



Rethinking Digital Inclusion

# Makerspaces and Digital Literacy in Rio de Janeiro



Instituto  
de Tecnologia  
& Sociedade  
do Rio

## Technical information

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# PRE- SENTA- TION

**This report results from a partnership between the Institute for Technology and Society of Rio – ITS Rio – and the Mozilla Foundation, and has the objective to promote digital empowerment of community networks, based on the transformation of Lan Houses into decision-making spaces.**

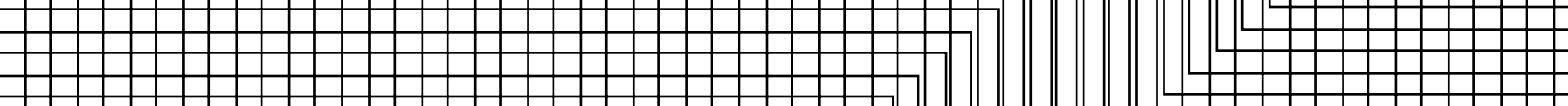
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In face of the emergence of a new culture permeated by the spread of mobile and disruptive technologies, it is fundamental to insert effectively the country in this panorama in order to allow the entire population to benefit from the numerous opportunities that these changes arouse. In this sense, the present project foresees the use of Lan Houses as embryonic spaces for digital empowerment, capable of mobilizing networks of citizens with the purpose of re-creating the *webmaker* culture that Mozilla encourages in their communities.

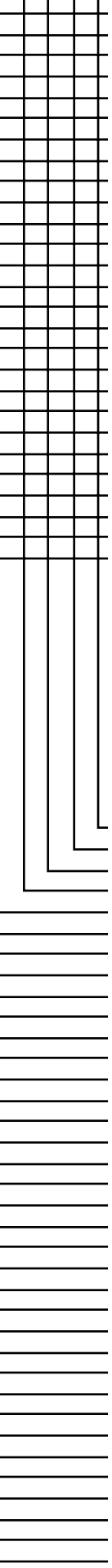
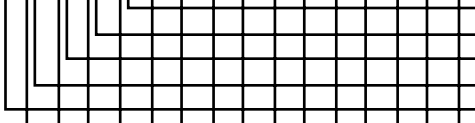
Recognizing the importance that Lan Houses exerted for digital inclusion and the challenge they face today when it comes to surviving in a context of increasing digital mobility, the project aims to rescue the potential of Lan Houses as agents of social transformation. To revitalize, in this sense, means to bring education as a starting point for the promotion of the *maker* culture – or the “culture of doing” – in order to empower citizens of decentralized spaces and to promote their effective participation in the knowledge society.

In order to achieve this goal, the project carried out numerous initiatives in six Lan Houses in different regions of the city of Rio de Janeiro, which comprised workshops, events led by the Lan Houses, as well as a field research with both owners and users of these spaces.

The following report presents an



introduction to the emergence of the *maker* culture in the 21st Century and its impacts on the world. Then, we address the results of this action in Brazil, whose methodology based on a qualitative research conducted with the owners of the Lan Houses and with the attendants of the workshops of Mozilla, in order to evaluate its result and to assess whether the Lan Houses would regard themselves as potential *makerspaces*.



# IN TRODUCTION

By André Alves Garzia

Mozilla Rep

**The digital mode pervades the majority of human processes and activities in the current world. From the banking system and the business and government management to entertainment consumption and the dissemination of knowledge, everything encompasses computers and the Internet. Peculiarities of our time include both the facts that youngsters increasingly use computers and the Internet at their earliest age and that smartphones are nearly omnipresent. Nonetheless, we not always use these technologies consciously and aiming at fully seizing the creative power that they ensue.**

The Internet is also the only channel of mass communication in which everyone can have a voice. Anyone can post one's dreams, desires, wishes and memories on the Web. The domain of this medium hence becomes fundamental.

In the 21st Century, effective participation in society is viable only for those who are able to seize current opportunities through the mastery of at least the basic knowledge on digital media. The new skills required for this directly relate to the creation of new educational and professional opportunities. We can certainly always find people living on the fringes of this, but the focus must be on effective participation in this new context.

Established and easily accessible systems of digital literacy are necessary so that

everyone is able to participate in the digital world. If digital technologies increasingly mediate current processes and relations, the future will be even more revolutionary. As we will acknowledge, we are facing a new industrial revolution that, unlike the previous one, prioritizes authorial and personal production.

We need to teach digital skills to the new generations now, so that they can seize all the opportunities that stem from a more 'maker' world, that is, from authoring and personal production. Digital empowerment entails chiefly digital literacy.



## Why work within Lan Houses?

The Mozilla Club project comes into being with the goal of establishing an Internet “made by everyone and for everyone”. In order to materialize this view, people need to learn how to produce content instead of only consuming it. The collective effort of humanity in terms of assuring a free Internet is a movement that resists the trends of an industry seeking to turn the web into a blend between a cable television system and walled gardens of smartphone ecosystems, according to which the great motto of the network would be the easy consumption of content.


Mozilla pursues an Internet made up of creators. We witness a permanent fusion between the digital and the physical worlds thanks to the growth of the *maker* movements and the spread of the “Internet of Things”. It is thus crucial that people understand that everyone has the potential to produce their own objects, and that they can come up with the solutions for their own day-to-day problems.

The Mozilla Clubs form a program of the Mozilla Foundation aimed at teaching new digital skills in a practical and informal way,

based on regular meetings and mentoring. The clubs receive *resumés* and training materials from Mozilla and are encouraged to participate in an online community by exchanging experiences with other clubs around the world, thus contributing to the collective growth of the program. Mozilla tailors the material and the methodology according to the local reality of each club. Mozilla equally spurs them to build their own solutions to their demands, based on the use of the devices of these spaces. For this purpose, Mozilla held learning workshops.

Currently, there are more than 100 clubs spread across 22 countries. Each of these clubs exerts impact on the local community, and the largest of them is not located in the Silicon Valley nor in other financial and informational hubs, but rather in poorer neighborhoods in Brazil, India and the African continent.

In its initial phase, Rio Mozilla Club was a pilot project that sought the best way to teach new digital skills in LAN Houses (or “LANs”) in the districts of the north and west of Rio de Janeiro. In addition, the project glimpsed the potential of revitalizing the LAN Houses in order to turn them into spaces for creation and technological experimentation. The proposition was to rethink the Lan Houses of the city of Rio de Janeiro from the perspective of the *makerspaces*.



The project begins with a field research that analyzes the situation of the LAN Houses in Rio de Janeiro, as well as the existing opportunities for teaching in these spaces. Hence, we envisaged the possibility of exploring the capillarity of LAN Houses and their inclusion in the routine of the peripheries as a space for the practice of our technological experimentation and digital literacy workshops. LANs are the ideal medium to reach a gigantic layer of the population that does not have access to other initiatives, as well as to revitalize such an important sector for the Brazilian digital empowerment.

The process is long and begins with basic knowledge on digital literacy, but the future is radiant, with multidisciplinary spaces in each LAN House and with the free exchange of knowledge enhanced by the Internet. In our view, the large companies that dictate possibilities will not be the ones to implement the New Industrial Revolution, but rather the numerous small manufacturing communities scattered around the peripheries of the world, who will own and distribute the new revolution.

# FORE- WORD

By Yasmin Thayná  
Researcher at ITS Rio

**One of the ambitions of the Rio Mozilla Club project consisted in working in LAN Houses on the outskirts of Rio de Janeiro. By recognizing the relevance of including these communities as a priority for the country's insertion in the digital universe, the project aims to encourage this population to participate effectively in the 21st Century. It is noteworthy, however, that there is no single notion of periphery since peripheries are multiple.**


Once we focus on the aspects of technology and its uses in humble territories, we perceive meetings, undertakings and a lot of desire to modify the surroundings with regard to social and economic issues. In this context, digital inclusion is already outdated, as it is no longer the only issue at stake. Thanks to social networks, smartphones and other digital tools, the periphery not only overcomes this gap but also uses these media as strategic tools to connect itself into all directions. The periphery even regards these media as a determining field for business development.

In any case, creation based on existing resources has always been the overarching technology used in humble territories. The barbershops at the slums, run mainly by young people, appear as a place of gathering, exchange and, at the same time, survival. The eldest woman in the neighborhood, for

example, used to make sweets and wedding dresses, to the extent of becoming a great reference. By expanding her business, she began to serve people farther away from those she had been serving until then. The construction of roller carts out of leftover bearings collected in the junkyard, besides being fun objects for boys and girls, also served to transport things.

Who remembers when the gas ran out in the middle of the bean preparation? The way out was to finish cooking it at the neighbor's house. When in need of a private car, for instance, one exhorted to that contact that made trips for half of the price charged by ordinary taxi drivers. By the end of the afternoon, street food carts perfumed the streets with sales so varied that ranged from 'angu' and hamburguers to sweets and drinks.





All these experiences have become services thanks to digital platforms, entrepreneurship and the *maker* movement. I remember when I first heard, with a certain tone of novelty, the definition of entrepreneurship and *maker* movement. I swiftly reacted to it: but isn't that what we perform and perceive once we live in community?

In Bahia, the conception of a free online platform implied enabling people to make or exchange anything. You can take a movie class, play tarot, or let go of that shirt that you do not like any more and that can fit someone else. All this is done free of charge, in order to establish "more love among us", as the name of the initiative suggests.

The idea of a business to help improve the health and well-being of those presenting the highest rates of diseases such as hypertension and diabetes arose in a Rio de Janeiro slum. It was with this intention that one of the biggest salad vendors in the country started to sell salads not only in Rio, but also in other Brazilian states. Thanks to technology, the initiative has become a business with which he not only profits but also grants more quality of life to his community.

