
PCP	0,5	-	2,5	-	1,1	-	-
Php	6,1	-	-	7,9	6,5	5,8	5,8
Postfix	1	14,8	-	0,6	0,7	-	2,9
PostgreSQL	1	-	-	1,2	-	1,5	1,9
Prestashop	0,4	-	2,2	-	-	1,3	-
Project open	0,5	-	-	0,7	1,3	-	-
PureFTPd	0,5	-	-	0,6	-	-	1,9
Radius	0,5	-	-	0,6	-	1,5	-
Samba	0,5	-	2,5	-	1,1	-	-
SQL	0,5	-	-	0,7	1,3	-	-
Sugar CRM	1	-	2,5	0,6	1,1	-	1,9
Ubuntu	5,5	-	6,9	5,4	8,9	4,2	1,7
Virtualbox	1,1	-	-	1,4	2,6	-	-
VNC viewer	0,5	-	-	0,7	1,3	-	-
Vtiger	1,5	-	-	1,9	-	2,9	1,9
Wordpress	1,4	-	4,4	0,7	1,3	2,5	-
Xen	0,2	7	-	-	-	-	1
Zimbra	0,5	-	-	0,6	-	-	1,9
JUnit	0,5	-	-	0,6	-	1,5	-
Selenium	0,5	-	-	0,6	-	1,5	-

SeaMonkey	0,5	-	-	0,7	1,3	-	-
GCC	0,5	-	-	0,7	1,3	-	-
Asterisk	0,4	-	2,2	-	-	-	1,7
Open VPN	0,5	-	-	0,7	1,3	-	-
Mambo	1	-	-	1,2	-	2,9	-
Mantis	1	-	-	1,2	-	2,9	-
No open source	8	7	12,2	7	7,1	10	6,8
No identificables	3,8	6,9	2,5	3,9	3,7	0,7	7,8
NS	3,3	-	7	2,6	2,4	1,5	7,2
NC	2,9	-	4,4	2,7	3,9	2,7	1,7
Tipus de software Específic							
Llenguatge de programació per bases de dades	0,5	-	-	0,7	1,3	-	-
Motor de base de dades relacional	9,6	-	2,5	11,7	8,9	7,3	13,6
Colecció de compiladors	0,5	-	-	0,7	1,3	-	-
Creació de diagrames UML	0,5	-	-	0,7	1,3	-	-
EDI	3,9	-	-	5,1	1,3	8,8	1,9
Llenguatge de programació	2,6	-	-	3,4	3,9	1,5	1,9
Test d'aplicacions java	0,5	-	-	0,6	-	1,5	-
Aplicació web de ecommerce	0,4	-	2,2	-	-	1,3	-
Gestor de continguts	4,8	-	6,6	4,6	3,9	8,2	1,9
Missatgeria instantània per al web	0,5	-	-	0,6	-	1,5	-
Programació web	6,1	-	-	7,9	6,5	5,8	5,8
Programació web CFML	0,5	-	-	0,6	-	1,5	-

Seguiment de bugs / errors	1	-	-	1,2	-	2,9	-
Test d'aplicacions web	0,5	-	-	0,6	-	1,5	-
Test d'estructures de navegació	0,5	-	-	0,6	-	-	1,9
Administració de recursos informàtics	1	-	-	1,3	-	-	3,9
CRM	2,4	-	2,5	2,5	1,1	2,9	3,9
ERP	0,5	-	-	0,7	1,3	-	-
Ambient educatiu virtual	0,5	-	-	0,6	-	-	1,9
Client de correu electrònic	10,4	27,7	6,9	10,4	8,9	10,8	12,3
Eines colaboratives	2,1	-	-	2,7	2,6	1,5	1,9
Navegador web	65,5	86,1	67,2	64,1	64,8	64,8	67,4
Navegador web / explorador fitxers	0,2	6,9	-	-	-	0,7	-
Solució FTP	4,4	7	-	5,3	5,2	2,9	4,9
Suite ofimàtica per Internet	0,5	-	-	0,7	1,3	-	-
Aplicació de calendari	0,5	-	-	0,6	-	-	1,9
Gestió de contrasenyes	0,5	-	-	0,6	-	-	1,9
Captura d'imatges	0,5	-	-	0,6	-	-	1,9
Edició de gràfics vectorials	1,6	-	-	2	3,8	-	-
Edició d'imatges	5	7	2,5	5,5	8,9	-	4,9
Visor d'imatges i video	0,5	-	2,5	-	1,1	-	-
Suite ofimàtica	44,7	41,8	44,3	45	43,8	49,4	40,2
Agent de transport de correu	1	14,8	-	0,6	0,7	-	2,9
Servidor web	24,9	36,5	9,7	28	24,2	15,2	38,8

Servidor web / contenidor de servlets	1,2	6,9	-	1,2	-	2,2	1,9
Distribució Linux	40,4	50,4	35,2	41,2	42,8	39,9	37
Classificació supervisada de patrons	0,5	-	2,5	-	1,1	-	-
Eina de predicció d'anclatge de molècules	0,5	-	-	0,7	1,3	-	-
Compresor ZIP/RAR	0,5	-	-	0,6	-	-	1,9
Control remot d'ordinadors	0,5	-	-	0,7	1,3	-	-
Virtualitzador	1,3	7	-	1,4	2,6	-	1
Anàlisi de protocols de xarxa	0,2	7	-	-	-	-	1
Centraleta telefònica basada en software	0,4	-	2,2	-	-	-	1,7
Protocol d'autenticació i autorització per accés a xarxes	0,5	-	-	0,6	-	1,5	-
Protocol de fitxers per integració de sistemes	0,5	-	2,5	-	1,1	-	-
Servidor fax	0,2	7	-	-	-	-	1
Solució de Backup de xarxes	0,5	-	-	0,6	-	-	1,9
Solució de conectivitat basada en software	0,5	-	-	0,7	1,3	-	-
Tipus de software Genèric							
Bases de dades	10,1	-	2,5	12,4	10,2	7,3	13,6

