Civic Innovation as a Response to Social Problems.
The case of Civic and Public Challenges in Mexico

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ABSTRACT

In this paper, the Civic Challenges and Public Challenges initiatives developed in Mexico, as an innovation experience on the implementation of technological strategies for the solution of social problems, are described.

We will reflect on the concept of civic innovation as a response and conceptual framing for the challenges and opportunities that the technological development and changes may offer in order to solve to social problems.

We offer a summary on the role that the *Codeando Mexico* civic organization has had as a leader organization that promotes and catalyzes civic innovation by means of the Civic Hacking movement, as well as by developing Civic Communities in Mexico and Latin America.

Last, we analyze the impact that the citizen participation -by means of the civic appropriation of thechology and where the empowerment of the citizens has an increasingly and more determinant role and presence- has on the conformation of a new technological ecosystem.

CCS Concepts

H.5.3 [**Group and Organization Interfaces**]: Computer-supported cooperative work.

Keywords

Civic innovation, civic technologies, civic hacking, social innovation, civic engagement, citizen participation, civil society organizations, Codeando México.

1. CIVIC INNOVATION

The concept *innovation* (innovación) is defined by the Real Academia Española[1] as "the action of altering or changing by introducing novelties"[2] [1]; Arenilla Sáez and García Vegas shed light on the concept by referring it to "products and processes that introduce significant improvements in the way in which problems are solved or things are made"[3] [2]; Domenco Di Siena would also add that the words change and opportunity could be considered as synonyms of innovation as well[4].

The previous definitions show that in order for something to be considered an innovation, it must 1) be new, although not necessarily original and 2) generate an improvement that could be translated both into a satisfactory result that would demonstrate efficiency, as well as into an achievable alternative to the already existing solutions. Phills (et al.) suggests two more criterions to the ones mentioned above: it has to be sustainable, fair and it should be able to generate value [3].

On the other hand, the concept *civic* makes reference to the sense of "belonging to the city or to the citizens"[5] and is "related to civility"[6] [4]; the term *civismo* (civility) makes reference to "the respectful behavior of a citizen regarding the rules of public cohabitation"[7] and to the "enthusiasm for the institutions and interests of the mother country"[8] [5]. We could summarize the four elements that make the concept of civic up as: *the citizen interest to follow the institutions within a frame of social development, of the acknowledgement of the citizens' rights and obligations, and for the improvement of the social cohabitation of a community*.

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[1] *RAE*- Official institution responsible for overseeing the Spanish language.

[2] my translation- Every quote of this source has been translated by me.

[3] my translation.

[4] Civic innovation and civic design – Domenico di Siena. http://www.laciudadviva.org/blogs/?p=28609

[5] my translation.

[6] my translation.

[7] my translation.

[8] my translation.

Thus, associating these two concepts in their most basic sense, we would have the following definition for civic innovation: *it is the research and development of new solutions, ones that are the most efficient, effective and sustainable or that just show to solve the problems related to the city and the citizens better, compared to the ones that already exist.*

1.1 The ICTs: mechanisms of civic innovation

The emergence of the ICTs has transformed the current and future surroundings and models of development and coexistence in all of its fields. The adoption and integration that they have in more or less extent had, as well as the positive or negative impact that they have been able to generate, is based on their role as binding agents, ones capable of generating products and processes that can be attributed to actions and results of innovation.

Therefore, when technology is increasingly adapted, integrated and used on the everyday processes of societies and of citizen practice and development, it becomes a mean, a resource and a tool, and these three elements can always be innovated by civic means.

At this point, civic innovation can be defined as: the search and development of new solutions, ones that are more efficient, effective and sustainable, and that, supported by a technological base, are oriented to the resolution of social and citizen problems and show an improvement compared to the existing social and citizen conditions and processes.

2. CODEANDO MÉXICO

The reference that is made in this text to *Codeando México*, is due to the work and transcendence that the achievements of this civic organization have had ever since they appeared by the end of the year 2012.

