LIFT: a social ecosystem of financial and technological innovations

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ABSTRACT

LIFT is an ecosystem that aims to develop innovation within the Brazilian financial industry. In the form of a descriptive report, this paper presents the LIFT experience, its history and structure. Based on the technological readiness levels (TRL), LIFT resulted in a significant increase in competitiveness in the National Financial System and the offering of new products and services by means of sixty (60) Fintechs which arose from it. Due to its characteristics and modus operandi, it can be concluded that LIFT is a social business: its objectives are oriented towards serving a community; the ecosystem has independent management and a democratic decision-making process, focusing on the engagement of people and effectiveness in the contribution of work and the lack of income distribution. Its educational character results from the practical application of technologies in sharing knowledge between participants, causing a learning model very similar to that described by Vygotsky (2007) as “Zone of Proximal Development”.

Keywords: innovation; innovation laboratory; national financial system.

INTRODUCTION

In 2018, the Central Bank of Brazil (BCB) structured the Financial and Technological Innovations Laboratory (LIFT) as an innovation ecosystem, bringing together agents of society, experts from the financial industry and experts in Information and Communications Technology, for voluntary participation in projects that would result in innovative impacts on the Brazilian financial industry. The intention was to reduce operational costs, create technological alternatives and explore new business models that could make financial transactions in Brazil more efficient and less expensive.

The LIFT ecosystem, coordinated by the BCB and the National Federation of Associations of Central Bank Servants (FENASBAC), was created as an initiative to support the development of financial or technological innovation projects to be carried out in a fully virtual environment, with the support of large technology companies that operate as LIFT’s technological partners, and that within a period of three months can present functional prototypes and problem resolution that affect Brazil’s National Financial System (SFN).

The model has a unique proximity to the concept of social business (Borzaga; Defourny, 2004) and is strongly oriented towards education, although differentiated from formal processes.

The LIFT ecosystem consists of: (a) an innovation laboratory, LIFT LAB; (b) an education program, LIFT LEARNING; (c) a specialized challenge environment, LIFT CHALLENGE; (d) a program for disseminating innovation concepts, LIFT TALKS; (e) a journal specialized in financial and technological innovations, LIFT PAPERSS; and (f) a specialized event to present laboratory results to the market, called LIFT DAY.

In this paper, we will present LIFT as a social business, which created an ecosystem of financial and technological innovations for the National Financial System and the educational impact on society.

SOCIAL BUSINESS: A CHARACTERIZATION

In 2015, an interesting study on the evolution of the tertiary sector was presented in the Interdisciplinary Journal for Social Management of the School of Administration of UFBA, Universidade Federal da Bahia (Oliveira; Godói-de-Sousa, 2015). In article "O terceiro setor no brasil: avanços, retrocessos e desafios para as organizações sociais", Eider Oliveira and Edileusa Godói-de-Sousa present an overview of the emergence and development of the tertiary sector concept in Brazil (Oliveira; Godói-de-Sousa, 2015). The authors carefully evaluate the establishment of the legal structure, the terms employed and the different philosophical conceptions that underlie the so-called Civil Society Organizations (CSOs), such as Non-Governmental Organizations (NGOs), Tertiary Sector Organizations, Private Foundations and Non-Profit Associations (FASFIL), and Civil Society Organizations of Public Interest (OSCIPs), etc. (Oliveira; Godói-de-Sousa, 2015). It should be highlighted that, in 2022, the non-profit Civil Society will no longer be part of the designation of legal entities governed by private law in Brazil, and must be classified as foundations, societies or associations or religious organizations (Brasil, 2002).

The concept of economic sector that is distinct from the State and which has non-profit purposes appears at different times in history (religious societies, educational societies, etc.), but it was only at the end of the 19th century that the idea of a non-profit sector began to take institutional form and define itself both to complement the State's social action and to meet public needs not covered by it.

The discussion about social business, however, has grown throughout the world with the use of different terms, in addition to those mentioned by Eider Oliveira and Edileusa Godói-de-Sousa (2015). For a comprehensive assessment of the topic, one must analyze some relevant concepts surrounding the subject. Which is what we delved into.