Desenvolupament de software	6	-	-	7,8	5,2	8,8	3,9
Desenvolupament web	12,9	-	6,6	15	10,4	18,4	9,7
Eines de gestió de sistemes informàtics	1	-	-	1,3	-	-	3,9
Eines de gestió empresarial	3	-	2,5	3,2	2,4	2,9	3,9
Eines ofimàtiques de comunicació	69,5	86,1	67,2	69,2	67,4	70,6	71,3
Eines ofimàtiques de gestió d'informació personal	1	-	-	1,3	-	-	3,9
Eines ofimàtiques de imatge	6,5	7	5	6,8	12,5	-	4,9
Eines ofimàtiques per documents	44,7	41,8	44,3	45	43,8	49,4	40,2
Servidor de correu	1	14,8	-	0,6	0,7	-	2,9
Servidor web	24,9	36,5	9,7	28	24,2	15,2	38,8
Sistemes operatius	40,4	50,4	35,2	41,2	42,8	39,9	37
Software científic específic	1	-	2,5	0,7	2,4	-	-
Utilitats	1,8	7	-	2	2,6	-	2,9
Xarxes	2,7	7	4,7	1,9	2,4	1,5	4,6
Tenen intenció d'utilitzar eines de programari lliure a la seva empresa en el proper any?							
Base: No fan servir programari lliure	88	9	18	61	51	24	14
Sí	9,6	13,5	16,1	7	12,6	4,3	7,3
No	84,4	86,5	79,2	85,7	80,6	87,7	92,7
No sabe	6	-	4,7	7,2	6,8	8	-
P9. Han portat a terme a la seva empresa alguna de les següents actuacions relacionades amb el programari lliure							

Base:Fan servir programari lliure	210	7	40	163	88	69	53
Desenvolupament total o parcial d'eines de programari lliure	31,4	28,7	27,7	32,4	25,9	33,4	38
Finançament o donacions a projectes de programari lliure	11,2	21,7	6,7	11,8	9,8	10,8	14
Patrocini d'un acte, conferència, publicació, etc. sobre programari lliure	6,8	13,9	6,9	6,4	3,7	10,8	6,5
Proves de programari lliuretest de versions beta	40,4	42,6	47,1	38,6	44,2	41	33,2
Traduir un programa de programari lliure	17,6	20,8	19,1	17,1	21,2	17,4	12,1
Escriure el manual d'un programa de programari lliure	12,3	13,9	8,9	13	9,1	13,5	16
Gestió d'un projecte de programari lliure per a la comunitat de programari lliure	14,5	7,8	13,9	14,9	12	14,4	18,6
Cap de les anteriors	37,9	42,6	32,4	39	43,8	32,2	35,4
No sabe	0,5	-	-	0,6	-	1,5	-
No contesta	1,5	-	-	1,9	-	2,9	1,9
P9A. I quin és el destí dels productes obtinguts amb aquestes actuacions relacionades amb el software lliure?							
Base: Creen productes a partir de programari	85	3	17	65	30	30	24

lliure							
Es destinen a l'ús intern de l'empresa	79,2	100	78,6	78,5	74,7	87,1	74,9
Es redistribueixen amb fins comercials	48,1	38,8	37,7	51,3	58,2	32,4	55,2
Es comparteixen amb la comunitat de software lliure	42,2	58,7	42,8	41,3	50,7	37,4	37,5
No contesta	7,4	-	5,1	8,3	7,5	3,3	12,3
P10. S'ha plantejat alguna vegada a la seva empresa la contribució en projectes per a la comunitat de programari lliure							
Base: No contribueixen en projectes per a la comunitat	98	4	16	79	41	31	26
Sí	9,5	27,6	-	10,5	2,8	4,9	25,8
No	84,2	72,4	100	81,6	94,5	82,1	70,3
No sabe	3,2	-	-	4	2,8	6,5	-
No contesta	3,1	-	-	3,9	-	6,5	4
Té la seva empresa intenció de contribuir en projectes per a la comunitat de programari lliure, ja sigui monetàriament o col·laborant hi de manera activa							
Base: S'han plantejat contribuir	9	1	0	8	1	2	7
Sí	67	100	-	63	100	100	53,9
No	33	-	-	37	-	-	46,1
I1.Index de proximitat a la contribució							

Base: Total entrevistas	300	16	58	226	140	93	67
No fan servir ni tenen intenció	27	46,4	26,7	25,8	32,5	24,3	19,4
No fan servir però tenen intenció	2,8	7,2	5,1	1,9	4,6	1,1	1,5
Fan servir, no col·laboren ni s'ho han plantejat	29,7	16,9	26,8	31,3	28,7	31,9	28,7
Fan servir, no col·laboren però s'ho han plantejat	1	-	-	1,4	-	-	4,6
Fan servir, no col·laboren però tenen intenció	2,1	6,5	-	2,3	0,8	1,6	5,4
Col·laboren en comunitats de major implicació	15,4	10,1	11	16,9	11,6	16,1	22,4
Col·laboren en comunitats de menor implicació	21,9	12,9	30,4	20,4	21,8	25	18

P13.Com creu que afectaria a la seva empresa contribuir en projectes per a la comunitat de programari lliure?