Codeando México was defined from their beginnings as a "team of software programmers and designers who had the initiative to start making civic hacking"[9] that is, to develop technology of social impact (civic technology) "to help solve the problems that needed most attention in the country"[10].

It was under this vision that they were given an honorable mention at the regional Developing Latin America 2012[11] Hackathon regarding their Civic Platform proposal, which consisted in a space of permanent hackathon in which "civic foundations or members of the civic society can publish projects that display open data as well as involve those who are interested in the areas of technology, design or industries overall, in developing a technological solution"[12] [6] and in which the "transparency and collaboration happen on everyday basis" based on the "interaction between civic society organizations and the technological community in order to suggest solutions for civic matters"[13] [7].

[9] *Codeando México*: Civic Hacking. https://medium.com/re-magazine/codeando-mexico-hacking-civico-47010bc4da7a#.z7ql7x3j7

[10] Towards a new *Codeando México*. http://blog.codeandomexico.org/2015/11/25/hacia-un-nuevo-codeando-mexico/

[11] Developing Latin America. https://www.youtube.com/watch?v=iNJ99SLRtVQ

[12] my translation.

[13] my translation.

2.1 The *#App115* y the *#SATMóvil* Challenge

Based on this simple yet powerful definition of their objectives and project as a civic organization, *Codeando México* bursted into the national political scenery in March 2013. After finding out - due to a journalistic research[14]- of the tender approved by the Chamber of Deputies –corresponding to the LXII legislation of the *Congreso de la Union*- for purchasing a mobile application in 115 million pesos, which would monitor de legislative activity of the deputies, *Codeando México* publically questioned the price of the application since, according to the opinion of several specialists of the software industry, it shouldn't be over the 500 thousand pesos[15].

This journalistic research was opened to everyone and discussed in the social networks as the *#App115*. It ended up becoming a petition at Change.org, aimed at the Chamber of Deputies so the purchase of the app could be stopped. More than 1,946 signatures backed up the petition and its goal was achieved just a few days after it was launched, since the contract for the purchasing of the app ended up being cancelled[16].

Along this research and the citizens' petition to stop the purchase, the questioning of *Codeando México* was translated into a calling for the community of hackers and software developers to build an open source application that would respond to all the specifications provided by the Chamber of Deputies[17] for their app. The calling was launched under the name of *Derrocando a la Mexican Tech Mafia* (Overthrowing the Mexican Tech Mafia)[18] and more than 150 participants were interested. They developed 5 open source apps, along with 3 web applications for data delivery, and the construction of an API that included data of the congress men, all of which were presented to a party of the Chamber of Deputies. It all happened in just ten days.

This is how *Codeando México* launched its first challenge for open participation and for the development of technology that would help solve public interest issues and governmental observance. It all thus initiated a movement based in civic hacking and civic innovation, a movement that shapes and develops a young and emerging community that is convinced of their alternative of change as a mean for citizen participation and empowerment.

The impact that the *#App115* challenge had, called the attention of some areas of the federal government and a first challenge worked out together by both *Codeando México* and a federal agency, the

[14] The Chamber of Deputies buys a 115 million *pesos* app. http://www.adnpolitico.com/congreso/2013/03/13/la-camara-de-diputados-compra-app-en-115-millones-de-pesos

[15] 115 millions for an application or the need of useful web services in Mexico. http://es.gizmodo.com/app115-los-costos-de-una-aplicacion-y-la-necesidad-de-468847399

[16] *Pulso Legislativo's* cancellation of a 115 million *pesos* contract for an app for the deputies. https://www.change.org/p/c%C3%A1mara-de-diputados-m%C3%A9xico-cancelaci%C3%B3n-contrato-a-pulso-legislativo-por-app-de-115mdp-para-diputados

[17] The 115 million *pesos* app. https://codeandomexico.org/proyectos/21

[18] *Derrocando* a la Mexican Tech Mafia. http://web.archive.org/web/20130811121538/http://blog.codeandomexico.org/post/45466651453/derrocando-a-la-mexican-tech-mafia

SAT (*Servicio de Administración Tributaria*, the Mexican IRS), was developed. This challenge was named *#RetoSATMóvil* (mobile SAT challenge)[19], it invited everyone to redesign de mobile app of this federal institution and the winner would be given a contract to develop the project. With this second challenge, a solid first step was given in the institutionalization of a new way of public innovation, civic innovation.