SOCIAL BUSINESS, SOCIAL ENTERPRISE AND NON-PROFIT ORGANIZATIONS

Borzaga and Defourny (2004) present, in Emergence of Social Enterprise, an assessment of the so-called tertiary sector, viewing it as socioeconomic initiatives that do not belong either to the traditional for-profit private sector or to the public sector (institutions of the State). The authors understand that these initiatives often stem from voluntary organizations and operate under a wide variety of legal frameworks. They understand that such institutions represent a renewed expression of Civil Society in a context of economic crisis, weakening of social ties and difficulties for the State to take care of the well-being of its citizens.

In the aforementioned study, Borzaga and Defourny (2004) understand that the emergence of a social economy has been characterized by having a redistributive role by means of the provision of a wide range of services (free or virtually free) through voluntary contributions (in cash or through voluntary work). They understand that this sector is also involved in the regulation of economic life when, for example, social associations or cooperatives are partners with public authorities in the task of reintegrating low-skilled unemployed people into work, at risk of permanent exclusion from the labor market. They justify the emergence of social economies on account of the persistence of structural unemployment in many countries, the need to reduce State budget deficits, the difficulties of traditional social policies and the need for more active integration policies.

For Marthe Nyssens (2007), social enterprise is seen as an innovative response to the funding problems of non-profit organizations, which are finding it increasingly difficult to request private donations and government and foundation subsidies. The concept is also used to highlight the innovative side of certain types of projects, as well as the financial risks they are taking. It is expected that the qualities normally attributed to the private sector (flexibility, speed, creativity, willingness to undertake responsibilities, etc.) can be incorporated into the actions of social enterprises so that they produce improvements in the services provided to society.

Borzaga and Defourny (2004) understand that the emergence of social businesses indicates a change in the political model, of social responsibility shared between public authorities, for-profit providers and tertiary sector organizations, based on strict criteria of efficiency and equity. The authors (Borzaga; Defourny, 2004) point to a growing number of economic initiatives in Europe with peculiar characteristics and which they call ‘social enterprises’, understood

> [...] como novas entidades que podem ser consideradas como uma subdivisão do terceiro setor, mas também estabelecem um processo, um novo espírito empresarial (social) que retoma e remodela experiências anteriores. (Borzaga; Defourny, 2004, p. 2, our translation)[1].

[1] Original: “[...] new entities which may be regarded as a sub-division of the tertiary sector, but they also set out a process, a new (social) enterprise spirit which takes up and re-fashions older experiences.” (Borzaga; Defourny, 2004, p. 2).

In the late 1960s, worker cooperatives and so-called 'labor-managed enterprises' entered the heart of neoclassical economics and gave rise to a widely respected theoretical and empirical corpus (Borzaga; Defourny, 2004).

> Em outras disciplinas, como a sociologia, muita pesquisa sobre organizações voluntárias foi realizada desde meados do século. [...] [A] ideia de um 'terceiro setor' distinto, composto pela maioria das empresas e organizações que não visam principalmente o lucro e que não fazem parte do setor público, realmente começou a surgir em meados dos anos 1970 (Borzaga; Defourny, 2004, p. 3, tradução nossa)[2].

Thus, according to Borzaga and Defourny (2004, p. 4, our translation)[3],

> [...] [P]ode-se dizer que duas abordagens teóricas sobre o terceiro setor gradualmente se difundiram internacionalmente, acompanhadas de trabalhos estatísticos que visam quantificar sua importância econômica. Uma delas é a abordagem do 'setor sem fins lucrativos' [...] e a outra [...] forjou o conceito de 'economia social' ao reunir cooperativas, sociedades mútuas, [fundações] e associações [como entidades ativas na Sociedade Civil].

Historically, a tripolar approach was common, which established economic agents separated into three poles: private initiative, State and others. From this perspective, the tertiary sector is understood as a space of public and private arrangements considering its purposes and work methods.