Base: Fan servir programari lliure	210	7	40	163	88	69	53
1 Molt contraproduent	6,6	-	5	7,2	8,7	7,3	1,9
2	2,6	7	4,4	2	1,3	1,3	6,5
3	13,7	7,8	8,9	15,1	13,7	16,9	9,4
4	19,3	7,8	8,9	22,4	21,3	14,2	22,7
5	24,3	28,8	25,5	23,8	16,8	31	27,9
6	12,3	27,7	11,4	11,9	11,5	10,6	16
7 Molt beneficiós	15,1	14	29,1	11,8	20,3	9,6	13,6

NS	4,7	6,9	6,9	4	6,3	6,2	-
NC	1,5	-	-	1,9	-	2,9	1,9
Media	4,59	5,12	5,1	4,45	4,62	4,44	4,74
Desviación	1,66	1,41	1,77	1,62	1,81	1,59	1,48

P13b.Com creu que afectaria a la seva empresa contribuir en projectes per a la comunitat de programari lliure?

Base: No contribueixen en projectes per a la comunitat	98	4	16	79	41	31	26
1 Molt contraproduent	13	-	12,7	13,7	18,6	13	4
2	4,2	-	5,7	4	2,8	-	11,3
3	19,7	15,5	22,5	19,3	23,6	21,4	11,3
4	21,3	15,5	5,6	24,7	26,4	9,3	27,7
5	20,9	13,9	29,5	19,5	7,6	34,4	25,8
6	4,2	27,6	-	3,9	-	1,6	13,9
7 Molt benefICIós	6,8	13,9	12	5,5	10,4	6,1	2
NS	6,9	13,7	12	5,6	10,7	7,7	-
NC	3,1	-	-	3,9	-	6,5	4
Media	3,81	5,1	3,93	3,73	3,48	3,95	4,14
Desviación	1,66	1,36	1,83	1,61	1,77	1,65	1,41

P13a.Com creu que afecta a la seva empresa contribuir en projectes per a la comunitat de programari lliure?

Base:Contribueixen en projectes per a la comunitat	112	4	24	84	47	38	27
1 Molt contraproduent	0,9	-	-	1,2	-	2,7	-
2	1,2	14,1	3,6	-	-	2,3	1,9

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3	8,4	-	-	11,2	4,9	13,3	7,6
4	17,6	-	11	20,2	16,8	18,2	17,9
5	27,3	43,9	22,8	27,8	25	28,1	29,9
6	19,5	27,8	18,8	19,3	21,7	17,9	17,9
7 Molt beneficiós	22,4	14,1	40,1	17,7	29,1	12,6	24,7
NS	2,7	-	3,6	2,6	2,4	4,9	-
Media	5,23	5,14	5,8	5,08	5,55	4,8	5,28
Desviación	1,36	1,45	1,29	1,34	1,22	1,45	1,32

P13BA. En quina mesura creu que contribueixen al programari lliure les següents empreses relacionades amb la seva. Les empreses que són importants per

Base:Total entrevistas	300	16	58	226	140	93	67
1 Cap d'elles hi contribueix	34,3	37,9	27	35,9	39,2	33,9	24,7
2	13,2	10	10,8	14,1	10	16,7	15,1
3	12,5	23	15,7	10,9	10,7	14,1	14
4	10,4	-	9,6	11,4	10,3	8,4	13,6
5	12,4	12,9	12,9	12,2	10,2	12,1	17,5
6	2,8	-	4,9	2,4	3,9	0,9	3,1
7 Totes contribueixen	3,7	6,5	8,1	2,4	3,7	2,6	5,2
NS	10,3	9,7	10,9	10,1	11,2	11,2	6,9
NC	0,4	-	-	0,5	0,8	-	-
Media	2,74	2,62	3,2	2,63	2,65	2,56	3,15
Desviación	1,8	1,83	1,98	1,72	1,85	1,65	1,81

P13BB. En quina mesura creu que contribueixen al programari lliure les següents empreses relacionades amb la seva. Les empreses del seu sector que vos

1 Cap d'elles hi contribueix	21,7	37,1	19,7	21,2	26,9	17	17,5
2	13,4	6,8	14,4	13,6	12,1	16,3	12,1

3	15,5	13,3	17,2	15,2	13,2	14,5	21,6
4	12,2	16,8	12,7	11,7	9,5	16,3	12,1
5	15,8	3,2	15,5	16,8	16,1	12,2	20,3
6	7,6	6,5	9,8	7,1	7,7	8	6,7
7 Totes contribueixen	2,6	9,7	3,2	1,9	2,3	2	3,9
NS	10,1	6,5	7,6	11	9,8	13,6	5,9
NC	1,1	-	-	1,5	2,4	-	-
Media	3,23	3,01	3,35	3,21	3,09	3,26	3,44
Desviación	1,78	2,07	1,79	1,75	1,85	1,7	1,72

P13BC. En quina mesura creu que contribueixen al programari lliure les següents empreses relacionades amb la seva. Les empreses del seu sector, en gen

1 Cap d'elles hi contribueix	17,1	29,9	11,5	17,7	19,1	17,2	13,1
2	16,3	21,3	15,7	16,1	15,5	12,1	23,7
3	18,3	16	21,2	17,7	20,3	17,4	15,1
4	13,4	-	15,5	13,8	12	17,6	10,3
5	15,4	16,2	18,9	14,4	15,9	13,7	16,7
6	5,8	3,6	9,5	5,1	3,5	8,3	7,5
7 Totes contribueixen	1,9	3,2	1,7	1,9	1,5	1,1	3,8
NS	11,4	9,7	6	12,9	11,3	12,6	9,8
NC	0,4	-	-	0,5	0,8	-	-
Media	3,21	2,73	3,53	3,16	3,08	3,32	3,35
Desviación	1,65	1,77	1,59	1,64	1,59	1,64	1,73

P14A. Digui'm si us plau, en quina mesura creu que les empreses relacionades amb la seva pensen que empreses com la seva haurien de contribuir al prog

1 La majoria no ho pensa	31,5	33,5	28,1	32,2	34,2	30,9	26,7
2	13,1	13,3	14,2	12,8	11,5	14,8	13,9
3	15,7	10,4	11,7	17,1	17,3	16,8	10,7