2.2 Hacking Cívico

Civic hacking is the way and the action and participation mechanism that *Codeando México* has chosen as practice and strategy for the solution of the social issues that affect the country. *Civic Hacking*[20],[21] is defined and promoted by *Codeando México* under the following idea: "develop technology that would bring out solutions for society, where any person that is willing to, can collaborate with others and build something that would improve and help its community and its sorroundings"[22] [8], from this definition we can understand that Codeando México considers any collaborator as a *civic hacker*[23] (see Figure 1).

Figure 1. Civic Hacker ©Codeando México

Some basic characteristics of civic hacking that *Codeando México* promotes are also the ones summarized by Casanueva (2014): multidisciplinary approches, undertakes projects not products, designs events based on expectations, grows communities [9], all of it aimed to and within the frame of the open access movement (open access, open knowledge, open science, open data, open government, open source)[24].

2.3 Civic Communities

Both the context and the action and development surroundings of *Codeando México* are *civic communities*, which can be simply defined as groups of citizens that are gathered together by the common interest to solve social and citizen problems that affect either their immediate surroundings or a third party's by means of the use and development of technological tools and software.

In a theoretic study of the concept and its relation with social capital, Jorge (2013) makes a recount of the characteristics that define a civic community: "civic commitment, political equality, solidarity and tolerance"[25], and gives a definition of it: "jumbled weaving of associations that, knitted by faint trust, connects heterogeneous individuals and groups; the centrality of the value of tolerance makes the coexistence of both the community and the personal freedom possible"[26] [10].

Within this model, anyone can become a participant and member of the community, a community in which each one has the absolute ability and freedom to present, propose, collaborate with and develop solutions for specific social problems. Following this model, issues are addressed and solved as a collective, situation that also favors the enrichment and diversity of the solutions found.

There are two ways in which the dynamics and operation of civic communities can come about. The first one is the virtual way, which takes place in several communication spaces and platforms that are set up by *Codeando México*, for both the national community as well as for the local communities (Blog[27], Slack[28], Git Hub[29], Facebook[30], Twitter[31], Youtube[32], Platform[33]). The second way is the open and on-site calling known as Civic Hack Night, which tries to gather each month all of the existing communities of every city in the country together. Each calling offers the presentation of a workshop or an experience, and then gives room for the presentation and free/independent work on problems and projects.

There currently are seven consolidated civic communities: Mexico City, Guadalajara, Monterrey, Xalapa, Aguascalientes, Morelia and León. There are also another ten communities more in different cities of the country that are being taken into account for their conformation.

3. CIVIC CHALLENGES

Due to the *#App115* and *#SATMóvil* challenges results, and firmly sticking to the essence of the original project of being a Civic Platform, *Codeando México* launched one of their civic innovation proposals: C*ivic Challenges*.

Civic Challenges are basically a mechanism for the "open innovation and for the interaction between Civil Society Organizations (CSOs) and the technological community in order

[19] *#RetoSATMóvil*: government calls for civic entrepreneurs. http://web.archive.org/web/20131024232844/http://blog.codean domexico.org/post/56535821013/retosatmovil-el-gobierno-convoca-a-emprendedores

[20] Civic Hacking as citizen participation. http://altavz.com/2015/10/15/el-hacking-civico-como-forma-de-participacion-ciudadana/

[21] What is civic hacking and how can you get involved? http://www.dineroenimagen.com/2015-06-12/56978

[22] my translation.