Concerned about their local realities and needs, the "*makers*" succeeded without

bothering with strange or foreign titles and nomenclatures. This is the main characteristic of the entrepreneur or *maker*: the one who performs with pragmatism, who solves a problem while creating a solution.

If Lan Houses previously played the role of creating an exchange environment while offering access to the Internet, today the periphery, which has always survived with its own resources, expands these spaces of exchange and learning by transforming its own territory into a connected place, with relevant experiences that improve their lives in community. In addition, many of these local initiatives are already able to expand and communicate with other parts of the world. This is because the periphery is, and has always been, a great innovation environment, without ever having to worry about innovating.

# 1 UMA NOVA ECONOMIA E A CULTURA DO FAZER

**A new industrial revolution is under way. If the increasing spread of computers and the Internet has revolutionized the way people, industries and governments relate and produce knowledge, this new wave will also transform the way we produce material goods.**

Think about the impact that the democratization of access and of content production represents in the sense that PCs and smartphones allow people from different locations to be authors and promoters of their own content. Transfer these possibilities to the world of manufactures. What will happen once we will all be able to become manufacturers, when all of us will be able to make our own products and to meet our own demands? The pulverization of the means of production in addition to home-making – concepts associated with the *Maker* Movement – are key to understand this new mode of social organization that emerges, as well as the main drivers of the *maker* culture.

The international consultant Deloitte highlights in its 2013 study *Impact of the Maker Movement*<sup>1</sup> : “The *Maker* Movement will emerge as the dominant source of livelihood as individuals find ways to build small businesses around their creative activity”. The document also lists five upshots of this process: collaborative production, disruption of current large enterprise models, demand-driven production, practical education, and the development of local businesses.

Consequently, we can expect a territorial distribution of the means of production, which tends to profoundly alter the logic of where, how and for whom we produce. This movement

<sup>1</sup> Available at <http://oaklandmakers.org/wp-content/uploads/2014/06/Impact-of-the-Maker-Movement.pdf>

underpins the foundations of a Third Industrial Revolution. For Chris Anderson, editor-in-chief of the American magazine *Wired* and author of the 2012 book *Makers*, the essence of this new revolution is the encounter between manufacturing and the web revolution.

Accordingly to *The Economist*<sup>2</sup> from April 2012, “Factories used to move to countries with low wages in order to reduce their costs. But these costs will be less and less important: from \$ 499 for the first iPad, only \$ 33 was for manufacturing and \$ 8 for the final assembly in China”. The magazine points out that this change occurs mainly because “companies now want to be closer to their customers so they can respond more quickly to changes in demand. And some products are so sophisticated, that it’s better to have the people who designed them with the people who produce them”.

<sup>2</sup> Available at <http://www.economist.com/node/21552898>

As is the case of the entertainment and information industries, the manufacturing industry will have the challenge to rebuild the relationship with the consumer – who is increasingly becoming a potential competitor. The speed required for responses increases, and a rebalance between scale and fragmentation is

in progress. “Technological advancements make it easier and cheaper for individuals to create their items and bring it to a large audience, which allows a proliferation of small businesses,” the Deloitte study adds.

Production displacement and pulverization give rise to important discussions on development models for countries and open new frontiers of social transformation. Along with this new *maker* reality, there is also an ecosystem to support these producers, usually made up of micro and small companies, whose services range from logistics and storage to spaces for production and for design.

**As is the case of the entertainment and information industries, the manufacturing industry will have the challenge to rebuild the relationship with the consumer – who is increasingly becoming a potential competitor.**

**In other words, the new phase of the digital revolution opens up opportunities for new markets, jobs and income. Above all, it enables the emergence of more inclusive models, based on a circular economy and on open innovation.**

Decentralization and collaboration outline the economy that has arisen on the grounds of the digital revolution. It suffices to compare the music industry before and after the Internet. Nowadays, the business no longer revolves around the distribution of media; its focus is rather on content – which even fans can share – and on the prospects for interactivity that digital platforms offer.

In the information society, we are all consumers and producers of knowledge. And “these transformations are not exclusive features of domains such as Culture, Information and Science. They affect not only the supply of energy (as evidenced by the explosion of solar panels in homes and commercial establishments in the United States and several European countries), but also the material production

itself. Or, as Chris Anderson says, the digital revolution has come to the workshop”, explains USP professor Ricardo Abramovay in an article from 2014<sup>3</sup>.

## 1.1 Products of the New Economy

An example from the United Kingdom has democratized the production of houses: the WikiHouse. This platform provides tools that allow you to design and customize walls, ceilings and other structures of the property. The interested buyer downloads the kits with open digital files, which can be changed, remixed and sent for printing on CNCs, machines that work as digital lathes.

Likewise, the *Open Desk* project stands out, as it connects designers to users by providing free and paid furniture projects ready to print and assemble. It follows the same logic that guides the Brazilian project *Designoteca*, which offers, at low

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<sup>3</sup> Available at [http://ricardoabramovay.com/wp-content/uploads/2015/02/A-Economia-H%C3%ADbrida-do-S%C3%A9culo-XXI\\_De-Baixo-para-Cima\\_Abramovay\\_12\\_2014.pdf](http://ricardoabramovay.com/wp-content/uploads/2015/02/A-Economia-H%C3%ADbrida-do-S%C3%A9culo-XXI_De-Baixo-para-Cima_Abramovay_12_2014.pdf)

cost, national pieces of robotics and prototypes to print in 3D, among other possibilities of digital manufacturing.

Once we consider the digitalization of CDs and books, it is not difficult to predict that in the near future we will talk about tables, chairs and houses in terms of layers: the one of information and the other of physics. “Peer production, open source, crowdsourcing, user-generated content – all these digital trends world have begun to play out in the world of atoms, too. The web was just the proof of concept. Now the revolution hits the real world. In short, atoms are the new bits”, sums up Chris Anderson in *Wired* magazine in 2010 <sup>4</sup>.

This does not mean that mass production will disappear. In fact, the question we should raise is: how will the consumer behave since he/she will no longer only buy a table and chair, but will also choose, remix and edit his/her furniture projects? Abramovay suggests the following: “Just as the Internet abolished the passivity of

the spectator and the listener and made interaction and remixing the basis of contemporary culture, this new industrial revolution can render social network collaboration the main foundation of wealth creation in today’s societies”<sup>5</sup>.

## 1.2 Fablabs, Makerspaces, Hackerspaces: the new centers of innovation

What does it take for this revolution to take shape? Many novelties have boosted the answer to this, as illustrates the expansion of shared *makerspaces* such as the Fablabs network, which consists in places usually equipped with a precision milling machine, 3D printers, laser cutting, vinyl cutting and sewing machines, and components of electronics and robotics.

By 2016, 638 spaces of this type were already functioning – more than half of which started in the last two years, which shows the rapid expansion of the movement. The MIT Center for Bits and

4 Available at [https://www.wired.com/2010/01/ff\\_newrevolution/](https://www.wired.com/2010/01/ff_newrevolution/)

5 Idem

Atoms of the United States launched the initiative in 2005, with the goal of bringing innovation tools to ordinary people, anywhere in the world. The network counts on the cooperation among its members and establishes protocols to encourage collaboration and to technically assist its members.

The year of 2005 also epitomized the launch of TechShop, an endeavor whose idea is to grant people access to sophisticated machinery by paying monthly fees. In practice, it functions as an industrial park available to anyone, whether lay or initiated. In the United States, there are currently eight stores with more than two thousand square feet each. These places have launched inventive projects such as OpenRov, a small, low-cost robot capable of underwater exploration in hard-to-reach places.

**Both Fablabs and TechShop fall into the category of increasingly popular makerspaces. These spaces constitute innovation-oriented areas that democratize access to tools previously restricted to industries or governments.**

The definition of *maker* movement goes back to 2005, when American Dale Dougherty first used the term to appoint to *Maker Magazine*, a magazine entirely geared towards the audience that develops “Do It Yourself” projects <sup>6</sup>.

There is no common infrastructure or standard for a *makerspace*, although their features resemble those of digital manufacturing, electronics, as well as analogic techniques of ceramics, handicraft, and joinery techniques, typical of DIY (Do It Yourself). They may be more sophisticated, like the examples above, or simpler, as community centers of production and of stimuli to experimentation.

In fact, the DIY culture dialogues directly with the *maker* scene. Born in the underground, post-punk and anticonsumerist context, DIY had the premise to give people autonomy to produce, on their own, whatever they wanted. It is a freedom similar to that rescued now by the rearrangements of industry and technology, which allow each

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<sup>6</sup> Available at <http://www.wired.co.uk/article/maker-movement>

one, alone or collectively, to produce their table, their home or their computer game.

The hacker culture also had its share of influence over *makerspaces*, since it guided the development of personal computing in the 1960s in the United States and stimulated the notion of democratization of information. In this context, hackerspaces arise as spaces in which the users share experiences related to the development of software and of electronic projects. Currently, 1,239 spaces already add up in the total of the continents registered in the platform hackerspaces.org – the oldest one in operation is the Chaos Computer Club, created in 1981, in Berlin, Germany.

Structured as self-managed communities that cherish radical horizontality, hackerspaces differ from fablabs and *makerspaces* rather by political positioning than by functioning. In the latter two, the acting bias is broader and, in some cases, even commercial.

Albeit the conceptual, political and ideological differences between these

spaces, in practice, what we perceive are loose barriers and many active hybrid groups. Since there are no closed definitions, it is not always easy to classify the spaces and groups that are active in the *maker* movement.