4	14,8	20,1	15,9	14,1	11,8	16,7	18,2
5	10,5	19,4	14	8,9	7	9,4	19,1
6	4,8	-	9,8	3,8	6,1	5,2	1,5
7 La majoria ho pensa	2,5	-	1,5	2,9	3,3	0,9	3,1
NS	6,5	3,2	4,7	7,2	7,1	5,3	6,7
NC	0,8	-	-	1	1,6	-	-
Media	2,83	2,78	3,09	2,76	2,75	2,77	3,06
Desviación	1,72	1,58	1,8	1,71	1,78	1,62	1,73

P14B. Digui'm si us plau, en quina mesura creu que les empreses relacionades amb la seva pensen que empreses com la seva haurien de contribuir al prog

1 La majoria no ho pensa	23,3	27	21,9	23,4	23,7	24,3	21,3
2	10,4	13,6	12,7	9,5	10,3	10,5	10,3
3	13,6	12,9	14,7	13,4	15,7	13,7	9,2
4	14,8	10,1	14,5	15,2	14,6	16,3	13
5	16,4	26,6	20,5	14,7	14,2	14,1	24,3
6	9	-	6,4	10,3	7,1	12,8	7,7
7 La majoria ho pensa	3	3,2	4,7	2,5	4	0,9	3,6
NS	8,4	6,5	4,5	9,6	8,9	6,2	10,5
NC	1,1	-	-	1,5	1,6	1,1	-
Media	3,33	3,09	3,39	3,33	3,25	3,3	3,52
Desviación	1,83	1,76	1,82	1,84	1,83	1,81	1,86

P14C. Digui'm si us plau, en quina mesura creu que les empreses relacionades amb la seva pensen que empreses com la seva haurien de contribuir al prog

1 La majoria no ho pensa	23,5	30,3	21,9	23,4	23,7	23,7	22,8
2	10,6	13,6	7,9	11	12	8,4	10,5
3	18,7	20,2	22,5	17,6	19,7	20,5	14,2
4	14,1	12,9	17,6	13,2	12,5	17,4	12,6

5	15	10,1	14,4	15,5	12,1	11,7	25,5
6	5,8	6,5	6,2	5,7	4,8	8,8	3,8
7 La majoria ho pensa	2,8	-	4,9	2,5	4,7	0,9	1,5
NS	8,8	6,5	4,5	10,1	9,7	7,3	9
NC	0,7	-	-	1	0,8	1,1	-
Media	3,17	2,77	3,35	3,15	3,12	3,17	3,27
Desviación	1,74	1,61	1,75	1,74	1,78	1,68	1,72

P15. ¿En quina mesura creu que seria possible per a la seva empresa contribuir en projectes per a la comunitat de programari lliure ?

Base:Total entrevistas	300	16	58	226	140	93	67
1 Totalment impossible	24,9	13,3	27,2	25,2	31,4	23,5	13,4
2	13,3	13,3	15,7	12,7	10,7	15,5	15,9
3	15,5	23	7,8	17	13,3	16,2	19,3
4	16,6	20,2	13,8	17	13	16,2	24,7
5	16,4	10,5	24,4	14,8	18,6	15,5	13
6	4,9	6,5	3,4	5,1	4,6	3,8	6,9
7 Totalment possible	7,7	13,3	6,2	7,7	7,7	9,4	5,4
NS	0,3	-	1,5	-	-	-	1,3
NC	0,4	-	-	0,5	0,8	-	-
Media	3,32	3,74	3,28	3,3	3,21	3,34	3,51
Desviación	1,88	1,86	1,91	1,87	1,96	1,9	1,65

P15a. ¿En quina mesura creu que seria possible per a la seva empresa contribuir en projectes per a la comunitat de programari lliure ?

Base: Fan servir programari lliure	210	7	40	163	88	69	53

1 Totalment impossible	18,4	-	18,8	19,2	22,7	18,4	11,4
2	14,4	21,7	16,1	13,7	13,3	14,6	16,2
3	15,6	20,9	7	17,4	12,7	19,7	15
4	17,8	21	18	17,6	14,1	15,1	27,6
5	20	7,8	28,8	18,4	25,2	16,7	15,5
6	4,7	6,9	-	5,8	3,8	5,1	5,8
7 Totalment possible	8,6	21,7	9,1	7,9	8,3	10,4	6,8
NS	0,4	-	2,2	-	-	-	1,7
Media	3,55	4,22	3,6	3,51	3,5	3,54	3,65
Desviación	1,84	1,83	1,85	1,83	1,9	1,88	1,66

P15b. ¿En quina mesura creu que seria possible per a la seva empresa contribuir en projectes per a lacomunitat de programari lliure ?

Base: No contribueixen en projectes per a la comunitat	98	4	16	79	41	31	26
1 Totalment impossible	28,6	-	41,6	27,3	34,9	27,9	19,3
2	20,3	29,2	17,6	20,4	23,2	20,2	15,8
3	18,1	27,6	-	21,3	11,1	24,4	21,8
4	14,6	27,8	16,9	13,5	11,1	14,9	19,9
5	11,7	-	12,7	12,1	13,1	6,5	15,8
6	2,2	-	-	2,7	5,2	-	-
7 Totalment possible	3,6	15,5	5,6	2,6	1,4	6,1	4
NS	0,9	-	5,7	-	-	-	3,4
Media	2,81	3,6	2,62	2,81	2,66	2,76	3,13
Desviación	1,65	1,64	1,86	1,59	1,68	1,62	1,57

P16. La contribució de la seva empresa a projectes per a la comunitat de programari lliure, està limitada o restringida per algun tipus d'acord preexi

Base: Total entrevistas	300	16	58	226	140	93	67
1 Totalment restringida	5	-	3	5,9	6,5	4,1	3,1
2	3	6,4	3	2,8	0,8	5,2	4,6
3	5,1	6,5	6,2	4,7	4	6,8	5,2
4	5,3	3,2	6,2	5,1	3,2	5,2	9,8
5	8,5	7,2	9,5	8,3	5,5	11,5	10,5
6	7,5	9,7	9,6	6,7	8,7	7,9	4,4
7 Depèn exclusivament de l'empresa	63,6	67	59,4	64,5	69,7	58,5	58,1
NS	1,3	-	3	0,9	-	0,9	4,4
NC	0,8	-	-	1	1,6	-	-
Media	5,92	6,08	5,91	5,91	6,1	5,75	5,78
Desviación	1,78	1,57	1,68	1,82	1,74	1,82	1,77

P17. El model de negoci de la seva empresa, està basat total o parcialment en programari lliure?