[23] How can you become a civic hacker? http://blog.codeandomexico.org/2014/12/09/como-ser-hacker-civico/

[24] Open movement. http://opendatahandbook.org/glossary/en/terms/open-movement/

[25] my translation.

[26] my translation.

[27] Blog *Codeando México*. http://blog.codeandomexico.org/

[28] Slack *Codeando México*. http://slack.codeandomexico.org/

[29] GitHub *Codeando México*. https://github.com/CodeandoMexico

[30] Facebook *Codeando México*. https://www.facebook.com/CodeandoMexico

[31] Twitter *Codeando México*. https://twitter.com/codeandomexico

[32] Youtube *Codeando México*. https://www.youtube.com/channel/UCbX8YpuG267ipLtM4cQ4yJA

[33] Plataforma *Codeando México*. https://codeandomexico.org/

to generate solutions for the civic, public and social matters"[34] [11].

3.1 How do Civic Challenges work

Codeando México officially launched Civic Challenges in August 2016, an initiative that promotes the interaction between the CSOs and the country's technological community.

Civic challenges offer CSOs a platform where they can present their unsolved problems as a challenge for the technological teams and communities to work on and to suggest technological solutions for them.

Thanks to these challenges, CSOs get the development and implementation of a technological solution that will solve the problem they presented, and the technological team that wins gets an economic incentive which is -for now- funded by Microsoft. At this moment the challenges considered for their launching must have an impact on the Objectives of Sustainable Development (OSD) and the 2030 UN agenda[35] (see Figure 2).
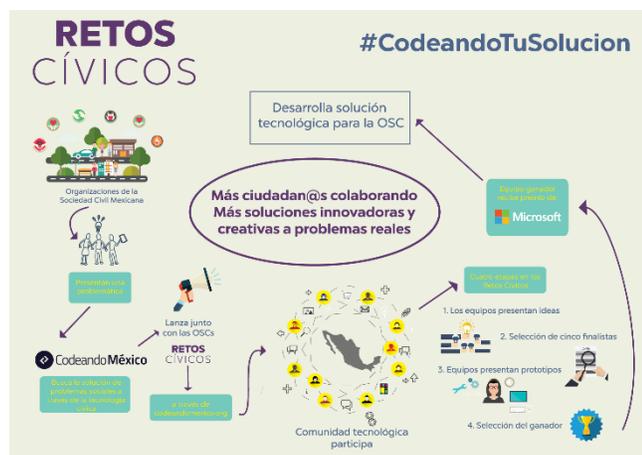

Figure 2. Civic Challenges ©Codeando México

3.2 Civic Challenges Impacts

Ever since they started *Codeando México* and its several communities have been developing and working on many Civic Challenges via their initial platform[36]. Proofs of this work are the more than 50 challenges solved -for more than 13 organizations- and the nearly 1,400 participants that have collaborated with them [12]. But it wasn't until their re-launch in 2016 that the callings became more formal and could offer an economic support and funding that would allow the winning solutions to develop their suggested applications.

It was for this re-launch that *Codeando México* designed a new platform and established new channels of communication for the communities and organizations of the civic society[37].

As a result of the first calling that was held under this new model of participation, they worked on the solution of the problems that were submitted along with the *Techo México*[38] and *Observatorio del Derecho a la Vivienda*[39] civic organizations, both of which submitted as their specific difficulty not having the irregular settlements of the marginal zones where they happen to work as organizations, mapped. This situation blocks the identification and census of risks and their subsequential attention and solution. The Civic Challenge launched to solve this specific issue was the *CoMapp*[40]; 33 groups of civic hackers participated, from which 5 finalists were selected and they were able to develop a prototype. From these 5 finalists, Startup *Euclidian*[41] was the winner, and it is currently developing the app thanks to the funding that came along as a prize[42].

This re-launch shows the early maturity, as well as the generation of a significant learning that *Codeando México* has achieved. The experience that they now have allowed them to produce a functional and dynamic model that generates and promotes civic innovation and the development of civic technology for the solution of the country's social and civic problems.

