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IDENTIFICATION OF BARRIERS AND SOLUTIONS FOR ADOPTION OF SOCIAL, COMPLEMENTARY AND/OR VIRTUAL CURRENCIES

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ABSTRACT

With the advent of social and mobile networks, new online communities are being created around sustainable topics (e.g. environmental, social, community development). The phenomena, known as digital social innovation, generates a positive ecosystem where business and social development enabled with new behaviours boosted by social, complementary or community currencies deployed as virtual currencies have a great potential for competitiveness, and entrepreneurship, but also for fostering social responsibility in Europe. This document summarizes actions carried out through the Vircoin2SME European community project (social, complementary or community virtual currencies transfer of knowledge to SME: a new era for competitiveness and entrepreneurship) for identification of barriers and their possible solutions to reduce them in the context of the adoption of social, complementary and virtual currencies by SMEs and consumers. The Case Study method allowed identifying these barriers almost at all on the basis of RES (digital currency of Belgium) and Eurakos (virtual currency of Girona, Spain) complementary currencies operation by which the Vircoin2SME researchers had close contact. Data analyzed were taken through observation, being the project researchers' direct users of these currencies and, the information records stored in databases concerning the users' interactions (transactions in trades associated with the RES and Eurakos networks). This research was supported by the European Union's Framework Programme for Research and Innovation Horizon 2020 (2014-2020) under the Marie Skłodowska-Curie Grant Agreement No. 654767.

KEYWORDS

Sustainable economy, social innovation, digital currencies, entrepreneurship, RES, Eurakos

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1. INTRODUCTION

Social, Complementary, Community, Local and Crypto currencies using a virtual scheme (from now referred as virtual, complementary currencies or VCC) have been considered as new means of socio-economic development by generating local exchange systems based on the idea of trading with anything different from a legal currency (fiat currency) through electronic means.

In the last thirty years, it is known that more than 4000 complementary currency systems have been developed in more than 50 countries worldwide with a variety of models and application schemes. Unfortunately, due to numerous barriers and constraints – both identified and studied by the VirCoin2SME consortium (Universitat de Girona, Spain; Universidad Autónoma de Bucaramanga, Colombia; EASY Innova Center of Girona; Fraunhofer IDMT Institute, Germany; Admin Leuven bvba, Belgium and Estrategias Sostenibles EKOSOS of Ecuador) – a great percentage of these systems have failed in its attempt to create alternative practices aiming at supporting local economies towards sustainable ecosystems while improving the social interactions among the different stakeholders involved.

At the age of the blockchain disruption and new technological advances in social networking and social money, VCC is looking forward to reaching the highest levels of not only development and innovation but of usability, security, and trust. Nevertheless, prior to meet this big, successful leap, it is necessary to understand and face the barriers for its adoption and replication and explore the possibilities to overcome them and improve its performance while fulfilling with the objectives, features and mechanisms to create long-term business models that boost the socio-economic development within a local, regional or global context.

VirCoin2SME was a multidisciplinary project that involved academic and non-academic organizations to promote collaboration in socio-economic research and transfer of knowledge for developing guidelines that orient the creation of sustainable business models based on the use of complementary and virtual currencies. Finally, the idea is to propose two of these business models to support SMEs of tourism and health sectors not only for Europe but Latin America.

This document presents research results of the Vircoin2SME project towards the identification of barriers for the adoption of complementary and virtual currencies in the context of SMEs and consumers in general. Possible solutions are also contextualized to reduce the aforementioned barriers.

The research was addressed by secondments based on the exchange of knowledge and cooperative collaboration between companies and research organizations involved in the Project. Companies' visitors received in the research organizations, introductory and training activities together with mentored tasks. Visitors from research organization received from companies, knowledge, and information about the relevant regulatory and business variables to feed research, conclusions, and outcomes expected.

In addition to the analysis of the literature related to social, complementary and virtual currencies, the case study in the context of the complementary currencies RES (digital currency of Belgium) and Eurakos (virtual currency of Girona, Spain) was the research method used to achieve the Project outcomes. As it was mentioned before, these currencies were in execution (i.e. RES as a consolidated complementary currency and Eurakos as a prototype of a virtual currency) and their entrepreneurs were part of the consortium of this research.

This document begins with a review of the basic literature needed for the research approach. The identification of barriers for the adoption of social complementary and virtual currencies and possible proposals to reduce these barriers are the subject of sections 3 and 4 respectively and finally, section 5 closes the document with the conclusions.

2. LITERATURE REVIEW

The VirCoin2SME project involved the following dimensions: social digital processes and, social, complementary or community virtual currencies and their interaction with business and economy domains. Description of each of these dimensions is introduced next.

2.1 Social digital processes

This research identifies key points for the incorporation and acceptance of technology by society, in aspects related to new ways of strengthening local economies through the use of social and virtual complementary currencies. Knowing the basis of digital social innovation is essential to achieve it.

Baeck and Bria (2014) claim that many social innovations can be result of four main technological trends which in one way or another favor people and strengthen their collaborative relationships: open hardware, that make digital hardware available for people to adapt, hack and shape into tools for social change; open knowledge, that refers to large groups of citizens coming together through online platforms to collectively analyze data, develop and analyze new types of knowledge or crowdfund social projects; open data, that refers to innovative ways of opening up, capturing, using, analyzing and interpreting open data; and, open networks, that describes how citizens are developing new networks and infrastructures, e.g. sensor networks, where they connect their devices such as phones and internet modems, to collectively share resources and solve problems.