“While technology has been the spark of the *Maker* Movement, it has also become a social movement that includes all kinds of making and all kinds of *makers*, connecting to the past as well as changing how we look at the future. Indeed, the *Maker* Movement seems to be a renewal of some deeply held cultural values, a recognition rooted in our history and culture that making comes to define us”, wrote Dale Dougherty in the article *The Maker Mindset*<sup>7</sup> when explaining his vision of the movement.

## 1.3 Influences of the open source culture

The foundations of the hacker culture, of the Internet and of the *maker* movement

<sup>7</sup> Available at <https://llk.media.mit.edu/courses/readings/maker-mindset.pdf>

are the same: free software, free hardware and free design communities. The sociologist Sergio Amadeu explains in *Ciberativismo e Cultura Hacker* what free software is: “it relates to communities of hackers who develop computer programs with open source and permissive property licenses that allow to use, copy, thoroughly study, improve and distribute the changes made in the software. The source-code of a software contains the closely chained logic routines in a programming language, which displays everything the program performs. The source-code, once transformed into machine language, becomes an executable code. In possession of the source-code, you can know, change and improve the software”.

Hardware and free design follow the same logic: “Even if you cannot simply send a home automation system through the network, for example, it is perfectly possible to send the design of the same through an email or another collaboration tool. Many of these computer-aided design programs, CADs, begin to show

up free of cost over the web. Whether it’s for designing an electric circuit, for conceiving a 3D model of a part of a car or for creating pieces of a wooden toy, everything can be created digitally with free tools and shared on the network using easily manipulated file formats”, explains the engineer Manoel Lemos in the article “De Volta aos Átomos” (“Back to the Atoms”), published in June 2014 in the magazine *Itaú Cultural* <sup>8</sup>.

**If, on the one hand, it is true that the practice of open source allowed the birth of the maker culture, on the other hand, not all the productions generated in this scope are free.** The clash between opening the code of a project or making it economically viable is a constant dilemma in a world in which the generation of intellectual property still measure many countries.

In this context, one can see how heterogeneous the movement is. The universe that revolves around hackerspaces has openness as a core

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<sup>8</sup> Available at <https://issuu.com/itaucultural/docs/observatorio16>



value, whereas many fablabs praise the generation of well-finished and scalable products, which often entails the adoption of patents and of proprietary forms development.

There are also hybrid models that try to reconcile financial sustainability with democratization of knowledge: only part of the project is open. An example is littleBits, an electronic kind of Lego that allows everything from learning the logic of programming to building prototypes in modules whose hardware is free, but the design and the connection system between the modules are not.

Despite the many influences that the movement suffers, precisely this hybrid characteristic can ever more move it to the mainstream of the productive system. At the same time it empowers society, this dissemination raises important questions about the core of this phenomenon: What will the value of the *maker* culture be once it is induced – and no longer spontaneous?; What will happen when the manufacturing communities start relating to the traditional industry?

These are concerns that emanate from publications and conferences around the world<sup>9</sup> and expose a possible appropriation of the *maker* culture opposed to its idea of birth, when it provided a counterpoint to the society of unbridled consumption. The nuisance has raised the need to approach again the circular economy, based on the reuse, the recycling and the recovery of available resources.

Conversely, initiatives such as the *WeSMS* project – a system that connects Pakistani artisans to the resellers' stores via SMS – demonstrate the potential for social transformation deriving from the sum of technology with entrepreneurship and innovation. The project was the outcome of the last IDDS (International Development Design Summits) meeting in 2016, which comes up with activities to spark the sustainable development of peripheral regions by combining analog technologies with digital ones.

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9 For instance, this was the theme propounded at the 2016 Transmediale Festival, which takes place annually in Berlin and puts forward the integration and the intersection between culture, art and technology.

Whether in the peripheries or in the great centers, the *makerscene* casts about relevance in social transformations. A 2015 global meeting in Paris brought together 100 *makers* and social innovators to build 12 prototypes in order to accelerate the transition to a circular economy that produces less waste and is not dependent on fossil fuels. The results included a system for the production of small-scale food in urban spaces, a homemade solar panel and a shower that filters and cleans water for reuse. On top of it, the initiative openly distributed all of these projects over the Internet.

## 1.4 The maker movement in Brazil

In Brazil, many *maker* initiatives use new technologies to empower people as much as to reduce inequalities. With regard to public policies of digital culture, the Ministry of Culture's endeavor to carry out policies between 2003 and 2010

resulted in the flourishing of these initiatives. In addition to the project by ITS Rio and the Mozilla Foundation, which we will present below, there are innovative cases.

There are ongoing actions in the most diverse places and contexts in the country. Take, for instance, *LabMaker Macoronga*, which fosters entrepreneurship in the Tapajós National Forest in Santarém, Pará. Another illustration is the Gambiarra Favela Tech program by Olabi Makerspace in partnership with the NGO Observatório de Favelas, in Rio de Janeiro, which stimulates inquiries on the production of technology in works made with garbage and with reutilization of electronic components.

It is also noteworthy that **the country is home to one of the main fablab public projects in the world – the FabLab Livre network, which came into being in São Paulo in 2015. It currently maintains 12 government-run public spaces and provides maker equipment and knowledge in the periphery.** Still in

the capital of São Paulo, autonomous *makerspaces*, namely *MiranteLab*, also initiate relevant actions, such as the “Drone da Dengue”, a small air vehicle that maps out *Aedes aegypti* mosquito foci.

All these initiatives rendered greater exposure of the movement in the media. In March of 2016, the national network broadcast a series on the theme, which intensified the uproar around the *maker* scene. Named “Fablab: Do It Yourself”<sup>10</sup>, the show featured projects such as the manufacturing of child prostheses on 3D printers and the assembly of a CNC in order to customize furniture for an educational NGO.

Inserted in diverse realities, with distinct purposes and configurations, these small examples demonstrate the potentials that appear with the bottom-up appropriation of new technologies. Whether it aims to solve specific infrastructure problems by using creativity and low-cost techniques, or to display new skills that guarantee employment or income, the *maker* scene

represents an interesting opportunity for those who want to rethink the system in order to expand their frontiers of possibilities.

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10 The program *Fantástico*, by Rede Globo, exhibited the series along four episodes during one month.

# 2 MAKER EXPERIENCE AT LAN HOUSES IN RIO

In face of the panorama described, there is a need for initiatives that support the development of the new economy. Being commercial establishments for Internet access, Brazilian Lan Houses are crucial in this context, as they constitute a space of enormous potential for social transformation by uniting technology, entrepreneurship and innovation.

## 2.1 Lan Houses

In the past, Lan Houses became key spaces for the democratization of Internet accessibility in Brazil. **In 2008, only 18% of the country's homes had access to the Internet. Therefore, paid access centers, better known as Lan Houses, constituted the places with the highest Internet access in Brazil,** according to a survey conducted by Cetic.Br, the Center of Studies on Information and Communication Technology. In the book *Pontos de Cultura e Lan Houses – estruturas para inovação na base da pirâmide social*,<sup>11</sup> Ronaldo Lemos and Joana Varon Ferraz (2011) state that, regardless of public policies, the rapid proliferation of these services – mostly of an informal nature – took place thanks to the effort of family microentrepreneurs, and this development is essential for innovation at the bottom of the social pyramid. The growth of this type of entrepreneurship without any specific public policy and with greater concentration in rural areas, in the North and in the Northeast regions as well as in low-income

11 Available at <http://bibliotecadigital.fgv.br/dspace/bitstream/handle/10438/10694/Pontos%20de%20Cultura%20e%20Lan%20houses%20-%20Estruturas%20para%20inova%C3%A7%C3%A3o%20na%20base%20da%20pir%C3%A2mide%20social.pdf?sequence=1&isAllowed=y>

neighborhoods, drew sufficient attention for Lan Houses to become focus of a research, the ICT Lan Houses, once held in 2010 by Cetic.Br<sup>12</sup>.

In spite of many existing discussions on this phenomenon, the research has consolidated the importance that these places exerted mainly for to the digital inclusion of the Brazilian peripheries. Some projects came up as a response, such as Farol Digital and Raio Brasil. At the time, most people regarded LAN Houses as places where teenagers gathered to play in a network, but primarily as spaces of sociability in a country where the infrastructure of public spaces remains a quandary. The Lan Houses were still points of contact with e-government public policies as well as spaces for production and access to culture and education via distance learning courses, for example, besides being a center to provide basic services such as printing and scanner.

In recent years, however, the steep

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12 Available at <http://cetic.br/media/docs/publicacoes/2/tic-lanhouse-2010.pdf>

increase both in the use of home Internet and in the access via mobile Internet was proportional to the decrease in the percentage of Internet use at Lan Houses. **If in 2008 Lan Houses constituted Internet access spaces, the ICT Households 2014<sup>13</sup> unveils a very different reality: only 11% of those interviewed aged 10 years or above access the Internet in paid public centers.**

According to the ICT Households 2014 survey, the percentage of Brazilians aged 10 years old or above that accessed the web through cell phones more than tripled in the last three years: in 2011, this proportion was of 15% and reached 47% in 2014, which means, in absolute numbers, 81,5 million people. Despite the rapid growth of mobile Internet use in all social classes, the research also points out that the inequality in Internet access in Brazil persists. In this sense,

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13 Available at [http://cetic.br/media/docs/publicacoes/2/TIC\\_Domicilios\\_2014\\_livro\\_eletronico.pdf](http://cetic.br/media/docs/publicacoes/2/TIC_Domicilios_2014_livro_eletronico.pdf)

we can withhold that we are not facing the demise of Lan Houses, as we are still far from an egalitarian and qualitative digital inclusion in the country.