Base: Fan servir programari lliure	210	7	40	163	88	69	53
Sí	34,1	28,6	37,7	33,5	38,2	32,4	29,5
No	65,9	71,4	62,3	66,5	61,8	67,6	70,5

P18A. La seva empresa té relacions amb altres empreses que facin servir programari lliure?

Base: Total entrevistas	300	16	58	226	140	93	67
Sí	46,4	50	48,2	45,7	47,4	44,2	47,5
No	42,3	36,7	37,5	43,9	41,3	40,8	46,3
No sabe	10,9	13,3	14,3	9,9	10,5	15,1	6,2

No contesta	0,4	-	-	0,5	0,8	-	-

P18B. La seva empresa té relacions amb altres empreses que contribueixin en projectes per a la comunitat de programari lliure?

Sí	24,2	33,1	25,7	23,2	22	20,5	33,9
No	57,3	50,3	54,1	58,6	58,5	56,3	56,3
No sabe	18,1	16,6	20,2	17,7	18,7	23,2	9,8
No contesta	0,4	-	-	0,5	0,8	-	-

P19. La seva empresa té relacions amb associacions de promoció i suport al programari lliure?

Sí	5,3	9,7	4,7	5,1	3,2	5,9	9
No	91,9	90,3	92,1	91,9	92,9	91	91
No sabe	2,4	-	3,2	2,4	3,2	3,1	-
No contesta	0,4	-	-	0,5	0,8	-	-

P20. Participa en conferències o congressos sobre programari lliure?

Sí, com a assistent	16,6	12,9	14	17,5	14,4	21,1	14,9
Sí, com a ponent	4,7	9,7	1,7	5,1	2,3	5,5	8,4
No	81,1	83,8	86	79,6	83,2	77,8	81,2
No contesta	0,4	-	-	0,5	0,8	-	-

P21. Es manté informat de les novetats en programari lliure?

Sí	66,9	53,2	59	69,9	61	71,4	73,2
No	32,3	46,8	41	29,1	37,4	28,6	26,8
No sabe	0,4	-	-	0,5	0,8	-	-
No contesta	0,4	-	-	0,5	0,8	-	-
Index de participació en el software lliure							

1	12,4	30,2	15,7	10,2	14,8	11,8	8
2	9,2	3,2	17,2	7,6	7,8	8,9	12,6
3	20,6	3,2	6,2	25,5	17,8	25,7	19,2
4	29,9	30,2	30,8	29,6	34,2	25,3	27,2
5	17,3	20,2	22,1	15,9	19,1	14,4	17,8
6	5,7	-	6,2	6	3,2	8,4	7,5
7	4,9	12,9	1,7	5,1	3,2	5,5	7,7
P22. Quina és la seva opinió sobre el futur del programari lliure en els propers 5 anys?							
1 Molta menys importància	2,4	3,6	3,4	2	5,1	-	-
2	6,1	13,7	1,5	6,8	8,2	5,9	2,3
3	12,8	13,3	9,3	13,7	10,1	19,2	9,6
4	13,5	10,1	7,9	15,2	14	11,2	15,9
5	22,6	26,7	18,9	23,3	21,6	23,1	24,2
6	18,3	19,7	28,9	15,4	15,6	21,9	18,8
7 Molta més importància	21,8	9,7	28,4	21	20,6	18,8	28,5
NS	2	3,2	1,7	2	4	-	0,8
NC	0,4	-	-	0,5	0,8	-	-
Media	4,95	4,45	5,42	4,86	4,77	4,92	5,34
Desviación	1,64	1,68	1,56	1,64	1,78	1,54	1,41
P22A. Digui'm si us plau, en quina mesura creu que és important la contribució dels següents actors per al futur del programari lliure: La contribució							
1 No és gens important	2,9	-	-	3,9	4,1	2,2	1,5
2	1,5	3,2	-	1,8	-	2,7	3,1
3	8,1	13,3	6	8,3	9,4	8,1	5,4
4	9,1	7,2	7,8	9,5	8,9	9,4	9
5	19,3	27	22,1	18,1	18,7	20,1	19,8

6	18,9	23	21,4	18	19	16,6	21,8
7 És extremadament important	38,6	23	39,5	39,5	38,4	40,9	35,8
NS	1,1	3,2	3,2	0,5	0,7	-	3,6
NC	0,4	-	-	0,5	0,8	-	-
Media	5,55	5,26	5,83	5,5	5,53	5,56	5,61
Desviación	1,58	1,43	1,22	1,66	1,62	1,58	1,48

P22B. Digui'm si us plau, en quina mesura creu que és important la contribució dels següents actors per al futur del programari lliure: La contribució

1 No és gens important	3,9	3,6	4,5	3,8	3,7	6,2	1,3
2	4	3,6	1,5	4,7	4,4	5,3	1,5
3	10,1	16,9	6,2	10,7	12,2	7,7	9,2
4	9	6,5	9,5	9	7,9	11,2	8
5	25,8	26,6	16,5	28,1	27	17,3	34,9
6	21,7	22,6	27	20,2	17,9	29,2	19
7 És extremadament important	23,8	20,2	31,6	22	24,6	22	24,7
NS	1,3	-	3,2	1	1,5	1,1	1,3
NC	0,4	-	-	0,5	0,8	-	-
Media	5,12	4,97	5,47	5,05	5,07	5,06	5,32
Desviación	1,64	1,64	1,62	1,63	1,67	1,76	1,38