Digital social innovation (DSI) has emerged as a new topic around the turn of the century, triggered by a number of advances in Internet technologies. The shift from a hierarchical society to a networked society has created a culture of dependence on others, channeled by Internet and new ICT applications.

2.2 Social, complementary and community currencies

As an alternative to conventional financial and monetary systems which are characterized by their tendency to speculation and hoarding, and to threaten the social relations, have emerged the social systems, which focus on solidarity finance and are linked to the microcredit and microfinance.

The articulation of such systems has given rise to the social economy, which releases the fiat currency of local development and tries to find new solutions to social, economic or environmental problems that have been ignored or inadequately addressed by the public or private sectors. The objective of this economy is not accumulating profits, but generating goods and services through fair productive structures where labor equality, gender equality and respect for the planet have priority (Blondeau et al., 2004).

If solutions are designed to achieve objectives without profit, according to Scott and Green (2013) a social economy has a unique role in the creation of a strong, sustainable, inclusive, prosperous and solidary society.

To operate in a social economy requires a type of currency, a social one, or alternative, that may be local, communitarian, complementary or virtual. HRZONE (2015), among others, have defined social currency as a set of resources and skills created and made available through communities and networks (on line or off line), or the degree with which clients share a brand (as a simple result of the interaction between people) or a brand information or business with others (Vivaldi Partners, 2013). The social participation for knowing or using all types of information (e.g., products, services, habits, history, etc.) is which gives value to this currency.

Generally, the purpose of an alternative currency, is to provide specific services and features which the legal tender currency cannot offer, as for example, ensure that people meet their basic needs, promote active citizenship, strengthen sustainable and environmental behaviors (LANZAROTE, 2013), create civic culture, promoting local trade, creating a society of learning, etc.

According to Lietaer and Belgin (2012), the design of an alternative currency (i.e. local, communitarian or complementary) varies depending on the way how it responds to different origins, principles and requirements, however, Blanc (2011), complements stating that it is more organized and better focused the objective, if that design responds to the philosophy and general purpose of a project that is characterized by its designers. In that sense, proposes three kinds of projects that would constitute the root any kind of currency systems: a territorial project, mainly focused on a geopolitical space; a community project, focused primarily on a pre-existing community or adhoc and an economic project, focused in activities of production and exchange markets.

Complementary currencies are used in the current (but limited) local economic environments and operate under the principle of using them together with the fiat currency, and are intended to stimulate local economic activity by relocating expenses of daily consumption. To ensure successful experiences using this currency there is a need to link small and medium-sized businesses (SME) and also in some cases, the alliance with local governments it is important especially when taxes or local public services can make use of it.

2.3 Complementary currencies representation

A social or complementary currency can have physical representation as tickets, accounting books or bonds, or digital/virtual representation as accumulated points for activities carried out through virtual communities (online business and games, for

example). The use of each of them requires compliance with established rules for the corresponding community that created them.

The European Central Bank defined virtual currency as a type of digital money that works in an unregulated environment issued and controlled by its developers and used as a payment method among members of a specific virtual community (Buntinx, 2015).

The implementation of these systems is not so easy since there are a series of factors that must be articulated to generate successful experiences. Precisely, the objective of the Vircoin2SME project that is presented in this document, is to identify what types of barriers can arise to naturally adopt complementary currency use solutions in any of their representations (tending more towards virtual representations) to strengthen local economies that meet social objectives.

Vivaldi Partners (2012) identifies six types of users' social behaviors as basic to be considered for the implementation of social currencies, these are:

1. Utility, which consists in gain value by interact with brands (or business identifiers) and others.
2. Information, to receive and share with other people valuable information about businesses.
3. Conversation, to talk about a brand or business to others.
4. Promotion, to promote or defend a brand or business.
5. Affiliation, to connect and be a member of a community of people that is linked to a brand or business.

In a smart city context, social currencies could be designed to build social networks, since they not only focus on needs, but help people achieve their goals, improve processes and activities and facilitate decision making (with interaction between they) through products and services or something that really has an impact on their daily life, which is increasingly influenced by the use of technology (for example, education, environment care, mobility, urban development, health, etc.).

The users' loyalty in social currency systems has been one of the factors that most influences the success of the implementation of social currencies, especially because it is a matter which depends on the design of the interaction environments considering the users' behaviors mentioned by Vivaldi. Customer loyalty is both an attitudinal and behavioral tendency to favor one brand over all others and to recommend it to other customers. Berger (2013), says in that sense, people recommend and share with others the things that to them has made them feel good (for example, good service, good value, excellent quality/price, fast delivery, etc.) and accurates to take into account the following elements to be incorporated in social business systems:

1. Identify the most important or the distinguishing seal of product or service offer and put it always visible (if it is in a virtual social network interface, use a central box in front to the user).
2. Use games mechanics, to encourage clients to engage in certain actions for the goals' achievement. This allows knowing how is the customer's performance with respect to others, which encourages the spirit of competitiveness and internally motivates to be better than others.
3. Make customers feel exclusive. In that sense, Cialdini (2006) claims that if there is less existence of a product or less service availability, more will be desired by customers. If a thing is rare and little common, most people want it, then they will share with others the brand and may be this will attract new customers.

VirCoin2SME aims at participating in the new generations of currency schemes that should emerge in the coming years and decades, either through the spreading of already existing schemes or through new combination of existing schemes or eventually through critical innovations like the "free currencies" or virtual currencies attempts that emerge as a full generation of new currencies. The future evolution of Complementary Currencies (CC) is certainly linked to technological progress (with the use of Internet and mobile devices), to their acknowledgment as a key element of public policies, and to their use as a tool for environmental solutions.