According to Borzaga and Defourny, "[d]evido à sua flexibilidade, tais abordagens podem ajudar a conciliar as noções de setor 'sem fins lucrativos' e 'economia social' [...]".(2004, p. 4, our translation)[4]

On the one hand, there is the concept of social economy, defined on the basis of its legal-institutional characteristics or the principles that its organizations have in common. In most industrialized countries, tertiary sector companies and organizations can be grouped into three main categories: cooperative enterprises, mutual societies and those organizations that can generally be described as associations or foundations, the legal nature of which can vary considerably from one country to another.

The second way of seeing the social economy is to emphasize the principles that its organizations have in common. It is an approach that aims to identify criteria that can characterize entities belonging to the tertiary sector.

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[2] Original: "In other fields, like sociology, a lot of research on voluntary organisations has been undertaken since the middle of the century. […] [T]he idea of a distinct "tertiary sector", made up of most enterprises and organisations which are not priorily seeking profit nor are part of the public sector, really began to emerge in the mid 70s." (Borzaga; Defourny, 2004, p. 3).

[3] Original: "[…] [i]t may be said that two theoretical approaches to the tertiary sector gradually spread internationally, accompanied by statistical work aimed at quantifying its economic importance. One approach is the "non-profit sector" [...] the other [...] forged the concept of the "social economy" to bring together co-operatives, mutual societies and associations [...]" (Borzaga; Defourny, 2004, p. 4).

[4] Original: "[B]ecause of their flexibility such approaches can help to reconcile the notions of "non-profit sector" and "social economy" [...]" (Borzaga; Defourny, 2004, p. 4).

Here, the study by Borzaga and Defourny (2004, p. 7, our translation)[5] identifies the following characteristics for social businesses: “o objetivo de servir os membros ou a comunidade, em vez de gerar lucro; uma gestão independente; um processo democrático de tomada de decisão; a primazia das pessoas e do trabalho sobre o capital na distribuição da renda”.

The non-profit character is characterized by the emphasis on the fact that activities carried out in the social economy provide a service to members or a wider community and do not have the primary objective of obtaining a financial return on investment, although the generation of surplus may be the result of the provision of services or a way to improve them, but the fact that this is not the main motivation for the activity is decisive.

The independence of its management model is one of the main means of distinguishing a social economy entity from public entities, which are always subject to specific rules.

The presence of a democratic decision-making process is expressed in the concept that each participating member has the right to one vote, thus avoiding governance privileges for agents with greater financial capacity.

In 1990, a conceptual framework on the social economy emerged with the development of a vast international study coordinated by the *American Johns Hopkins University* (Borzaga; Defourny, 2004). According to Borzaga and Defourny (2004, p. 9, our translation)[6]

> “[o]s investigadores envolvidos neste projeto [caracterizaram] o setor sem fins lucrativos como constituído por organizações com as seguintes características:
>
> - são formais, ou seja, têm um certo grau de institucionalização, o que pressupõe geralmente personalidade jurídica;
> - são privados, ou seja, distintos tanto do Estado quanto das organizações que emanam diretamente do poder público;
> - são autônomos, no sentido de que devem ter os seus próprios regulamentos e órgãos de decisão;
> - não podem distribuir lucros para seus membros, seus diretores ou um conjunto de ‘proprietários’. Essa ‘restrição de não distribuição’ está no cerne de toda a literatura sobre organizações sem fins lucrativos; e
> - devem envolver algum nível de contribuição voluntária em tempo (voluntários) e/ou em dinheiro (doadores), e devem ser fundamentados na filiação livre e voluntária de seus membros.

[5] Original “- the aim of serving members or the community, rather than generating profit; - independent management; - a democratic decision making process; - the primacy of people and labour over capital in the distribution of income.” (Borzaga; Defourny, 2004, p. 7).

[6] Original: “For all the researchers involved in this project, the non-profit sector consists of organisations with the following characteristics:
- they are formal, i.e. they have a certain degree of institutionalisation, which generally presupposes legal personality;
- they are private, i.e. distinct from both the State and those organisations issuing directly from the public authorities;
- they are self-governing, in the sense that they must have their own regulations and decision making bodies;
- they cannot distribute profits to either their members, their directors or a set of “owners”. This “non-distribution constraint” lies at the heart of all the literature on NPOs;
- they must involve some level of voluntary contribution in time (volunteers) and/or in money (donors), and they must be founded on the free and voluntary affiliation of their members.” (Borzaga; Defourny, 2004, p. 9).