P22C. Digui'm si us plau, en quina mesura creu que és important la contribució dels següents actors per al futur del programari lliure: La contribució

1 No és gens important	3	3,2	1,5	3,4	3,3	4,2	0,8
2	2	-	3	1,9	1,6	3,1	1,3
3	6,3	13,6	3,2	6,6	5,6	5,3	9,2
4	14,9	13,7	14,5	15,1	15,7	17,4	10

5	20,7	19,9	21	20,7	24,1	12,5	24,9
6	20	16,5	23,6	19,3	16,2	24,6	21,6
7 És extremadament important	31,8	29,8	31,6	32	32,6	31,8	30,1
NS	0,8	3,2	1,5	0,4	-	1,1	2,1
NC	0,4	-	-	0,5	0,8	-	-
Media	5,38	5,23	5,51	5,36	5,37	5,34	5,47
Desviación	1,56	1,61	1,43	1,58	1,55	1,67	1,4
P23A. Digui'm si us plau, en quina mesura influeixen la opinió i les actuacions dels següents actors en la seva opinió sobre contribuir al software lliure							
1 No influeixen en absolut	13,3	3,6	8,1	15,4	16,4	10,6	10,7
2	7,6	6,4	9,3	7,2	7,2	7	9
3	9,6	16,9	6,1	10	8,2	9,5	12,6
4	16	13,3	22,5	14,5	13,5	20	15,7
5	20,3	33,2	22,2	18,9	16,6	20,5	27,6
6	14,4	10,1	16	14,3	15,4	17,2	8,4
7 Influeixen moltíssim	16,4	16,6	11,1	17,8	20,3	13	13,1
NS	2	-	4,7	1,4	1,5	2	2,9
NC	0,4	-	-	0,5	0,8	-	-
Media	4,34	4,62	4,41	4,31	4,37	4,4	4,21
Desviación	1,96	1,61	1,74	2,03	2,1	1,82	1,81
P23B. Digui'm si us plau, en quina mesura influeixen la opinió i les actuacions dels següents actors en la seva opinió sobre contribuir al software lliure							
1 No influeixen en absolut	13,1	6,4	6,2	15,4	14,6	12,6	10,7
2	7,2	3,6	14,2	5,7	6,6	11,2	2,9
3	9,3	3,6	6,2	10,5	10,1	7,3	10,5
4	12,9	19,8	14	12,2	8,4	14,7	20,1

5	21,7	33,9	28,4	19,2	22,2	21,6	20,9
6	18	9,7	16,4	18,9	18,7	17,7	16,7
7 Influeixen moltíssim	16,7	23	11,3	17,6	17,8	14,8	16,9
NS	0,6	-	3,2	-	0,7	-	1,3
NC	0,4	-	-	0,5	0,8	-	-
Media	4,45	4,92	4,43	4,42	4,47	4,34	4,57
Desviación	1,96	1,64	1,75	2,02	2,03	1,95	1,82
P23C. Digui'm si us plau, en quina mesura influeixen la opinió i les actuacions dels següents actors en la seva opinió sobre contribuir al software lliure							
1 No influeixen en absolut	13,3	3,6	8,1	15,4	16,4	10,6	10,7
2	7,6	6,4	9,3	7,2	7,2	7	9
3	9,6	16,9	6,1	10	8,2	9,5	12,6
4	16	13,3	22,5	14,5	13,5	20	15,7
5	20,3	33,2	22,2	18,9	16,6	20,5	27,6
6	14,4	10,1	16	14,3	15,4	17,2	8,4
7 Influeixen moltíssim	16,4	16,6	11,1	17,8	20,3	13	13,1
NS	2	-	4,7	1,4	1,5	2	2,9
NC	0,4	-	-	0,5	0,8	-	-
Media	4,34	4,62	4,41	4,31	4,37	4,4	4,21
Desviación	1,96	1,61	1,74	2,03	2,1	1,82	1,81
P23D. Digui'm si us plau, en quina mesura influeixen la opinió i les actuacions dels següents actors en la seva opinió sobre contribuir al software lliure							
1 No influeixen en absolut	13,3	3,6	8,1	15,4	16,4	10,6	10,7
2	7,6	6,4	9,3	7,2	7,2	7	9
3	9,6	16,9	6,1	10	8,2	9,5	12,6
4	16	13,3	22,5	14,5	13,5	20	15,7

5	20,3	33,2	22,2	18,9	16,6	20,5	27,6
6	14,4	10,1	16	14,3	15,4	17,2	8,4
7 Influeixen moltíssim	16,4	16,6	11,1	17,8	20,3	13	13,1
NS	2	-	4,7	1,4	1,5	2	2,9
NC	0,4	-	-	0,5	0,8	-	-
Media	4,34	4,62	4,41	4,31	4,37	4,4	4,21
Desviación	1,96	1,61	1,74	2,03	2,1	1,82	1,81

P24A. Digui'm si us plau, en quina mesura afectarien a la opinió de la seva empresa sobre la contribució al software lliure possibles canvis en la opinió

1 No afectarien en absolut	13,1	10	10,9	13,9	14,1	14,5	9,2
2	6,6	10,1	11	5,2	5,9	6,6	8
3	14,7	10,4	7,9	16,8	17,7	14,3	9,2
4	17,7	10,1	18,9	17,9	14,7	19,4	21,6
5	23,1	36,8	22,5	22,3	23,2	16,2	32,6
6	14,4	12,9	16,1	14,1	11,7	19,7	12,6
7 Afectarien extremadament	8,4	6,5	9,6	8,2	10,3	8,3	4,6
NS	1,5	3,2	3	1	1,6	0,9	2,1
NC	0,4	-	-	0,5	0,8	-	-
Media	4,1	4,22	4,21	4,06	4,06	4,09	4,19
Desviación	1,79	1,71	1,81	1,79	1,84	1,85	1,58