2.4 The RES complementary currency

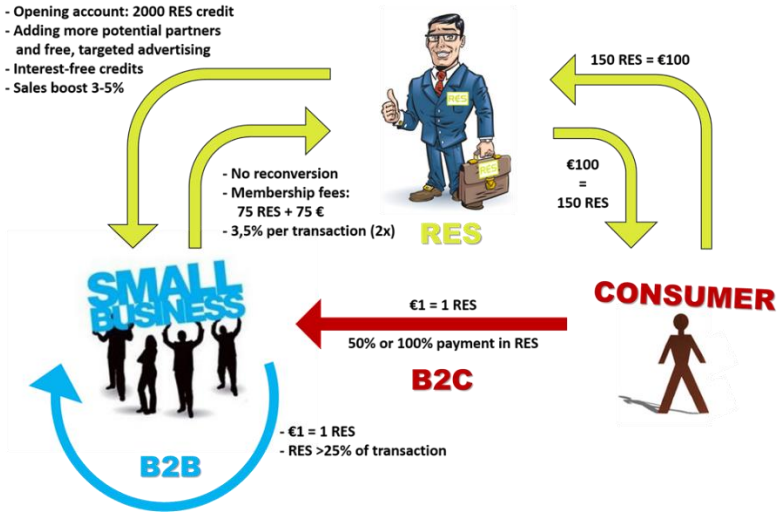
Leuven – Belgium is the home of RES, where Admin Leuven was created in 1996 as a cooperative network of 5,000 local merchants, SMEs, sole traders and professionals using RES business concept (see Figure 1 Deliverable 3-2:Commercial and Business Aspects, Vircoin2SME Project) to support local traders and SMEs. It operates in the similar way like the Swiss WIR as a centralized organization with strong influence by the participants.

It is a digital currency that works in a complementary way to the Euro. Its main objective is to generate additional revenue (3 to 5%) through exchange among its members, even getting additional customers that would otherwise never have met; including interest-free loans to finance investments. The cooperative has members from all sectors, ranging from bricks, office supplies, printers, catering to lingerie.

The aim of RES is to provide tools to boost local economies via SMEs and freelancers. For that reason, large companies, national governmental organizations and multinationals are excluded from participating within the network.

Initially, RES was operated as SME-instrument only, but since 2008, the company added consumer prepaid cards to create more vivid exchange in the RES network. Since 2012, the company extended its activities towards Catalonia – Spain, focusing in Girona.

Figure 1. Process of operation of the RES complementary currency (Deliverable 3-2: Commercial and Business Aspects, Vircoin2SME Project)



2.5 The Eurakos complementary currency (€)

It is a novel virtual currency aiming to enhance the producers and consumers online negotiations by a global and local platform, whereas the users (consumers) will decide the amount of money they will exchange in advance (Euros to Eurakos) to buy goods and/or services in a specific period of time (preferable more than 6 months) through an auction scheme, and the platform will search for different possibilities offered by the merchants in the network.

The customer will decide the most convenient option (considering quality, quantity and discounts offered during the apportioned time), ensuring at the same time fixed incomes and loyalty opportunities to SMEs/members.

Eurako´s platform launched his first pilot in the region of Catalonia (Spain) in September, 2015. The number of members on the platform reached 50.

The summary of its operation is depicted in Figure 2 (Carrillo, Peña and De la Rosa, 2016) and it is described as follows:

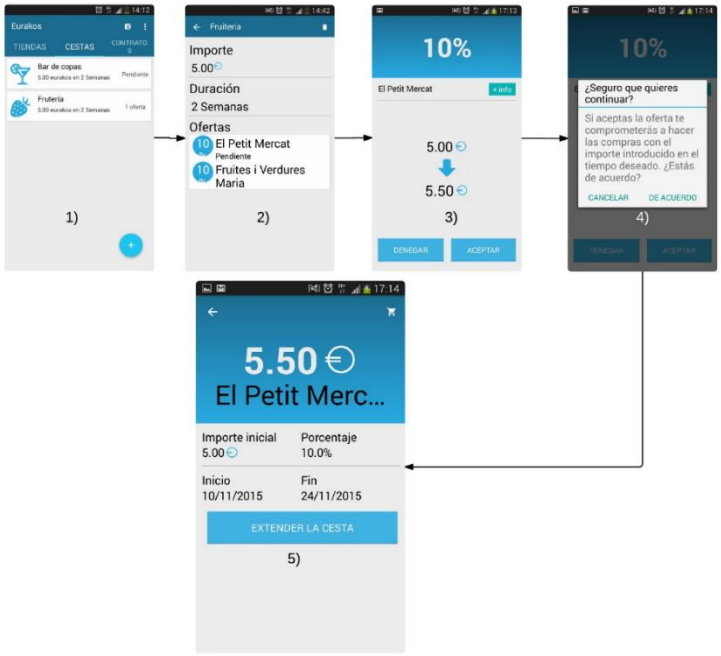
1. The consumer should buy Eurakos with Euros (1€ = 1 €) to start trading.
2. The consumer creates a basket with the types of products, the amount of money to spend on each of them according to his/her needs and the deadline for making the purchase (see Figure 2-(1) which shows 2 baskets for the categories "Bar de copas" and "fruteria" respectively).
3. Providers of the neighborhood sector receive a notification with the information produced in 2., and then as if it was an auction, the different offerings are selected trying to match the consumer preferences.
4. Providers set their offers with discounts they can give for the amount of money established by the consumer (see Figure 2-(2) which shows offers set for the “fruteria” category with 10% discounts – this means 10% more Eurakos).
5. The consumer chooses the only offer he/she thinks fits with his/her interests, i.e., price, location, quality, etc., note in Figure 2-(3), the selection of the "petit mercat" offer. In this case the consumer decided to spend 5€ at the "petit

mercat" but as this business had offered 10% more money for his/her purchases (0.50 more €), actually he/she has 5.50€ to spend in this market.