NON-PROFIT SECTOR AND THE SOCIAL ECONOMY

It can be said that "[...] tanto o setor sem fins lucrativos quanto a economia social são definidos em termos de sua estrutura básica e regras organizacionais, e não em termos de suas fontes de receita" (Borzaga; Defourny, 2004, p. 10, tradução nossa)[7]. There are three areas of divergence: "a especificação de metas; o controle sobre a organização; e o uso de lucros" (Borzaga; Defourny, 2004, p. 10, tradução nossa)[8].

Regarding the definition of goals, social economy organizations establish very clearly that the main purpose of the organization is "servir os membros ou a comunidade, em vez de buscar o lucro. [...] Já as organizações sem fins lucrativos (OSFL) não deixam isso bem estabelecido (Borzaga; Defourny, 2004, p. 10, tradução nossa)[9], making it possible to generate profits as long as they are not distributed to owners and managers.

Regarding control over the organization, the entities of the

> [...] economia social têm no seu cerne a exigência de um processo democrático de tomada de decisão que, para além de conferir peso à participação e voz efetiva dos membros, representa um procedimento estrutural para controlar a persecução efetiva dos objetivos da organização. Por sua vez, nas OSFL, tal controle vem de dentro da organização através de seus órgãos internos, mas sem qualquer exigência democrática formal [ou caracterização específica de participação] (Borzaga; Defourny, 2004, p. 10, tradução nossa)[10].

Finally, regarding the use of profits, we have that in "[...] abordagem sem fins lucrativos as organizações proíbem qualquer distribuição de lucro [...]" (Borzaga; Defourny, 2004, p. 11, tradução nossa)[11] , this being the conceptual basis of the non-profit approach. This non-distribution restriction gives them particular relevance as public benefit corporations. On the other hand, social economy organizations place more emphasis on organizations of mutual interest, being able to use profit as long as they maintain a model of democratic participation in the objectives and operation of the organization, as in the case of cooperatives and associations (Borzaga; Defourny , 2004).

SOCIAL ENTREPRENEURS

From the concept of social economy, it is possible to develop the idea of social enterprise.

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[7] Original: "[...] it should be stressed that both the non-profit sector and the social economy are defined in terms of their basic structure and organisational rules rather than in terms of their sources of revenue." (Borzaga; Defourny, 2004, p. 10).

[8] Original: "- the specification of goals, - the control over the organisation and - the use of profits." (Borzaga; Defourny, 2004, p. 10).

[9] Original: "to serve members or the community rather than to seek profit. [...] the NPO approach does not say anything explicit as to the goals of the organisation." (Borzaga; Defourny, 2004, p. 10).

[10] Original: "[...] the social economy has at its heart the requirement of a democratic decision- making process which, in addition to giving weight to actual members' involvement and voice, represents a structural procedure to control the actual pursuit of the organisation's goals. In the NPO approach, such a control also comes from inside the organisation through its governing bodies but without any formal democratic requirement." (Borzaga; Defourny, 2004, p. 10).

[11] Original: "[...] the non-profit approach prohibits any profit distribution [...]" (Borzaga; Defourny, 2004, p. 11).

> Os empreendedores sociais não são, necessariamente, proprietários de uma empresa, mas se caracterizam por introduzir mudanças em pelo menos uma das seguintes formas: a introdução de um novo produto ou uma nova qualidade de produto, a introdução de um novo método de produção, a abertura de um novo mercado, a aquisição de uma nova fonte de matérias-primas; ou a reorganização de um setor de atividade. (Borzaga; Defourny, 2004, p. 13, tradução nossa)[12].

As a result of this modus operandi in the economy, innovation is introduced able to generate (Borzaga; Defourny, 2004):

- new factors of production;
- new market relations; and
- new types of companies.

In particular, we can identify a new social entrepreneurship when it is possible to identify (Borzaga; Defourny, 2004):

- the social purposes of the activity;
- the use of non-commercial resources; and
- organizational methods suitable for the business model.