P24B. Digui'm si us plau, en quina mesura afectarien a la opinió de la seva empresa sobre la contribució al software lliure possibles canvis en la opinió

1 No afectarien en absolut	13,2	6,8	7,9	15	16,5	12,1	7,7
2	5,2	3,2	9,5	4,3	4,7	7,2	3,6
3	12,5	17,7	7,9	13,4	14,4	11	10,7
4	18,4	10,1	14,2	20	18,8	15,2	21,8
5	22	19,4	22,1	22,2	17,4	26,1	25,9

6	19,4	26,6	21	18,4	18	19,3	22,2
7 Afectarien extremadament	8,5	12,9	15,9	6,3	9,4	9,1	5,9
NS	0,5	3,2	1,5	-	-	-	2,1
NC	0,4	-	-	0,5	0,8	-	-
Media	4,24	4,69	4,62	4,11	4,08	4,3	4,48
Desviación	1,8	1,73	1,83	1,78	1,89	1,8	1,56

P25A. Què creu vostè que és més fàcil, contribuir a projectes de programari lliure per al desenvolupament d'aplicacions verticals o horitzontals

1 És molt més fàcil contribuir a aplicacions verticals	11,7	19,7	14,1	10,5	11,5	13,8	9,2
2	6,4	17,3	6,2	5,6	5,9	7,7	5,4
3	8,7	3,2	11	8,5	7,9	12,2	5,5
4	11,6	13,7	6,2	12,8	10,5	11,5	13,8
5	12,1	-	12,7	12,9	12,6	8,4	16,2
6	20	9,7	14,7	22,1	23,8	16,6	16,7
7 És molt més fàcil contribuir a aplicacions horitzontals	27,5	33,1	33,4	25,6	25,1	28,5	31,1
NS	1,6	3,2	1,5	1,5	1,6	1,1	2,1
NC	0,4	-	-	0,5	0,8	-	-
Media	4,8	4,22	4,78	4,84	4,83	4,59	5,01
Desviación	2,06	2,45	2,2	1,99	2,03	2,17	1,95

P25B. Creu vostè que és més fàcil contribuir a projectes de programari lliure si el grup de futurs usuaris opúblic objectiu és molt nombròs?

1 La facilitat per contribuir no depèn en absolut del nombre d'usuaris	6,1	10,1	4,7	6,1	5,2	6,8	6,9

2	3,1	7,2	4,9	2,4	3,9	3,1	1,5
3	3,9	3,2	3	4,2	2,5	7,9	1,5
4	6,8	6,9	8	6,5	4,3	6,4	12,6
5	11,7	3,2	11,2	12,4	12,7	11,7	9,6
6	21,5	36,2	12,7	22,8	19,3	22,3	25,1
7 És molt més fàcil contribuir si el públic objectiu és molt nombrós	46	29,9	54	45,1	51,4	41,8	40,6
NS	0,5	3,2	1,5	-	-	-	2,1
NC	0,4	-	-	0,5	0,8	-	-
Media	5,66	5,22	5,74	5,67	5,81	5,47	5,6
Desviación	1,77	2,03	1,79	1,74	1,71	1,85	1,74

P26. ¿Què creu vostè que és més fàcil, contribuir a un projecte de programari lliure amb un nombre elevat departicipants (més de cinc) o a un amb un més ?

1 És molt més fàcil contribuir a un projecte amb un nombre petit de participants	10,5	20,1	9,6	10	11,1	10,5	9,2
2	9,5	13,3	12,3	8,5	6,8	12,6	10,7
3	10,8	6,5	6,2	12,3	9,7	13,7	9,2
4	10,5	16,5	6,6	11	12,3	10,2	6,9
5	11	10,1	9,8	11,3	10,6	10,6	12,3
6	15,2	10,1	16,1	15,3	17	12,2	15,5
7 És molt més fàcil contribuir a un projecte amb un nombre elevat de participants	30,6	20,2	37,8	29,5	30	30,1	32,6
NS	1,6	3,2	1,5	1,5	1,6	-	3,6
NC	0,4	-	-	0,5	0,8	-	-
Media	4,73	3,97	4,97	4,72	4,8	4,55	4,86
Desviación	2,11	2,21	2,17	2,08	2,08	2,14	2,12

P27. La seva empresa té experiència en col·laborar en grans projectes? Considerem un projecte gran si

la facturació o import total és de més de 500.000 euros							
Sí	21,6	19,8	18,7	22,4	13,2	20,4	40,8
No	76,8	80,2	78,1	76,2	85,3	77,6	57,7
No sabe	1,3	-	3,2	0,9	0,7	2	1,5
No contesta	0,4	-	-	0,5	0,8	-	-
P28. En els projectes per a la comunitat de programari lliure en què participen, ho fan com a líders dels mateixos o com a col·laboradors?							
Base:Contribueix en en projectes per a la comunitat	112	4	24	84	47	38	27
1 En tots el projectes en què participen ho fan com a líders	1,8	-	3,6	1,4	2,4	2,3	-
2	4,6	-	4,1	5	4,6	2,7	7,6
3	2,8	-	-	3,8	2,4	2,7	3,8
4	8,4	-	3,6	10,1	9,5	4,9	11,4
5	11	-	11,5	11,3	9,4	10,6	14,1
6	6,3	14,1	4,1	6,6	11,9	-	5,7
7 En tots els projectes en què participen ho fan com a col·laboradors	59,2	85,9	73	54,1	52,4	71,5	53,6
NS	1,9	-	-	2,6	2,4	2,7	-
NC	3,9	-	-	5,1	4,9	2,7	3,8
Media	5,95	6,86	6,2	5,83	5,85	6,22	5,74
Desviación	1,62	0,35	1,59	1,65	1,66	1,53	1,65
P31. En quina mesura afecta l'opinió dels treballadors i col·laboradors de l'empresa a les decisions de la direcció?							
Base:Total	300	16	58	226	140	93	67