6. The consumer accepts the offer and then the contract is set (see in Figure 2-(4) the possibility of the offer acceptance and in Figure 2-(5) the established contract with the "Petit mercat" merchant).

7. The consumer can meet the contract within the established dates (i.e., from 10/11/2015 until 24/11/2015), this means that he/she can transact on this agreement until this is met by the deadline.

Figure 2. Process of creating a Eurakos digital contract (Carrillo, Peña and De la Rosa, 2016)



3. RESULTS

This section focuses on the identification of barriers for adoption of social, complementary and virtual currencies from the point of view of Administrators, SMEs and Consumers based on the research carried out by the Vircoin2SME partners.

The experience in the use of RES in Belgium and Girona, and Eurakos in Girona by each one of the employees or researchers assigned to the Vircoin2SME Project who had the opportunity to join the system, allowed to corroborate the theory with the practice in real time.

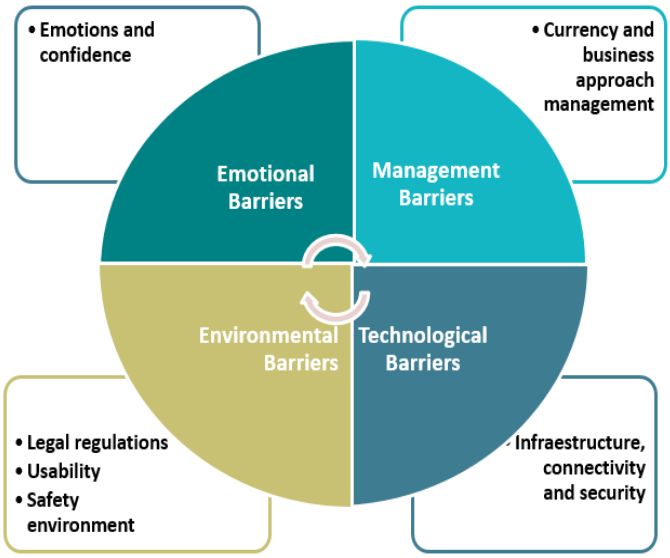
People involved acquired the RES customer card or a Eurakos account and then used it in the different establishments belonging to the corresponding complementary currency system in order to find the strengths and / or barriers that could be presented in the operation of them.

Additionally, the different users of the system (administrators, SMEs and consumers) were asked about their opinions on the factors involved in the use of virtual complementary currencies from the emotional, environmental, technological and management point of view according to their context.

The identification of prominent barriers for an appropriate application of schemes of virtual, social complementary currency systems including those that do not have a direct monetary dimension is a challenge. It usually bases on technical aspects deriving conclusions on the non-technical ones afterwards. Nonetheless, there are many considerations that can be done having a generic technology in mind without digging too much into the specific application domain.

Next figure summarizes the categorization of these barriers considered by the Vircoin2SME researchers.

Figure 3. Classification of barriers for adoption of complementary and/or virtual currencies



3.1 Description of the Emotional barriers

What happens when the two domains of Human-Currency-Interaction design and Money start intersecting? The study of Wang and Mainwaring (2008) shows that in this particular case and context, implications to the design and development of applications, gamification aspects, motivation instruments, and mainly usefulness and usability criteria matter.

The way and the methodologies on how a virtual or a social complementary currency is perceived, obtained, and spent can critically shape users' behavior and experience in using an application.

Virtual and real currencies can correlate in complex ways that promote, extend, and/or interfere with the value and character of the world of gamified elements and applications. Bringing real money into Human-Currency-Interaction design may heighten existing issues of realness, trust, and fairness, and thus presents new challenges and opportunities for user experience innovation.

On the other hand, applications aiming at raising or enhancing the motivation to use a virtual currency application even without a monetary advantage but an appreciation to trigger the application of non-monetary methodologies and approaches allowing the users for making their own choice.

In the following, relevant psychological and emotional factors towards virtual currency will be introduced allowing for an analysis of success and failure characteristics of existing and emerging applications and schemes. The analysis starts with an overview of a few results of a study about virtual team building as well as the respectively identified barriers and hurdles in this part of the business.

The advent of the new century or millennium has shown new trends to human beings, applications, systems, and mainly the way people interact. Human beings used to live in groups right from the beginning, not as single persons. So working in groups, exchanging knowledge, exchanging goods, and learning from each other's work and results is basic to the process of becoming what is called the Homo sapiens. As things have changed toward a digitalization of the society, the new century observes new tendencies in organizations and management trying to accommodate people and processes to the changing global environment.

A team or group of people, who virtually work together, can be described as a Virtual Team. It may simply be considered people who work together, joining forces, on a common task and cross boundaries of space, time, organizations and culture, supported by ICT tools and networks. Such groups and teams offer a range of possibilities; however, their functioning is not always fruitful or even possible. A set of barriers has been identified, and adoptable solutions have been described, complemented by a conclusion about the possibilities and limits of the virtual work.