With the rising diffusion of the use of mobile technologies, people access the Internet mainly through cell phones, so much so that Lan Houses are going through a moment of redefinition of their business model.

## 2.2 Rio Mozilla Club Project

The project “Rio Mozilla Club” aims to promote the use of technologies by youngsters and to develop new digital skills using Mozilla *Webmakers* tools in Lan Houses.

Launched by Mozilla Foundation in partnership with the Institute for Technology and Society of Rio and with the support of the Ford Foundation, the project included workshops at Lan Houses in the peripheries of Rio de Janeiro, based on methodologies and tools developed by Mozilla clubs in various parts of the world.

The goal was to empower users of Lan

Houses as local problem solvers by using technology and connecting to networks of *makers/webmakers* from other communities in Rio de Janeiro. The project sought to transform participating Lan Houses into spaces for the promotion of the *maker* culture and for digital empowerment.

## 2.3 Methodology of the Workshops

The project adopted a pedagogical model based on applied learning developed by the pedagogue H el ene Petry, and consists in learning from practice or “learning by doing”. The project thus adopted this pedagogical model, comprising participatory workshops in which Mozilla facilitators helped attendants to perform activities ranging from literacy in the use of the Internet to the experience of basic programming and the “Internet of Things”.

The people who attended the workshops were generally regular users of Lan Houses or users’ friends. The LAN House owners initially advertised the events

– via the LAN House Facebook page or WhatsApp groups.

In the workshops, participants remain alone or in pairs – according to the capacity of the Lan House and the number of participants – and with a computer. Each workshop lasted between 2h and 2h30min, and followed the dynamic described below:

1. Introduction to get participants to start moving around: in the form of a question – for example: “What do you like to do on the Internet?”; “What sites do you enter on the Internet?” – to which participants can respond anonymously.
2. “Technical” activity, usually longer, focusing on learning a concept, such as: “Let’s find out how the Internet works”; “Let’s find out how computers connect to each other,” or “Let’s figure out how to act online.”
3. “Creative” activity, in which the participants express themselves by sharing opinions, dreams and desires. During this activity, they end up creating

something, and it does not matter if it is a digital, a material or a mixed creation. Some examples of this type of activity include creating a page with a gallery of one’s favorite singer’s Youtube videos, designing your favorite movie poster or inventing “memes”.

4. Assessment of the day by the end of the workshop, in order to question the participants about what worked during the workshop, what did not work and what they would like to see in the future.

The format and the implementation of the activities depend on the audience of each LAN House (some have a younger gamer audience, while others have an older audience, made up of users of a particular type of platform). The socioeconomic contexts of the peripheries where the LAN Houses are located also influence the definition of the activities and the dynamics in the workshops. The workshop coordinators try to adapt their methodology to the contexts of each LAN House in order to render the project effective and relevant.

## 2.4 Results of the project

The project lasted 10 months (from July 2015 to April 2016), and yielded 30 workshops in three Lan Houses, located in Padre Miguel, Santa Cruz and Abolição. An average of 18 people participated in each workshop, influencing more than 500 people. Out of 18 people, two people on average were women. Among the participants, the majority were adolescents between 13 and 18 years old, and three in four people participated in more than one workshop.

The average was of two women per workshop, a figure that varies depending on the LAN House (at the CID Matriz LAN House in Santa Cruz, half of the participants were women in several workshops), but this is not representative of what usually happens. For the project coordinator, André Garzia, this depends rather on the type of audience that each LAN House allures, which is most evident among young audiences.

The integration of women into these spaces was indeed one of the relevant

challenges of the project. As an example, after one of the workshops, the volunteer team asked each participant to bring along a female guest to the next workshop. This action did not work, and when questioning the reason for this, the answer was that the women they tried to invite consider LAN Houses as an unsuitable place for women.

Moreover, another relevant finding is that a large proportion of workshop participants are recurrent. In a workshop with 20 participants, there may be up to 15 that have already been part of another workshop. This demonstrates the engagement of these people in the project and their willingness to participate in the process.

For the project coordinator, André Garzia, people participate in the workshops for two reasons. Firstly, attendance is due to the social experience that the workshop entails, since LAN Houses entice contact among friends and new friends in activities that are not Games. Secondly, frequency is satisfactory due to learning, as many people showed interest in understanding the bases



of programming, and several of them, especially in the gamer public, expressed the desire to learn how to program games. The most entertaining activities were very successful, as well as robotics and multimedia content creation: “all these activities had engaged the participants so much, that they realized that the workshop space served for them to move and build things, which pushed them to participate and made them more comfortable in the events”, said André.

In addition, the workshops exerted a direct impact on the relationship of users with the Internet itself. During a workshop that addressed network privacy, many participants mentioned how much this debate changed the way they used new technologies: they began to reflect more before authorizing certain uses, before releasing and making online content available, and began to think about the possible consequences that this might have. To sum up, this whole process

inspired a critical posture of the participants regarding their access to the web.


With regard to the three key figures of the project, it was identified that the owners of Lan Houses play a central role in the process. The owners of the researched

Lan Houses exert great influence not only on the business in general, but also on young users. In Jecsandi, for example, a Lan House owner is considered a charismatic leader and a role model, which reflects on the way business users regard the Internet.

Users of Lan Houses, with respect to their interest in Mozilla workshops, seize the opportunity to associate the time they spend at Lan Houses with some profit. The biggest dream is to create content for the Internet as a source of income, as a business model.

Finally, workshop monitors are equally key in the process, especially in youth empowerment. In general, youngsters

People participate in the workshops for two reasons. Firstly, attendance is due to the social experience that the workshop entails (...) Secondly, frequency is satisfactory due to learning.



that attend the workshops are dreamers about the future, and the mentor is the essential figure for users to overcome the feeling of apathy and to consider Lan Houses as content production spaces rather than consumer spaces.

# 3 LAN HOUSES AS CENTERS OF INCLUSION AND EMPOWERMENT

Rio Mozilla Club propounded the experience in order to usher an investigation related to the possibility of new uses and new activities within LAN Houses. In order to verify this information, Rio Mozilla Club conducted interviews with six LAN Houses owners, of whom three participated in the project <sup>14</sup>.

**Throughout the interviews, it stood out that all LAN Houses heard are somehow surviving ventures in their neighborhoods.** We have identified their major difficulties and opportunities, as described below.

## 3.1 Financial issues and local integration

The majority of Lan Houses opened as entrepreneurship in the early 2000s, during a growth momentum. Nowadays, these establishments are one of the few that remain open in their localities, as is clear in the testimony of the couple that owns the Lan House Poubel, in Sepetiba neighborhood: “When I inaugurated mine, there were 28 LAN Houses in Sepetiba. There must be six at the most today. Mine is the oldest. Everything got expensive, including the rents. People were also giving up because there is the maintenance of the machines, and the technicians charge a lot of money. My advantage

<sup>14</sup> Lan Houses involved in the project: Matriz, in Santa Cruz, and KauMath, in Padre Miguel (western zone); Super X, in Abolição (northern zone). Lan Houses not involved: Infonline, in Engenho Novo; Lan House Poubel, in Sepetiba; and Blender Vaamonde, in Cidade de Deus.

is to have the Lan House behind my house, so I do not have to pay a rent”<sup>15</sup>.

Today, so many difficulties bog down Lan Houses in communities, that the hardship often goes beyond financial issues, as the owner of a Lan House in Cidade de Deus Blener Vaamonde argued six years ago: “Virtually all LANs here in Cidade de Deus have closed. Traffic dominates this area; they still control the population. They own Internet. There’s only “Oi” and “Velox” here. And we have Internet provided by them. A fight has taken place recently, so they clamped down the Internet. Two remaining LAN Houses ended up closing. I survived because I put “Oi”. Even if people have access to the Internet via cell phone, through 3G, not all people do so. People here have very low income”<sup>16</sup>.

Given this context, the owners identified some elements as differentials to keep their businesses open: own property; community trust in the neighborhood;

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15 Interview conducted during the project

16 Interview conducted during the project

investment in improvements in speed and in quality of the Internet; and discounts for schoolwork.

## 3.2 Quality of the Internet and mobility

The Interviews conducted throughout the project both with users and owners of Lan Houses revealed that games were an important phenomenon for the emergence of this sector, but not enough to ensure their development. As Jecsandi told us, 90% of the public that currently goes to LAN Houses comprise young people who go after games. “So the Rio Mozilla Club workshops have come in, and things are changing a bit. This is because it is slowly stirring the imagination of the gamers as to what they can do besides playing. What I saw in the project when I got the invitation is that I wanted to diversify my audience rather than solely relying on the game, because after one hour the game gets boring”<sup>17</sup>.

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17 Interview conducted during the project

Furthermore, it is now clear for the owners of Lan Houses that Internet access is not enough, as this access must be qualified. From this perspective, access would be a starting point, not an arrival. Not only quality, but also the location of access has been a growing concern. According to the perceptions of Mario Brandão, owner of the Lan House Super X Rio and president of ABCID, the Brazilian Association of Digital Inclusion Centers, Mozilla workshops were the first he has ever seen operate with an audience aged under 18 years. This was mainly due to the methodology and the fact that the cell phone is too present in the life of the adolescents.