1 No afecten en absolut	8,4	6,9	6,6	9	8,2	8,6	8,4
2	5,1	20,1	4,6	4,2	3,2	5,9	8
3	10,6	6,9	9,4	11,1	12,4	9,2	8,4
4	16,4	10,1	17	16,6	14,1	17,5	19,5
5	29,6	23,4	23,9	31,5	31,2	25	32,7
6	16,3	25,8	11,3	16,9	14,2	21,4	13,8
7 Afecten extremadament	12,5	6,8	27,2	9,1	14,2	12,4	9
NC	1,1	-	-	1,5	2,5	-	-
Media	4,54	4,28	4,9	4,47	4,6	4,58	4,38
Desviación	1,7	1,81	1,79	1,65	1,69	1,73	1,65

P29. Els treballadors o col·laboradors de la seva empresa, participen en projectes de programari lliure, ja sigui dins de l'empresa o a nivell particular

1 Cap d'ells hi participa	39,6	57,6	42,7	37,5	45,8	40,5	25,5
2	15,6	6,5	14,7	16,5	14	11,7	24,3
3	11,2	3,2	9,3	12,2	8,8	9,4	18,8
4	7,5	6,5	9,3	7,1	5,6	10,9	6,7
5	10	12,9	8,1	10,3	7,8	11,3	12,8
6	5,7	3,2	6,2	5,7	4,8	6,2	6,7
7 Tots hi participen	5,2	6,9	6,4	4,8	6,7	6,2	0,8
NS	4	3,2	3,2	4,3	4	3,8	4,4
NC	1,1	-	-	1,5	2,5	-	-
Media	2,69	2,46	2,69	2,71	2,54	2,84	2,79
Desviación	1,91	2,05	1,97	1,89	1,98	2	1,63

P30. Digui'm si us plau, quina és l'opinió general dels seus treballadors i col·laboradors respecte el programari lliure ?

1 La majoria no	3,7	3,6	3	3,9	4,5	3,1	2,9

està a favor							
2	5,6	6,9	3	6,2	5,3	5,3	6,7
3	13,4	19,4	15,3	12,5	12,1	15,7	12,9
4	16,1	20,2	11,4	17	15,8	13,5	20,3
5	15,4	10,1	17,6	15,3	16,2	15,4	13,9
6	13,2	17,3	14,2	12,6	10,6	16,7	13,6
7 La majoria està a favor	25,2	19,4	27,8	24,9	29	21,1	22,8
NS	6,3	3,2	7,7	6,1	4	9,2	6,9
NC	1,1	-	-	1,5	2,5	-	-
Media	4,88	4,61	5,07	4,85	4,94	4,84	4,8
Desviación	1,78	1,75	1,72	1,79	1,82	1,73	1,73

P32A. Digui'm si us plau, en quina mesura seria probable que la seva empresa contribuís al software lliure si hi hagués una major disposició dels segün

Base: No contribueixen en projectes per a la comunitat	98	4	16	79	41	31	26
1 Segur que no hi contribuiria	13,2	13,9	17,7	12,2	13,5	9,3	17,3
2	7,8	15,5	12	6,6	6,6	9,3	7,9
3	4,2	-	5,6	4,2	8	2,8	-
4	16,8	-	17,6	17,4	13,5	12,1	27,7
5	26,6	-	17,7	29,6	24,6	28,8	27,2
6	16,6	43,1	12	16,3	17,7	17,4	13,9
7 Segur que hi contribuiria	11,7	27,6	17,6	9,8	16,3	13,7	2
NC	3,1	-	-	3,9	-	6,5	4
Media	4,37	4,96	4,12	4,39	4,47	4,59	3,93
Desviación	1,87	2,27	2,08	1,79	1,94	1,83	1,73

P32B. Digui'm si us plau, en quina mesura seria probable que la seva empresa contribuís al software lliure si hi hagués una major disposició dels segü

1 Segur que no hi contribuiria	18,1	27,6	17,6	17,7	19	20,2	13,9
2	9,6	29,2	12	8,2	12,1	7,7	7,9
3	9,3	-	5,6	10,4	5,2	19,1	4
4	16,1	-	12	17,7	19	9,3	19,8
5	26,8	-	12	31	24,6	19,5	39,1
6	8,5	29,4	11,2	6,9	9,7	8,9	6
7 Segur que hi contribuiria	7,7	13,9	23,9	4,2	10,3	8,9	2
NS	0,9	-	5,7	-	-	-	3,4
NC	3,1	-	-	3,9	-	6,5	4

P32C. Digui'm si us plau, en quina mesura seria probable que la seva empresa contribuís al software lliure si hi hagués una major disposició dels segü

1 Segur que no hi contribuiria	13,8	27,8	6,3	14,6	10,7	16,2	15,9
2	10,1	15,5	12	9,5	12,1	12,6	4
3	16,7	-	22,5	16,4	19,1	21	7,9
4	13,1	-	5,6	15,1	16,6	9,3	11,9
5	21,8	42,9	12,7	22,6	17,3	19,5	31,7
6	10,6	-	11,3	10,9	11,1	9,3	11,3
7 Segur que hi contribuiria	9,9	13,9	23,9	6,9	13,1	5,6	9,9
NS	0,9	-	5,7	-	-	-	3,4
NC	3,1	-	-	3,9	-	6,5	4