4. PUBLIC CHALLENGES

The *Public Challenge*s project is an initiative derived and conformed from the experiences that have previously been described; both the *#App115* challenge and the *#SATMóvil* challenge foretold the current guidelines for the definition and development of the institutional model of what we know today as Public Challenges.

Based on such experiences, and by means of the Mexican CEDN (National Digital Strategy Coordination)[43], the Mexican federal government, with the support from the American USAID's MEPP (Mexico Economic Policy Program)[44] and with the collaboration of *Codeando México*[45], has designed a public sector hiring model for the acquisition of technological services that is based on the development of "an on-line platform for the management of public callings so that small and medium-sized enterprises can participate as technology providers of the federal government, as well as propose digital solutions for public challenges"[46] [13].

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[34] my translation.

[35] Sustainable development goals - United Nations. http://www.un.org/sustainabledevelopment/es/objetivos-de-desarrollo-sostenible/

[36] Plataforma *Codeando México*. https://codeandomexico.org/

[37] Civic challenges – *Codeando México*. http://retoscivicos.codeandomexico.org/

[38] *Techo México*. http://www.techo.org/paises/mexico/

[39] *Observatorio del Derecho a la Vivienda*. http://www.observatoriodevivienda.org/

[40] Challenge *CoMapp*. https://codeandomexico.org/retos/150-reto-co-mapp

[41] *Eucledian*. https://www.facebook.com/eucledianCo/?fref=ts

[42] Más Tecnología Cívica para la Comunidad de Codeando México. http://blog.codeandomexico.org/2016/07/13/mas-tecnologia-civica-para-la-comunidad/

[43] National Digital Strategy Coordination. http://www.gob.mx/mexicodigital/

[44] Mexican open data initiative supported by MEPP. https://propem.org/news_events/mexican-open-data-initiative-supported-propem-showcased-central-america/

[45] More governmental challenges for the crew. http://blog.codeandomexico.org/2014/08/11/retos-de-gobierno-para-la-banda/

[46] my translation.

With this hiring model, small and medium-sized technological entrepreneurs have the opportunity to compete within an open, dynamic and participative scheme that contributes to democratize and show the federal government expenditures on the acquisition of small and medium-size services and software products (see Figure 3).

May we add that in order to make this hiring model possible, reforms to the *Ley de Adquisiciones Arrendamientos y Servicios del Sector Público* (Public Sector Law of Acquisitions and Services) and its regulations had to be made, as well as with other regulations referring to the already established hiring processes for governmental institutions[47],[48].

¿QUE ES RETOS PÚBLICOS?

OBJETIVO

Figure 3. Public Challenges ©Codeando México

4.1 Synergies of the Public Challenges Projects

One of the first synergies that the Public Challenges project counts with, is its alliance with the EDN (National Digital Strategy)[49], a relationship that became a fact when within the frame of the XIV edition of the Entrepreneur Week -August 2014[50]-, the Mexican Government, by means of the CEDN officially launched the Public Challenges projects. Its aim was to motivate the innovation of digital services and to promote the development of technological solutions for the challenges that the

country faced, thus contributing to the fulfillment of the five objectives that hold the EDN up: 1) Governmental transformation 2) Digital economy 3) Quality in education 4) Universal and efficient health care and 5) Citizen safety.

The second synergy of the Public Challenges project was to become included as a part of the 25 actions considered to be carried out by the government according to the 5 commitments of the Mexican Work Plan 2013-2015 (PA15)[51]. The Mexican federal government committed to it when signing and participating in *The Open Government Partnership*[52] global initiative. The Public Challenges project is one of the two actions that the government committed to achieve as a part of the commitment n.4: Citizen Empowerment and Participation, with which the federal government looks forward to "promote the capability of the citizens to participate in public affairs, thus transforming the government-society relationship"[53] [14].