For him, “cell phone is a very present thing in their lives. I do not know if we can find someone to make an application, or have a story in the future of someone who is going to be successful, but the way of understanding the application, the way many people perceive the cell phone here has changed, and under a perspective that I consider correct. Because people no longer face the thing as a black box. It is not immutable. If the guy wants something different from

that, he does it. And you can do it. I even found some ideas interesting inside the last application workshop: one of the boys came up with an idea of a pet app that would connect dog owners to do joint activities. I searched the Internet and found nothing like it. This is all about market; ideas will arise, and I do not know what will come next. But the very fact that two people are thinking technology in a more palpable way is already rendering result”<sup>18</sup>. The three owners interviewed for this report consensually agreed that especially the younger audience received the workshops very well, above all thanks to the playful and game-oriented methodology of the workshops and to the handling of the mobile and of the application universe.

In this sense, the advancement of the information society has even affected this business model. For Naigel Wosny, owner of the establishment Matriz, in Santa Cruz, the Lan Houses as we once knew are over. “The purpose of the LAN House when it started does not exist

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18 Interview conducted during the project

anymore. It was to offer Internet access to a community where there was zero Internet. I had to make a project to bring the Internet from the center of the neighborhood to where my business is, because there was none. I installed an external antenna. I achieved this goal at the time, which was to bring to the community good quality access to the Web. Out of the 17 LAN Houses that existed in my surroundings, only three still exist, two and mine. I started with six computers, and today I own 20. I grew up because I supply high quality Internet, top quality games and service diversification, being access only one example”<sup>19</sup>.

### 3.3 Business diversification

As reported by Mário Brandão, owner of the Lan House Super X Rio, although many businesses closed down, those that remained ended up blending with the other existing Lan Houses, along with the purchase of more machines, the increment in improvements in services and the enlargement of the staff.

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19 Interview conducted during the project

**Above all, the statement that the key to survival was the diversification of the business is unanimous among the owners of Lan Houses heard.** Although Internet access remains essential, for many Lan owners, this is not the asset. Jecsandi Alves da Silva, 43, owner of Lan House KauMath, said: “I’ve had my Lan House for seven years. We have to kill one lion a day. Those who do not diversify shut down. Today, a Lan House owner cannot have the mentality of only renting machines for Internet use, because that fell long after the system of mobile phones, that of easier access to people. A Lan House owner has to come up with ideas. Food, beverages, technical assistance, printing, scanning, xerox, Internet access besides maintenance and repair services”<sup>20</sup>.

For Neigel, owner of Matriz, the workshops in his establishment were crowded because there is a lot of curiosity. “All the workshops here were packed. For each tool, people seemed to have a very large thirst to learn. One of the great successes

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20 Interview conducted during the project

was in the programming part; they passed the concept that anyone is able to make an application. Small cell phone programs. I think this has drawn a lot of attention not only in the practical term, but also in the concept that anyone can do, not just those who went to college”<sup>21</sup>.

### 3.4 Lan Houses as makerspaces

**The Rio Mozilla Club project, which intended to rethink the Lan Houses of the city of Rio de Janeiro with the goal of transforming them into *makerspaces*, unveiled that, in fact, even the owners of Lan Houses themselves barely know and explore this concept.** In the conversations, only two of them had heard about *makerspaces*, although the number increased when we spoke of 3D Printer. Jecsandi, the owner of the LAN House KauMath, told us that he first heard about *makerspace* quite recently as he had watched episodes of the Fab Lab series – Do It Yourself, broadcast in March

in “Fantástico”, a Sunday program at TV Globo.

According to the Massachusetts Institute of Technology (MIT) researcher and Fab Lab contributor Anna Waldman Brown, the most important consideration when thinking about community-based *maker* projects is whether that community really wants or would like a space like this. It is not enough just to provide the tools you need without any education plan, whereby people come to understand and know how to deploy those tools. For Anna, who is the author of one of the most extensive documents on the *Maker* movement in the world, a significant bottleneck of this type of project is physical space, usually the most expensive part of the whole equation. In this sense, she argues that taking advantage of the existing LAN Houses infrastructure sounds like a great idea, since there is already capillarity and, most importantly, a community built around the establishment, something very difficult to cultivate.

Another important factor is that not all

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21 Interview conducted during the project

LAN Houses are open or want to transform their business model. For Marcelo Pimenta, journalist and innovation designer at Laboratorium, it is clear that some LANs have more open-minded owners, who are fond of technology and have an entrepreneurial profile, whereas others are more conservative. Marcelo Pimenta also works as project coordinator in partnership with more than 200 LAN Houses, among which stands out the aforementioned Raio Brasil (whose aim was to support LAN Houses in the formalization and diversification of the business model ). All in all, as in any area, there are those who have more of a penchant for risks than others.

The research found that there is an explicit interest on the part of some LAN House owners to open up the news and to focus on public education and on a paradigm shift of the LAN House concept. Moreover, for all the experts consulted and based on the experience of other projects, the capillarity and territorialization of the LAN Houses, added to the fact that they already have a community around the enterprise,

are important differentials. We can also affirm that there is an enormous potential to stimulate creativity and innovation in Brazil by diversifying the type of enterprise that LAN Houses can become not only by means of broadening the offer of services, but also through the consolidation of their own essence as a space that promotes social innovation and citizenship.



# 4 LAN HOUSES AND THEIR POTENTIAL TO GENERATE INNOVATION

We equally conducted interviews with the users who participated on the project in order to understand the universe of Lan Houses in a global way and to know how they evaluated the experiences in the Rio Mozilla Club workshops<sup>22\*</sup>. We thereby approached them on how they felt and whether the pilot phase of the project influenced them. All interviewees had already had experiences in Lan Houses even before the project, were between 17 and 28 years of age, and had varying levels of familiarity with the use of computer and the Internet.

The interviews showed the perspective of the users of these spaces on the importance of these environments for their personal and professional development. In addition, they served to build an idea of what the workshops represented within that context and to reflect on the possibility of the use of the Internet as a tool for everyday problems in order to expand the concept of Lan Houses beyond a space for consumption of electronic games.

In this sense, as we will see below, the electronic games within these spaces are only the starting point to explore the potential of these environments. In addition to the fun they provide, they can also be a means for the attendants to achieve professional growth and to exert a leadership position in the group dynamics.

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22 \*All quotes indicated by quotation marks in this section refer to interviews conducted with the users of Lan Houses during the project.

## 4.1 From Games to new uses

Games at Lan Houses are omnipresent and, most of the time, the top attraction. Almost all respondents stated that they frequented Lan Houses for fun and to play – GTA, Crossfire, League of Legends and Mortal Kombat were some of the games cited.

**For many, the Internet is a window to the world, a resource used to create social bonds and to establish practical relationships in search of solving everyday problems. However, they perceive these benefits only later.**

People dedicate most of the time at Lan Houses to the consumption of games, as one participant puts it: “I kill time talking to my friends, playing League of Legends game (LoL), or any video game like Mortal Kombat X “. Even so, the interest in games generally goes beyond the sheer fun and the pastime they offer: “League of Legends is a strategy game, it’s a game that basically isn’t like the traditional games with the capitalist function and its need to put money into the game in

order to get stronger. The function of wasting money is optional, because you get strong thanks to your own effort. Everyone in every game starts with the same, you get strong during the game, that is, you have to learn to play with character X, get strong with him and keep playing. In order to get good, you get tips from professional players”.

Additionally, games induce other types of use, in other channels, with other resources, such as access to YouTube and to tutorials so that players “get tips” and improve, aiming at a continuous learning, in order to become an expert in the game, to learn with the professional gamers.

People perceive that the game is part of their personal and professional growth, and that any player can, in this sense, become a leader. For gamers, the game provides: “Logical reasoning, fast thinking. Often, you need to think and act, to move forward or not. You can set the direction of your team, the direction of the game. Sometimes an action, a decision, one thing that you click influences the game a lot... the guys

who have more vision are the ones who will excel, they are the ones who program everything and 'start' the game.  
=They are guys with a broad vision”.

Another participant highlights that he started getting interested in other channels and in the possibilities of Internet usage at Lan House. The idea was to create a Youtube channel about the Lan House “for entertainment even of the people who come here, the family, the friends. We will wait for the course to arrive at a stage at which we can actually do something on Youtube, as we are learning and want to put it into practice. “The idea sort of arose when he (Andre) was voting on the subject that he was going to pass in today’s class. We started talking about a possible channel on Youtube about Jec’s Lan House. We wanted the theme to be about games because people play a lot here at the Lan House. We wanted to do a different thing every week, such as games, comments on movie, things like that.

Besides content, the workshops also helped them apprehend the Internet and

all its opportunities: “I had my thoughts about the Internet, but when he spoke and showed all that, I realized that what I understand is not even one percent of what the Internet really is”. Participants described how the topics covered made them feel more empowered as others sought them to ask for advice and to pass something they have learned. They also felt more united and more collaborative by the simple fact that when one needed to be absent, another who learned would pass on the content.