Barriers for virtual cooperative work, appear especially in the asynchronous systems like messaging, eHealth, eBusiness, eGovernment, etc. The communication quality is lower because the non-verbal cues are limited - a person communicating does not see the other person, missing other person's body language -. However, it can observe meanwhile some attempts to ex-

press one using substitutes of emotions (emoticons). Logically, problems with context-awareness and shared understanding appear.

The communication may become more task-oriented and seems more business-like. It seems easier to forget about the social relations and focus only on the task. Another potential problem is the lack of the virtual group or team members' attributes for tele-cooperative work, such as self-management and intercultural skills, interpersonal trust, skills to use new technologies and to network virtually with others.

The science of knowledge in our view contains at least two general categories, the media impact and the media usage. The media impact describes what media do with human beings, in a physical, mental, or psychological sense. The second category is the media usage. It addresses the question of what human beings do with media, how they apply media.

In the context of the media impact, Vircoin2SME researchers consider intended and unintended results or consequences. The category of the expected and intended impact factors contains competences, knowledge, experience, skills, etc., whereas the other category is related to the expected but unintended impact factors, like aggression, addictiveness, etc.

A typical example for the latter might be the fact of the mental overload and mental underload. Here, tasks allocated to a particular person either do not require the necessary level of attention, or they exceed this level. The consequence is the same in both occasions - the person does not feel appreciation - underload creates a feeling of laziness whereas overload creates the feeling of too much pressure. Both end in a non-acceptance of the tasks to fulfil, in our context the application of a virtual, social, complementary currency approach to the business case expected.

Summarizing the science of media usage and impact explanations, there are a few statements being given in the following that each and every single developer, designer and programmer of applications in the digital world, including the VirCoin2SME aspects, needs to seriously take into account:

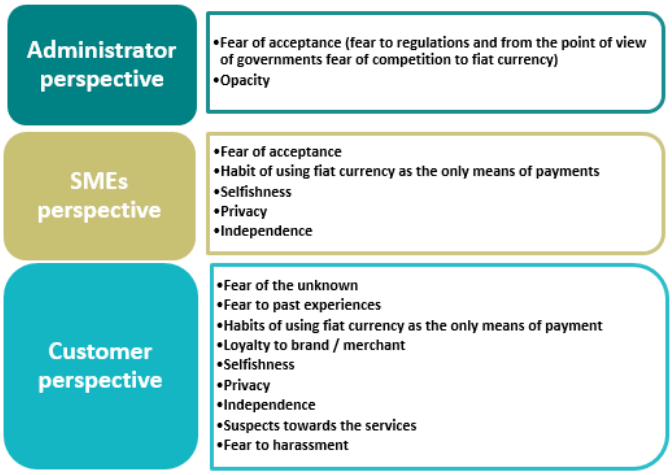
- Human beings usually have expectations to media content even if sometimes these expectations are not clearly expressible.
- Human beings do choose and select media content according to their own (direct or indirect) needs and wishes.
- While using media, a kind of balancing takes place whether the primary, initial expectation (gratification) or at least a secondary expectation (gratification) has been met.
- The level of confidence, trust, and trustworthiness strongly influences and regulates the period as well as the frequency of media usage.
- The reception of media leads to various behavioral changes in human beings in a way that they tend to accept new gratifications and incentives but need to be convinced.
- Human beings do select media content actively – media content has thus a high impact on human beings' behavior.

One of the most important, most relevant categories for evaluating the success of an application in terms of acceptance is the pair of usability and usefulness, complemented by the user experience that starts before the evaluation as such, and does not end after it but adds user comments, gratification aspects, and more.

Usability is defined on the one hand as the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use. Application, system usability, and usefulness are interdependent properties of application and system interaction, which in combination, determine system satisfaction and usage.

Next figure summarizes the emotional barriers identified.

Figure 4. Emotional barriers from the point of view of administrators, SMEs and Customers

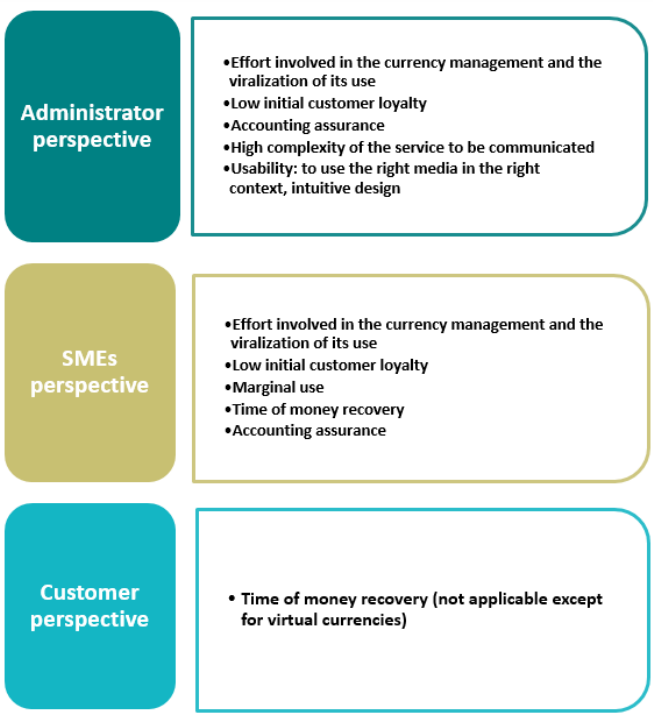


3.2 Description of the Management barriers

Three common barriers for SMEs and currency Administrators were identified during this analysis. Two of them are related to customer´s loyalty within the ecosystem of each complementary currency and the currency management itself and the third one is linked to the accounting assurance in terms of records, financial reports and taxation processes (in compliance to standards and current regulations).