Therefore, the Public Challenges project aims to "solve public affairs and to open the governmental offices' process to the civic innovation in order to generate the opening of data and create a civic entrepreneurs ecosystem"[54] [15].

4.2 How do Public Challenges work

Public challenges are callings that the government makes so that the citizens can present their proposals of technological solutions for the social impact problems and requests that the public management supervises. These open callings are made so that the enterprises and entrepreneurs that have the skills and competences needed to develop medium-scale software (no more than a $4,000,000 Mexican Pesos project) can compete among themselves for a contract as technology providers for a federal government office or institution, a contract that would help them achieve the digital solution they proposed in the contest (see Figure 4).

It is by means of this public innovation model that the federal government supports independent software programmers and designers in order to boost the development of innovation industries at a small and medium-size enterprises (PyMEs in Spanish) level. It also aims to lower the price of the ICTs that the Government purchases.

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[47] Agreement -*Secretaria de la Función Pública*– DOF 04-02-2016.
https://www.gob.mx/cms/uploads/attachment/file/59534/MAAGTICSI_compilado_04_02_2016.pdf

[48] Public challenges: a new way of purchasing for the Government.
http://www.oem.com.mx/ElSoldeMorelia/notas/n3729802.htm

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http://www.gob.mx/presidencia/acciones-y-programas/estrategia-digital-nacional-15899

[50] The launch of Public Challenges during the 2014 Entrepreneur Week. https://youtu.be/voMoMMLw5j8

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http://www.opengovpartnership.org/sites/default/files/pa_aga_2015%20%281%29.pdf

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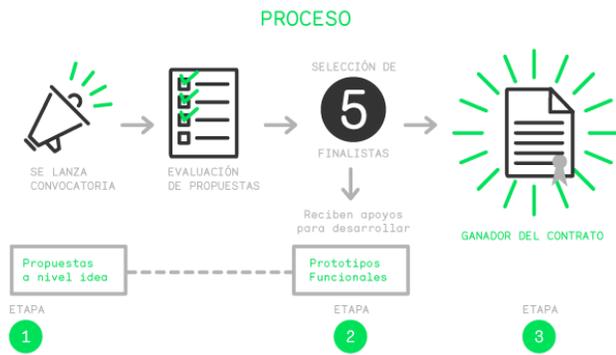[53] my translation.

[54] my translation.

Figure 4. Public Challenges Process ©Codeando México

4.3 Public Challenges progresses

After two years of their official launch, the site of the Public Challenges project had already called for the development of 15 different challenges, which derived from 12 federal government offices (see Figure 5).
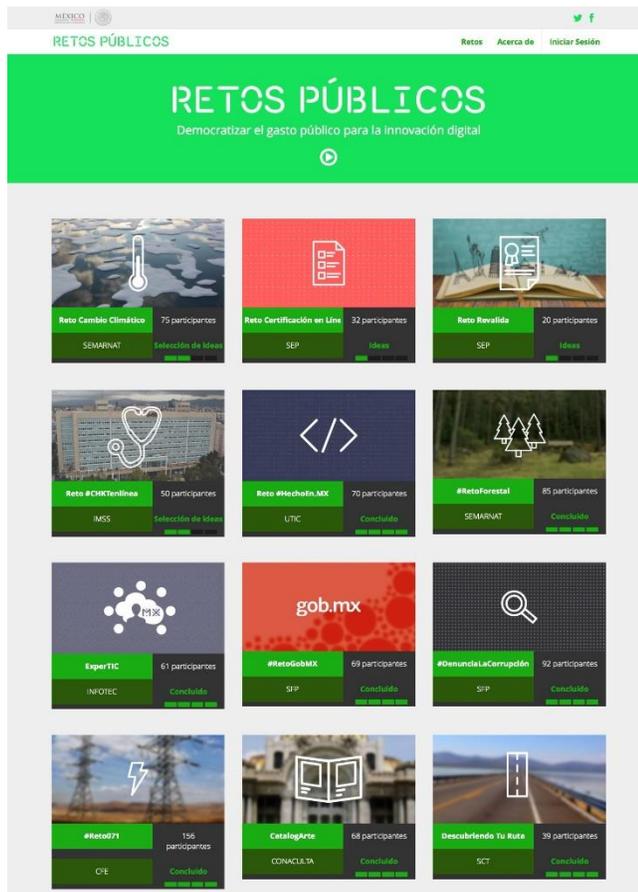