## 4.2 Learning and creation hubs

The Mozilla Rio Club workshops caused different reflections on the participants. For some, they have brought new learning: “I have been training HTML to program what the site is going to do, to put the text that will be on the bottom, the image ... This is what I have to do in the final project of the college, and I learned more here as well” (when referring to Rio Mozilla Club). Additionally, the games had their share: “[I learned] to design

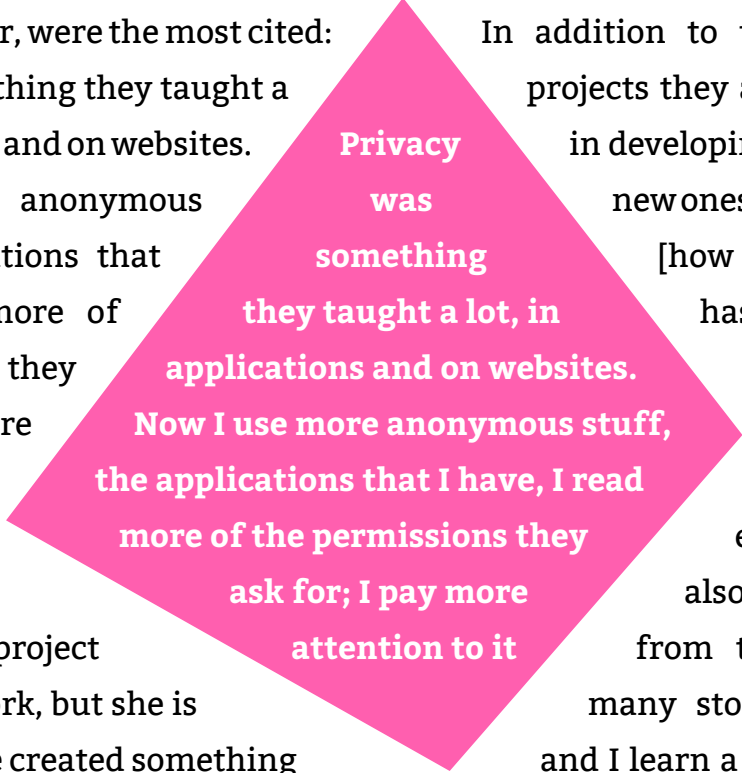
games. Have you already seen that game of a little blue kid? We developed it. Yeah, Mozilla also helped. I like Mozilla because we learn a lot. People are very nice.”

The issues of privacy and security, which they did not master, were the most cited: “Privacy was something they taught a lot, in applications and on websites. Now I use more anonymous stuff, the applications that I have, I read more of the permissions they ask for; I pay more attention to it”. She even set up a website for a final high school project – it was a group work, but she is very proud to have created something “from scratch”.

This initiative enables them able to develop more and better their activities: “I got on the Internet and I was navigating as I wanted. The phrase as I wanted, with the text of the color I wanted, the background as I wanted ...” The playful form causes them to respond in the same

way, in order to arouse their curiosity and their imagination: **“we create wings and will learn by digging, by moving forward alone, by asking colleagues and friends for help”**.

In addition to the content of the projects they already had interest in developing, they also learned new ones: “I cannot figure out [how many new things he has learned] because I’ve had class since last year, I do not remember everything. There are also other things apart from the class, they tell many stories of experiences, and I learn a lot from experience too”. It is important to emphasize new knowledge that has influenced personal and professional lives: “For example, my mother has a hard time messing with the Internet. Then she needs the name of a street. I did not know how to find it out before. Then I go there on Google Maps and find the street for her. I have learned all that thanks to Mozilla”.



In Lan House users' opinions, although the spaces may vary by owner, in general, parents who do not know a Lan House have a distorted view of the space and of their ability to perform. "The parents complain because they think that most Lan Houses do not preach education, so they think the child will learn something that is not good, do something they should not do. But if a Lan House has a person who knows how to act, with good character, I do not think they should complain. On many occasions, a parent came to talk to Jec that was deciding to leave his child there for the sake of confidence".

The role of the owner of the Lan House, in this sense, is fundamental: "Jec has the rules on the board. He does not allow people in uniform; you have to greet when you arrive and say goodbye when you leave. We always seek to comply with the rules in order to maintain the environment cool for everyone".

In the Lan Houses that participated in the project, which had already achieved a leadership position within the community, the attendants were

able to benefit from the workshops as to acquire knowledge that they did not have previously or to which they did not pay attention with regard to the way of using the Internet. One of them, for example, started to avoid programs that he considered less secure, and explained: "Telegram for example has open source, whereas Whatsapp has a closed code".

The debates and the content they learned eventually became knowledge, which encouraged and inspired them to develop new activities: "Now I want to create an application besides Youtube videos. I like Psychology, I have wanted to learn something called "hypnosis". I wanted to create an application to pass this kind of knowledge on to other people".

### 4.3 The user as maker

The feeling about being a *maker* varies among participants. Some have already shown great familiarity with the term: "**I am a maker, which means a person who makes things, who is a bit entrepreneurial, who is always looking**

**for something new to do, to undertake.”**

Others feel that “There is still a lot to learn. This field is too vast for you to suddenly consider yourself a *maker*.” When I come to understand a little more about programming, a little more about design, put it all together and start getting more active in the role of Mozilla helper, then I will come to consider myself a *maker*, but for now I am an apprentice.”

Other participants, in turn, only felt like a *maker* after being part of the workshops: **“From now on, yes, I feel like a maker, my way of seeing the Internet, the applications, I see everything with different eyes. So, André gave us a class about Internet security. There are a lot of apps, lots of websites that snoop around people, for example, Whatsapp, Facebook, they can get on your cell phone, tinker with photos, apps, turn on the camera, hang up, all that.”**<sup>23</sup>

Regardless of when they feel fit, they challenge to take the concept out of Lan

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23 Interview conducted during the Project.

Houses by understanding that there is a *maker* “inside” and “outside” the Internet. As one participant noted, “the Internet helps a lot, but also outside”. In this sense, the offline environment is important, because actors organize themselves based on this in order to inspire the development of the *maker* culture: “Out of those I remember now, I think a lot of my high school teachers are *makers*. I find it quite impressive, because I do not know if I would have the patience to do it. There are professors of mine who created companies, everything based on dreams. They had faith, studied, had guts and succeeded. The teacher who inspired me the most came out of the school now, he went to follow his path with a company that creates systems and sites”.

In this sense, when well integrated, these off and online environments render the system dynamic and fluid, in order to build an organic process of learning: “The *maker* is the person who is there, to promote and to teach, to help and to seek for learning too. Because there are some people who assimilate new things faster and perform certain functions with

ease, such as a friend of ours who, while everyone else broke one's head, solved the problem faster and went to help others. When you see someone performing an action, this can even lead you to learn more. When there is someone teaching, there is always someone learning"<sup>24</sup>. These healthy environments nurture the *makers*: "I want to create games, to create content, I'm very creative. I have a website, in which I also like to write. It's called 'nyah fan fiction', and it has a lot of people that write stories there. People write stories in it, and the site itself documents its history as your own. The site does not allow posts with the exact same content. Then they write some stories there, but it is more when there is nothing to do, because everything is pretty hectic".<sup>25</sup>

## 4.4 Spaces of socialization

As you can see, Lan Houses configure environments that somehow integrate

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24 Interview conducted during the Project.

25 Interview conducted during the Project.

the offline world to the online world. Most of the time, the people who go there are looking for the digital resources and services offered, but because there is a physical space, Lan Houses have the potential to extrapolate these functions: "When I was without a computer at home, my sister would come and bring me along, and here I am until today. I have befriended the folks and end up coming even without much reason".<sup>26</sup>

In addition to socialization, the participants feel they learn from new experiences and from people they know, as a participant points out: "It's nice to learn a lot of new things, to make friends with people who already have experience in this".<sup>27</sup>

Sociability is the key to understand not only the popularity that Lan Houses achieved in Brazil in the 2000s, but also to project the role that these spaces can play in society in the future. This society will live in the context of the New Industrial Revolution – the one that comes to transform the way

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26 Interview conducted during the Project.

27 Interview conducted during the Project.

we produce material goods, as we saw at the beginning of this document.

Thanks to their social character, Lan Houses have exercised (and exert) an importance that surpasses the access to the Internet, to the extent of becoming community spaces of coexistence. It is possible to imagine that now, with the right stimuli, they can do for the democratization of the *maker* culture what they did for digital inclusion in the past decades. In the same way that they facilitated the discovery of the web, they can facilitate the entrance of the citizens into the universes of the software, the hardware and the digital manufactures.

In spite of the focus on physical infrastructure when it comes to “*makerspace*”, national and international experiences reveal that the potential of these spaces lies in their capacity to form communities, to engage local agents, to connect them with one another and to understand the vocations and the demands of their locality.

NESTA carried out a mapping in the UK

in 2015<sup>28</sup> that shows that “socializing” is the main reason that leads someone to go to a *makerspace* (41%), followed by “learning” (35%) and “making” (33%). The study evaluated 97 spaces in England, Wales, Scotland and Northern Ireland.

The data demonstrates how the welcoming environment, the diversity of participants and the possibility of learning among peers constitute the tripod that supports this type of innovation space.

“I have learned working at Artisan’s Asylum [a reference *makerspace* in Boston, United States] that the most effective thing I could do for an arriving *maker* was to connect him/her to other *makers* who were developing similar projects. Way beyond what our team or I could offer, the most remarkable developments came from interactions with a dynamic and diverse network of people. My job was simply to enable and trigger these interactions, says Molly Rubenstein<sup>29</sup>,

28 Available at [http://www.nesta.org.uk/sites/default/files/open\\_dataset\\_of\\_uk\\_makerspaces\\_users\\_guide.pdf](http://www.nesta.org.uk/sites/default/files/open_dataset_of_uk_makerspaces_users_guide.pdf)

29 Available at <https://www.idin.org/blog-news-events/blog/>



coordinator of the International Development Innovation Network (IDIN). The network has 12 active social centers in developing countries such as Brazil, Kenya, Nepal and Uganda.

**The capillarity and involvement with the surrounding community are elements that allow us to imagine Lan Houses as community centers for the production of material goods, with a view to meeting a demand of the locality and generating new ventures.**

In the short term, they can also get impetus to fill training gaps by acting as informal learning spaces linked to the universe of new technologies. The possibilities include video production, music studio, software programming, electronics, robotics, 3D printing and other forms of digital manufacturing, as well as techniques and tools related to design and crafts already popular in the country, such as joinery, mechanics, electric and vinyl cutting.