Next figure summarizes these barriers.

Figure 5. Management barriers identified from the administrators, SMEs and Customer perspectives



Effort involved in the currency management and the viralization of its use: it is certainly one of the most important barriers for these and all type of CC systems, due to the fact that maintenance and viralization are both clear indicators in terms of trust and satisfaction perceived by the members (SMEs) and users (Customers).

These keywords "Trust and Satisfaction" are definitely part of the backbone of each CC System (especially when starting to implement a new virtual and complementary currency) and should be analyzed not only in terms of the emotional barriers as described in the previous paragraphs, but also when this new CC System starts in a community or local network, both the knowledge of the operations/services and the commitment to comply the game rules are responsibilities of the Administrator/Platform Manager as well as each SME joining the network.

Therefore the CC System would be able to create and build a respected reputation that will encourage the incorporation of many other new players (SMEs, consumers and other members).

Low initial customer´s loyalty: this boundary is mainly presented during the initial years of launching a new ecosystem/network and it is a definitely crucial issue that could define the success or failure depending on the strategies adopted to spread and bid the values and mission of the new CC system in such a way that both members previous to the starting as well as customers during the first years of implementation are encouraged and committed to make it work.

Accounting assurance: there are intrinsic boundaries that most of all CC systems have to deal with in order to ensure their appropriate training and control activities to guarantee the non-existence of possible irregularities and controversies regarding the compliance on current regulations in terms of accounting and taxation processes of the CC System itself as well as the behavior of the members within the community or social network.

High complexity of the service to be communicated: some informal interviews and observation activities were performed during the researchers' secondments in Catalonia. The perspective that most of the SMEs contacted had about the complexity of how each CC system works (RES.cat / Eurakos) was very skeptical and only a few members were satisfied about the way of understanding and transmitting the game rules to other members and their customers. This small group included the members that had the highest number of transactions within the complementary currency ecosystem.

Usability - to use the right media in the right context: a barrier that sometimes social, complementary and virtual currencies deal with is related to finding the appropriate media to achieve its mission and objectives. For instance, the great technological advances make researchers believe that there will not be other choice than being "online" all time in a near future in most places around the world, and in fact that is accurate; however, the current situation is still in progress specially for developing and emerging countries and even some areas of developed countries where people are not able or attached to virtuality.

Usability - intuitive design: day by day is evident the diversity in technology and new channels of information. For CC systems is not a different scenario, because the eyes of some members, consumers and other players of each ecosystem are getting also focused in understanding how intuitive and novel it could be to use directly social, virtual and complementary currencies through online accounts, apps, and other possibilities.

Marginal use: numbers speak by themselves and not even amounting RES.cat and Eurakos transactions (in Euros) reach less than 0,01% of the GDP in Catalonia. This figure just graphically displays a marginal situation for these CC systems so far, which could be defined as a barrier in terms of the scope and relative importance in economic magnitude. It is of course is not the case of RES.be.

Time of money recovery: this barrier is basically defined as constraints involved when a customer or member wants to redeem a social/complementary currency to fiat currency. For example, when people have an urgent necessity of liquidity for acceding to a good or service "need" that could not be meet within the ecosystem of the CC. This barrier is specially involved to some cases where customers or even members need to find a way to recover fiat money by paying fees (as mean of penalties) but also are conditioned to wait for instances a couple days until the system credit their accounts or transfers the redeemed money.

3.3 Barriers with regard the environment where complementary currencies operate

Apart from the generic barriers that exist for each and every single product, system, application, or service, each implementation project concerning CCs identifies its own additional, sometimes more detailed barriers.

In the context of the Vircoin2SME Project that collected information by surveys applied to the CCs stakeholders or by observation, the following results were found with respect the existence of environmental barriers for adoption of CCs and VCCs:

1. In the domain of SMEs, the barriers tackle mostly the comparably low technology and investment levels available. These issues seen contain the lack of existing standards on the one hand and the high costs of produc-

tion/establishment on the other. Moreover, SMEs stated not to have enough resources for financing, training and using the appropriate technology. The analyzed communities of SMEs consider as the main barrier not having a sufficient level of experience with the development scheme of social, complementary and virtual currencies, as well as the ignorance of the jurisdictional scope for legal purposes. They also claim to have difficulties of integration with the communities due to the different existing ideologies in terms of political, social and cultural backgrounds and, finally, they think that the inability to trade and exchange the virtual currency with the one of legal tender is another important barrier that it must be taken into account.

2. At the governmental level of the regions and countries of the participants in the Project, it was interesting to identify the fear that is felt by the establishment of decentralized structures of autonomous government for the purpose of cooperation in terms of complementary virtual and social currencies, especially for the non-existence of policies and strategies to control the development, implementation and permanence in the market of this type of currency.