Figure 5. Public Challenges Portal

At the 4th governmental report, the CEDN declared that more than 2,500 entrepreneurs and small technological-based enterprises had participated in the Public Challenges project,

having submitted an amount of 1,700 proposals from which 75 functional prototypes were produced[55].

5. A NEW CIVIC ECOSYSTEM

Based on the experiences and examples described above, we can assert that conformation and development of a new environment for the convergences and interactions among several actors – citizens, civic hackers, software developers, journalists, researchers, civic society organizations, foundations, enterprises and government – is undeniable.

This new environment is conformed and determined by the use, appropriation and development of technological resources and tools.

The interactions that take place within that environment, among such actors and their use of technological resources and tools, give birth to a new ecosystem, a civic technological ecosystem.

This new technology-based civic ecosystem is here to face and innovate the worn out and increasingly more useless and old ecosystem of citizen participation of these days.

If we allow ourselves to make an analogy in order to explain the conformation of this new civic technological ecosystem facing the old citizen participation ecosystem, we could very well make use of the ecological succession process that takes place in biological systems, which consists on: "the process of change that an ecosystem goes through a long time due to the changes that are produced both in the conditions of the surroundings as well as in the populations that make it up and give birth to an every time more organized and complex ecosystem" [16].

The succession and process of change that are mentioned in this analogy can very well be understood as an innovation process; a technology-based civic innovation that intends to favor improvements by offering new, more efficient and autonomous solutions to old social and citizen problems.

6. CONCLUSIONS

We have seen how two initiatives that share the common background of solving a social o citizen problem by accepting it as a challenge and by confronting and treating it based on the specific interests and abilities of a community's diverse social structure, turned into a civic innovation action. They base their activity on the synergy of two main elements: 1) the appropriation of technologies as a mean and a resource, and 2) the exercise of citizenship and citizen empowerment by means of online and offline processes.

We can identify on the first of these initiatives, the Civic Challenges, that their main characteristic is autonomy and self-management, since they work from and for the citizenship. This model favors and builds empowerment and self-transformation up: "it prepares citizens so that they can decide over their destiny, worries and opportunities, by means of individual technology in order to socially innovate"[56] [17].

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[55] 4th Governmental Report- The most important results of the EDN (National Digital Strategy). http://www.gob.mx/mexicodigital/articulos/en-el-4to-informe-de-gobierno-conoce-algunos-de-los-resultados-mas-importantes-de-la-edn?idiom=es

[56] my translation.

On the other hand, Public Challenges, the second of these initiatives, focuses on the management and transparency of the purchasing mechanism of technological innovation services for the federal government. Its purpose was to become an incentive for small and medium-size Mexican enterprises which are related to this sector, so the benefits and repercussions in the citizen participation processes of this initiative are actually cut down to the participation of enterprises and developers only. This narrowing of possible participants may question if this model in fact achieves a civic impact, to which the answer is yes, it does, since civic innovation is translated in the end into public innovation, which makes use of technologies in order to "create or enhance the communication channels which facilitate the interaction between citizens and governments or the private sector" [18].

We have shown two examples of civic innovation, innovation that should not be limited or brought to a standstill, neither should it be taken as a recipe, just like citizen participation and its demand for solutions to their problems and needs shouldn't be paralyzed or stopped. May the sharing of Codeando México's experience motivate the development of new initiatives, new communities, new networks, new knowledge and experiences, but most of all, solve old and new challenges for the social and citizen problems that trouble each of us at our own regions.

7. ACKNOWLEDGMENTS

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