# 5 FUTURE OPPORTUNITIES FOR BRAZILIAN LAN HOUSES

The experience of this first phase of Rio Mozilla Club allowed the project participants to try out the use of WebMaker tools in LAN houses in the outskirts of Rio de Janeiro and to conceive, through the activities suggested, the potential within these spaces for the promotion of the maker culture.

Based on this phase of project implementation and on the understanding of its challenges, we can perceive that there is space and opportunities for new editions of the project, in order to adapt it to the wishes and needs of the users of each space.

Furthermore, there is room for the project to promote the *maker* culture beyond the web: besides the activities already foreseen in the *Webmaker* methodology, it is possible to conceive offline creation activities in spaces other than Lan Houses (such as a carpentry of the neighborhood), in order to awake the creative side of each participant. Therefore, it is necessary to outline in advance some central characteristics of this universe that the project identified and that demand better consideration before the project even starts.

In the first place, it would be relevant to familiarize the actors of the project with the *maker* culture through the organization of exchanges between facilitators and owners of Lan Houses with regard to *makerspaces*, FabLabs and other spaces of the *maker* movement, in order to understand their functioning. Even so, in addition to the fact that the LAN Houses need a revisit, all the owners interviewed agreed that people show a latent curiosity and demand of for any novelty that appear in their respective communities.

An interesting point to mention is the recognition that the workshops obtained in order

to generate some kind of economy for the community when it comes to replacing a broken piece or doing some repair. In other words, it is a matter of a *makerspace*'s usefulness for a particular community.

As one participant says, "I have a LAN house in the suburbs. The information do not arrive fast, even because teenagers and young people do not give much importance to it. Even so, when there's something new around here, it always bursts. Even a different game, the person seeks it out of curiosity. These people have limitations, but at the same time, they are in search of something new. I believe that if some place puts this kind of thing some day and we can demonstrate how useful it is, there will be people wanting to use it. From what I understood of the report, everyone will welcome the cost reduction of each of those pieces, especially those who cannot afford what the market asks for. If you need a piece that costs two thousand Reais and some place offers the same piece for a thousand, this has a direct impact on people's lives"<sup>30</sup>.

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30 Interview conducted during the Project.

Mario Brandão, from LAN House Super X, had also heard about *makerspace* and, in interviews conducted by the Mozilla project, he said: "I do not imagine a 3D printer in every home, not in the short term. But if you have a space where eventually you need to produce a part, you go to a LAN and make it there. Since there is a pent-up demand for it, this becomes a niche business. Even if you need workforce to operate it, this will generate opportunity and creativity. Take, for instance, a kid who suddenly has an idea of making a different screwdriver and selling it in the vicinity or in the neighborhood. If someone buys it, he goes to a LAN, prints it and delivers it. It can be a way for people to capitalize by means of LANs and not just for them"<sup>31</sup>.

It is worth noting that the process of empowering users is complex. Above all, 'because it is difficult to say and know whether a person has been empowered or is empowered. According to the pedagogue that inspired the methodology of the project, Hélène

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31 Interview conducted during the Project.

Petry, it is “impossible for someone to empower another person”. Moreover, empowerment is not a constant thing, a person does not become empowered from one day to another, and this depends on the person. Therefore, empowerment is a long and unpredictable process.

Throughout the project, we have identified some behaviors and actions relevant to the empowerment process. Some people have acquired skills and knowledge, and ultimately developed applications for their lives, such as the participant who learned how to use a poster-making tool and applied what he learned to make a poster for his band. The willingness of some participants to customize the certificate delivered at the end of the workshops and to become facilitators of workshops in other Lan Houses is also revealing and may be an embryo of the *maker* culture. This shall be a further step in empowerment.

These insights have revealed, therefore, that despite the difficulties in measuring empowerment, it is important to think of the future of Lan Houses as community-

based spaces that convey social values. In this sense, the project served as a process of reviewing the role and performance of these spaces. Briefly, Lan Houses can:

- 1- Stimulate an entrepreneurial culture, in order to encourage communities to find solutions to their problems, thus increasing income and generating jobs;
- 2- Support small enterprises and local services;
- 3- Provide education and training in order to increase the employability and self-esteem of the populations of their environments;
- 4- Contribute to a sense of community, with the gathering of people of variable profiles.

## 5.1 Putting the technology into context

We must put our culture at the core of the process, so that these spaces of innovation gain relevance in the Brazilian context

and be protagonists in the New Industrial Revolution, presented at the beginning of this report. Which technologies would Brazilian society like to spur? Which techniques would have more adhesion? Which traits of our culture can these new practices enhance?

This is an ongoing debate in the world. The book *Maker City: A Practical Guide for Reinventing American Cities* points to valid questions for our latitudes as well: “The *maker* movement provides other lens for the future by answering the question: ‘How do we enable people to achieve all their potential and perform jobs that aggregate to society – and to leave routine and blaster work for robots?’” (HIRSCHBERG et al., 2017).

These responses inevitably go through experimentation and “trial and error” – practices that allow us to develop new paths, new techniques and new arrangements. In other words, **the success of Lan Houses as makerspaces also depends on their capacity to consolidate themselves as spaces linked to forms of production already**

**rooted in our culture, such as the logic of repairing and reusing materials.**

“The prospect of creative inventions through improvisation encourages a greater diversity of appropriations and concoctions from the exploitation of material indeterminations. The possibilities of creative uses of manufactured objects increase at the same proportion of the denial of closure and delimitation of their functions. More than replicating the industrial processes on a local scale, manufacturing technologies could indicate other forms of articulation between creativity and objects”, explains researcher Felipe Fonseca in an interview dated from August 2014 to the magazine *A Rede*<sup>32</sup>.

*Makerspaces* should stimulate experimentation and allow the development of inventions, with the emergence of new aesthetic languages, products for future commercialization, and even collective solutions to local

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32 Available at <http://www.revista.aredo.inf.br/site/edicao-n-99-julho-agosto-2014/7033-raitequi-fablabs-makerspaces-gambiarra-e-conserto>

problems. The articulation of the available knowledge and of the issues to be addressed is even more important to achieve this than the very physical infrastructure.

This does not mean that machinery is irrelevant in this context. The necessary resources, however, surpass digital tools. Components of electronics and robotics, common and abundant machinery in the Brazilian peripheries, such as hand tools, joinery equipment, sewing machines, vinyl adhesive machines, and electronic, mechanical and craft tools open a range of possibilities in prototyping and in the development of new products and services. Articulating this equipment and especially the abundant knowledge related to them and present in the popular territories is a way to encourage the *maker* culture in the country.

Will Holman, general manager of Open Works, a *makerspace* in the United States, explains in the article “*Makerspace: Towards a New Civic Infrastructure*,” published in the *Places Journal* in November 2015: “To realize their potential and become the centers

of a new cottage industrial revolution, *makerspaces* will need to adopt a more holistic approach. The movement will have to embrace spaces that feature both traditional and advanced fabrication tools at affordable prices; that provide not only for tooling but also for assembly; that offer wrap-around business services for *maker* enterprises, that develop *maker* education into a rigorous pedagogy; and that help build a sustainable market for *maker-made* goods and services”<sup>33</sup>.

The Innovation Center *Vila Nova Esperança* in São Paulo, a member of IDIN network, has been working since 2014 with the encouragement of the appropriation of new technologies based on simple materials and tools. In a small garage, the community developed projects such as the construction of orchid gardens with plastic bottles, a community radio, a homemade solar heater and a local connection network.

Albeit the undeniable potential of more traditional and analogue tools, expanding

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33 Available at <https://placesjournal.org/article/makerspace-towards-a-new-civic-infrastructure/>

access to emerging technologies such as digital manufacturing can help combat social inequalities arising from the incorporation of these new practices. When these technologies arrive at the same time in the peripheries and in the center, there is an attenuation of the unevenness of the widespread knowledge and an improvement of the opportunities relative to their uses.

This is even more significant once we consider the possible scenario of growth of social inequality stemming from the mechanization of work and the advancement of new technologies. In an article published in *Foreign Affairs* in 2014, Erik Brynjolfsson, Andrew McAfee and Michael Spence state: “Machines are substituting for more types of human labor than ever before. As they can replicate themselves, they are also creating more capital. This means that the real winners of the future will not be the providers of cheap labor or the owners of ordinary capital, both of whom will be increasingly squeezed by automation. Fortune will instead favor a third group: those who can innovate

and create new products, services and business models”<sup>34</sup>.

We need to conceive policies aimed at donating equipment in order to ensure that Lan Houses may obtain machinery that is still expensive and not very accessible in our country – as is the case of 3D printers, laser cutters and digital milling machines. This is an urgent need at this moment, as the demands for services resulting from the use of these machines are still incipient and unclear. In the future, when these demands grow along with the increase of profitability of such uses, it will be necessary to think of subsidy, loan policies and other entrepreneurial lines of development.

Another relevant point is to understand that the machines can be acquired ready or built with kits and prefabricated modules. The second option is associated with the “open source” culture and not only guarantees greater autonomy to the users of the tools, but also allows them to redefine, repair and improve those

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34 Available at <https://www.foreignaffairs.com/articles/united-states/2014-06-04/new-world-order>

tools. When building the equipment, you automatically create a community of assistance and support for the technology, which, throughout the process, learns about its operation and, in the future, guarantees its maintenance.

An additional key point to guide the technological choices of the *makerspaces* is to identify uses that have public adherence to the space. In the case of Lan Houses, the electronic games can be a guiding thread that motivates the production of games, the use of virtual reality and other layers of the audiovisual. In this way, we would have the engagement in the production and not only in the consumption of these technologies and, in the future, the Lan Houses could send forth talent to these industries.