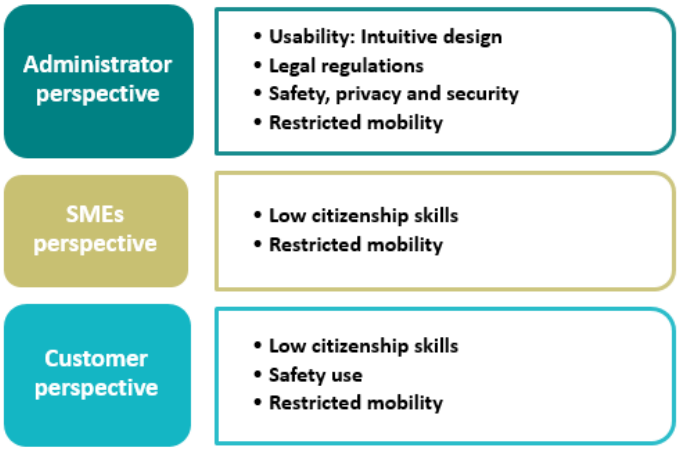
3. The financial institutions involved in this type of projects showed their concern in aspects related to the regulation that applies only to legal tender and not to any other currency, especially virtual currencies. Therefore, the lack of policies and strategies to create and successfully execute a virtual system of complementary social currency is considered a barrier due to the risk of generating political or economic crises that have repercussions on the instability of regions and countries.

4. When interviewing tourists they comment that the main barrier they identify is the inability to change this currency to legal currency at the time they wish and also using a CC scheme would not be possible to bargain in shops.

In short, the Vircoin2SME project did not encounter so many different barriers concerning the environment where the social complementary and virtual currencies operate. In general, the most important thing to mention is the absence of a legal and political framework for the operation of this type of currencies as well as the lack of experience of administrators and SMEs in the design and use of them. Also, the effort involved by the managers of these currencies in training and accompaniment in the follow-up of their operation is a limitation for the adoption of these initiatives in business.

Next Figure summarizes the above mentioned barriers.

Figure 6. Environmental barriers identified from the administrators, SMEs and Customer perspectives



3.4 Barriers with regard infrastructure and technology

It is important to note that the apparent barriers in this classification are those related to connectivity, not only in terms of deficient technological infrastructure (if any), especially in some regions of developing countries, but also in the high cost of the devices (computers , laptops, mobile phones, etc.) used to access the services offered by virtual currency networks, which means that the development of businesses mediated by virtual currencies can only echo in part of the population, that is, they are solutions mutually exclusive from the social point of view.

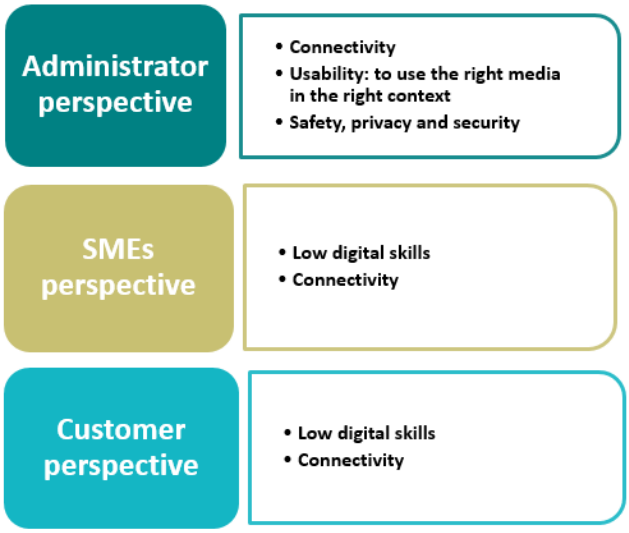
On the other hand still exists a gap in digital skills at different levels of the system's stakeholders which do not allow to exploit the available technological resources efficiently.

Many actions undertaken by Governments for the development of these skills are included in education Programs at different levels, however, it is important to involve people in learning by doing activities on this subject in order to make faster its appropriation.

At this point, of course, there exist the barriers identified in section 3.2 related to the currency usability as to use the right media in the right context and to use intuitive designs (problems that should be addressed by the currency designers considering the context of the stakeholders).

Next Figure summarizes the classification of these barriers.

Figure 7. Technological barriers identified from the administrators, SMEs and Customer perspectives



4. RECOMMENDATIONS ON HOW TO OVERCOME THE IDENTIFIED BARRIERS

As Rogers (2011) stated: "If we want to improve sustainability rate of community currencies, we need to raise skill levels both for the designing and participating in them", these possible solutions should motivate all players throughout better ways for both the transference of knowledge and effective education towards a better understanding of the game rules for each business model application (e.g. through different events, workshops, newsletters and other events gathering different stakeholders and users).

Regarding users' motivation or loyalty, there is still a lot of work to do in order to find the ways to reach a bigger impact when using VCC or CC and, perhaps, the new technological advances are the key to make of this big leap a reality. That is why the creation of promotion and strong marketing strategies should be applied in parallel with new game mechanics aiming to engage and create sense of ownership/engagement in the different members not only to use the CC system but also to spread the word mouth to mouth with family members, friends and colleagues.

When it comes to Latin American – but not limited to European – CC systems, a possible recommendation would be the creation and dissemination of practical guidelines/ tutorials for members. By doing so, they are allowed firstly to obtain a common understanding frameworks for the accounting treatment they will use for recording all transactions (including those using the CC), as well as day-by-day tool to get insights of possible changes in regulations, standards and any other issues that could impact the accounting, finance or taxation processes of these different SMEs within the CC System.

With respect the usability barrier for the complementary currency – in terms of use the right media in the right context – should continue operating based on different schemes of presentation such as prepaid cards, note bills, coins and other mechanisms that would be safely sheltered and backed according the nature of the CC system and will evolve in concordance to the local area context.