## 5.2 For the sake of a sustainable revolution

GSMA (the Association of Mobile Industry Enterprises) and the United Nations University released a study in late 2015

<sup>35</sup> that warned that e-waste exceeded 40 million tons by 2014, and is still growing. Most of these wastes comprise small home appliances, television monitors and cell phones. During this period, Brazil alone produced 1.4 million tons of electronic waste, which means seven kilos per inhabitant.

In face of this scenario, it is easy to imagine why recycling, reuse and recovery are important drivers for policies linked to *makerspaces*. This is due both to the potential of these practices in dealing with important agendas of developing countries and to the opportunities they open in providing the materials and equipment that this type of activity needs.

Permaculture, bioconstruction, repair of electrical and electronic equipment and creative reuse are some of the practices that can be stimulated in the *makerspaces*. In addition to emboldening conscious consumption and reducing waste disposal, these activities raise curiosity about new objects and technologies.

<sup>35</sup> Available at <http://www.gsma.com/latinamerica/wp-content/uploads/2015/11/gsma-unu-ewaste2015-eng.pdf>



In the transition to a society that respects the natural resources of the planet, the possibilities linked to the *makerspaces* include agroecology, low-cost housing construction and decentralized energy production.

This type of activity may seem far from the simple connection to the Internet, which is more directly associated with the Lan Houses. However, access to tools, information and techniques is nothing more than the physical materialization of the broad knowledge linked to navigation, transits and discussions in these spaces.

Jay Silver, an MIT researcher and major *maker* in the US, says in an article published in Medium in 2015<sup>36</sup>: **“The maker movement as I understand it isn’t about robots or 3D Printing or STEM or even building things. It’s a**

**new Renaissance, post-industrial, that is led by each person and every person being fluent with the idea of meaning making, ethics, politics of technology, and conscientization”.**

## 5.3 Network spaces

The maker movement isn't about robots or 3D Printing or STEM or even building things. It's a new Renaissance (...) every person being fluent with the idea of meaning making, ethics, politics of technology, and conscientization

Much of the success of the *maker* culture is due to dialogue and networking. The effort for Lan Houses to integrate the chain made up of *makerspaces*, *fablabs* and *hackerspaces* should therefore include the encouragement towards open technologies – as is already the case in these other spaces. These practices extend the possibilities of exchanges, partnerships and re-readings of technology – let alone the gains of autonomy and flexibility in the assembly of equipment along with the decrease of maintenance costs.

We should also consider the

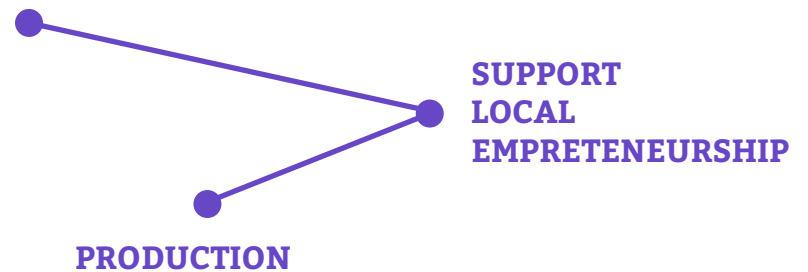
36 Available at <https://medium.com/@wakeupsilver/the-maker-movement-is-about-freedom-25ef8a323022#.lm4w8rhjk>

strengthening of cooperation among spaces, in order to boost local, national and global innovation ecosystems. The policy announced in 2014 in the United States is an example of prompting dialogue among agents of varying weight and nature in the public sector, the private sector and the civil society. With the motto “Today’s ‘Do It Yourself’ is Tomorrow’s ‘Made in America’”, former President Obama galvanized new technologies and rapid prototyping in schools; the transformation of libraries into *makerspaces*; the support for incubators with regard to hardware projects; technical cooperation among collectives without formal institutions or groups; investment in research in related areas; the connection between large companies and small entrepreneurs; the channels dedicated to the *maker* universe on the platforms of collective financing; small-scale local production; software distribution; the existing spaces and their connection with large corporations and public agencies.

The promotion of a broader debate on public policy agendas involving

Lan Houses, other *makerspaces* and innovation spaces in cities will create opportunities for each space to articulate the intelligences available in its surroundings and support its users in their inventions. In this way, Lan Houses will tread a path that begins with spaces of formation, evolves to support the local enterprises and, in the future, culminates in spaces of production while incorporating new dimensions, but without abandoning the previous ones.

**LEARNING**



“The New Revolution presupposes literacy in dealing with inventions, which means that it is not a literacy of communicating ideas using words or abstractions, such as mathematics. It is a new type of literacy. We will create the future with our own hands and not talking about ideas. (...) Literacy of the invention is literacy of the 21st Century. More than computer programming or

Maths, it is about the ability to recreate our existence”<sup>37</sup>, explains Jay Silver in a video interview published in the Spanish newspaper *El País*.

Therefore, it is through access to these new ways of doing and interacting with the environment that we can offer tools so that more citizens are able to fight for their rights in the so-called New Industrial Revolution. Lan Houses have the potential to be, once again, catalysts of this inclusion by maintaining their vocation of community articulation as spaces of learning and of collective production, in order to re-signify their importance as centers of access to knowledge and of socialization.

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37 Available at <https://youtu.be/CXhQMhJ4KAA>

# CON- CLU- SION

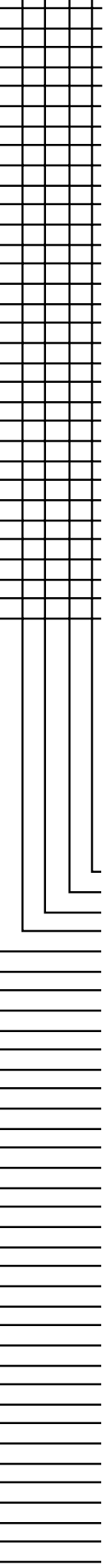
**The Internet culture has brought about profound changes to modern society by connecting all people in a large network that promotes social and economic interaction at the global level. Access to this infrastructure first allowed the spread of information on a large scale, which transformed the way we produce and exchange knowledge.**

In the private sector, it initially affected the most the communication and the entertainment industries. Notwithstanding, the rapid advancement of this technology and the evolution of the tools and devices that came with it usher a new stage in this revolution. We have witnessed the emergence of new industries and the development of sectors that go beyond digital boundaries and therefore allow all people to create their own products.

The *maker* movement comes to the fore of these transformations, based on the idea that we can all create, produce and modify the most diverse types of products, with access to the tools that render this process possible. Electronics and robotics, 3D printers and the creative economy are just a few of its exponents that, along with the hacker culture, related to free access and knowledge sharing, have revolutionized the

way we consume and produce our personal objects. The phenomenon is still recent, though it comes as no surprise that the rumors surrounding it are increasing. It is the product of a disruptive and highly innovative economy, and thus has the potential to change an entire market logic, based on the private ownership of means of production.

This new economic culture bears concepts such as doing, sharing and learning, and encourages the spread of access, with rapid dissemination around the world thanks to several of its most conspicuous educational centers. FabLab, one of the first *makerspaces* to emerge in the United States, was part of MIT, the Massachusetts Institute of Technology. Today, a large network of FabLabs has established itself around the world, which provides and disseminates the tools and knowledge necessary for anyone to be able to produce whatever one wants.



In Brazil, the movement has also heeded more and more attention. The *maker* culture is an opportunity for small entrepreneurs as much as it empowers citizens and bolsters innovation. Additionally, it is already the focus of important public policies in some Brazilian cities. It has equally gained credibility within academic institutions and private companies that launch their own spaces, which often become incubators. Rio Mozilla Club is another important effort to foster this culture within Brazil.

The project used Lan Houses as a space for digital empowerment, and culture as a movement for social and economic empowerment. The idea was to transform spaces that now provide infrastructure into ones aimed at cultural construction by means of the appropriation of this infrastructure. In order to achieve this, the project carried out a series of educational activities besides the mobilization of networks of citizens in each community. A variety of meetings and workshops have demonstrated the prominence of Lan Houses as centers of diffusion of technology and the potential of these spaces to advance innovation and to translate a sense of community. More than that, Rio Mozilla Club exposed the need to revitalize the universe of Lan Houses, given its importance for the dissemination of digital culture, at the same time it

demonstrated us the relevance of the *maker* culture beyond these spaces.

The experience was revealing in bringing the users of Lan Houses closer to an emerging culture with which they still had no contact, which generated not only a feeling in the participants of belonging and of personal growth, but also local innovation aimed at the development of their projects. This synergy is beneficial and fundamental to the country. At the same time, we must draw attention to the concentration of this type of project only in Lan Houses and in lower income communities. If this localized initiative alone has already produced so many fruits, can you imagine the results once it expands to places and spaces with more resources and integrates different users?

In this sense, the Rio Mozilla Club project is a sheer success not only for generating value in economically less favored regions of Rio de Janeiro, but also for unveiling the potential of this nascent culture in Brazil. What is important now is to follow up this development in order to foster it within public and private initiatives aimed at its dissemination as a form of social integration and as an opportunity for economic growth.

# Bibliography

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HIRSHBERG, Peter; DOUGHERTY, Dale; KADANOFF, Marcia. **Maker City: A Practical Guide for Reinventing American Cities**. Maker Media: Canada, 2017.

LEMOS, Ronaldo; FERRAZ, Joana (org.). **Pontos de Cultura e Lan Houses: estruturas para inovação na base da pirâmide social**. Rio de Janeiro: Escola de Direito do Rio de Janeiro da Fundação Getúlio Vargas, 2011.