For example, in RES.Be Walter Smets (RES Bartering System founder) mentions that mobile payment is not in the focus at the current moment (according his study and understanding the local market in Leuven, Belgium). "It is too novel technology, the

acceptance is low and the users would need some training to learn how to use it which would be too much investment, sooner or later this technology will be included too, as soon as the crowd accept it and can use it already", he states.

Concerning Social inclusion solutions in contexts where citizen skills are low or have not developed in population it is mandatory to design strategies through formal and not formal learning (lifelong learning) as it is consigned in the Paris Declaration on promoting citizenship and the common values of freedom, tolerance and non-discrimination, which in 2015 was adopted by European Education Ministers but extended also to development countries, for instance, Colombia and Ecuador in Latin America.

This Declaration calls for the mobilization of the education sector to promote inclusion and fundamental values. It establishes a list of concrete objectives to be pursued at national and local level and defines four overarching priorities for cooperation at EU-level:

1. Ensuring young people acquire social, civic and intercultural competences, by promoting democratic values and fundamental rights, social inclusion and non-discrimination, as well as active citizenship.

2. Enhancing critical thinking and media literacy, particularly in the use of the Internet and social media, so as to develop resistance to discrimination and indoctrination.

3. Fostering the education of disadvantaged children and young people, by ensuring that the education and training systems address their needs.

4. Promoting intercultural dialogue through all forms of learning in cooperation with other relevant policies and stakeholders. These initiatives can be implemented using learning by doing strategies in daily live where community should work together to achieve objectives. It will create the necessary social weaving to involve people to take advantage of the ICT in daily live to improve the quality of life in economics, environmental and governance aspects.

With respect the implementation of the business models designed by the Vircoin2SME project to support SMEs of tourism and health sectors of Latin-America, this study considers that a good starting point could be the creation of barter networks and time banks and be aware of the development of citizen and digital skills in the population in order to introduce the use of virtual currencies.

As it was mentioned before, one of the technological barriers found to be reduced is the Usability of the applications involved to use virtual currencies. The solution by one hand could be oriented to the design of the user's interface that should follow the Gestalt laws (intuitive design) (Shimpeno & Ezer, 2014) and the KISS principle (simple design) and by the other hand to the use of strategies that clearly show benefits to the currency stakeholders to manage secure, faster and frictionless transactions.

With respect to improving the connectivity strategies that is matter of the country's governments, the Academy can contribute knowledge participating in projects' realization of strategic plans of incorporation of ICT in regions to guide decision making on aspects with the dimensioning of the connectivity infrastructure required according to the context.

See in tables 1 to 4 the main recommendations proposed by the Vircoin2SME project in order to overcome the identified barriers for adoption of social complementary and virtual currencies in business.

Table 1. Recommendations to reduce the Emotional barriers

Recommendations to overcome the Emotional barriers	**1**. Design modules to show stakeholders (merchants and customers) the right way of using fiat and CC, understanding the game rules in terms of managing the business model
	2. Produce knowledge in terms of the basic principle of Complementary Currency getting people to try it out (learning by doing)
	3. Understand the mission of using the Complementary Currency
	4. Promote respect for the brand
	5. Encourage the strategic use of CC applying game mechanics to engage and motivate members to be in the network – loyalty
	6. Design specific marketing strategies in direction of opinion leaders and customer feedback

Table 2. Recommendations to reduce the Management barriers

Recommendations to overcome the Management barriers	**1**. Design modules to show stakeholders (merchants and customers) the right way of using fiat and CC understanding the game rules in terms of managing the business model
	2. Promote the strategic use of CC applying game mechanics to engage and motivate members to be on the network – loyalty
	3. Encourage the use of cryptocurrencies (to reduce the time of money recovery)
	4. Find and communicate rational arguments for the benefits of the use of CC
	5. Find customer feedback analogies of currency generation based on compensation of efforts - didactic strategy

Table 3. Recommendations to reduce the Technological barriers

Recommendations to overcome the Technological barriers	Evaluate properly the Apps design considering the **Gestalt** laws and the **KISS** principle (VC)
	Improve connectivity strategies (VC, CL)

Table 4. Recommendations to reduce the Environmental barriers

Recommendations to overcome the Environmental barriers	Implement social inclusion strategies (CL)
	Begin using social local currency solutions (barter networks and time banks – for CL)

5. CONCLUSIONS

The study of the different existing models of social and complementary currencies and their operating characteristics had made it possible to identify the potential barriers to their adoption in the required contexts of this research, in order to propose solutions that reduce for the experience to be successful in competitive environments and entrepreneurship.

Roughly, these barriers were identified taking into account the types of involved users (administrators of the currency, SMEs and consumers) and the types of actual barriers that include aspects related to trust and human emotions, management and infrastructure and environment.

A common denominator, most notable in Latin America but even in Europe, was related to the barriers of trust and human emotions that lead to the absence of civic culture (learning to live together and work collaboratively to achieve a common good, public safety, respect for the other, etc.) and low digital skills.

In addition, in the dimension of the currency management, still costs in commissions are a bit high (but still lower than the managed by the banks), which has curbed most users to networks linking.

Similarly, the demand for human resource for the accompaniment and the monitoring of the interactions of users with the currencies that will allow a more personalized service, is quite high and therefore the staff costs for the managers of the currency has been increasing, for which it sees that the solutions must be oriented toward the development of competencies in the citizens (SMEs or independent users) and to the proper exploitation of the technology generating innovative solutions attractive, intuitive and easy to use to motivate the linking of users to networks and their permanence in the same.

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