Social enterprises are created voluntarily by a group of people and are managed by them as part of an autonomous project. Borzaga and Defourny (2004) affirm that some characteristics are essential to define social enterprises:

- a significant level of economic risk;
- the internal assumption, totally or partially, of the risks of the initiative; and
- a minimum amount of paid work.

In turn, one must assess that social enterprises are also characterized by (Borzaga; Defourny, 2004):

- an explicit purpose to benefit the community;
- an initiative developed by a group of citizens;
- a decision-making power not based on capital ownership;
- a participatory nature, which involves people affected by the activity; and
- limited profit distribution, if any.

Social enterprises are seen as an innovative response to the funding problems of non-profit organizations, which are finding it increasingly difficult to obtain private donations and government and foundation subsidies (Nyssens, 2007).

[12] Original: “Entrepreneurs are not necessarily the owners of a company, but they are responsible for introducing changes in at least one of the following ways: the introduction of a new product or a new quality of product, the introduction of a new production method, the opening of a new market, the acquisition of a new source of raw materials or the reorganisation of a sector of activity.” (Borzaga; Defourny, 2004, p. 13).

Still in *Social enterprise at the crossroads of market, public policy and civil society*, it is possible to identify two schools of thought on social entrepreneurship (Nyssens, 2007):

one school of thought emphasizes the dynamics of social entrepreneurship, exemplified by companies that seek to increase the social impact of their productive activities; and

another current uses the concept of social enterprise only for organizations belonging to the tertiary sector and, therefore, takes advantage of the specificities of the latter. In such social enterprises, usually non-profits or cooperatives, the social impact on the community is not just a consequence or a side effect of the economic activity, but its very motivation.

Social enterprises have been defined as organizations with the explicit purpose of benefiting the community, initiated by a group of citizens and in which the material interest of capital investors is subject to limits. They also highly value their autonomy and the assumption of economic risks related to ongoing socioeconomic activity.

THE FINANCIAL AND TECHNOLOGICAL INNOVATIONS LABORATORY (LIFT)

Technological and financial innovation has the power to increase access, convenience and reduce costs for consumers, but it can also cause negative impacts on the market – including potential risks to systemic stability. Upon recognizing the need to monitor the evolution of innovation and its social impact, the BCB took the initiative to create an institutional instrument that would allow the development of an innovation ecosystem; contribute to education for innovation and, at the same time, prudently observe the impacts on society in general and on the Financial System in particular (Siqueira *et al*., 2019).

LIFT emerged as a private social business arrangement considering the following characteristics:“o objetivo de servir a uma comunidade, em vez de gerar lucro; um modelo de gestão independente; um processo democrático de tomada de decisão; a primazia das pessoas e do trabalho e a inexistência de distribuição da renda” (Borzaga; Defourny, 2004, p. 7, tradução nossa)[13].

In addition, it is characterized as a social enterprise to the extent that it:

- has explicit purposes to benefit society;
- is an initiative developed by a group of citizens;
- has a decision model not based on capital ownership; and
- has a participatory nature, involving people affected by the activity.

We now analyze its structure, operation and results.

[13] Original: “the aim of serving members or the community, rather than generating profit; independent management; a democratic decision making process; the primacy of people and labour over capital in the distribution of income.” (Borzaga; Defourny, 2004, p. 7).

LIFT OPERATING AGENTS

THE CENTRAL BANK OF BRAZIL

BCB is one of the LIFT managers. It is a public institution that

> [...] foi criada pela Lei 4.595, de 31 de dezembro de 1964. É o [...] responsável por garantir o poder de compra da moeda nacional, tendo por objetivos: zelar pela adequada liquidez da economia; manter as reservas internacionais em nível adequado; estimular a formação de poupança; zelar pela estabilidade e promover o permanente aperfeiçoamento do sistema financeiro. [A instituição contempla em] suas atribuições [...]: emitir papel-moeda e moeda metálica; executar os serviços do meio circulante; receber recolhimentos compulsórios e voluntários das instituições financeiras e bancárias; realizar operações de redesconto e empréstimo às instituições financeiras; regular a execução dos serviços de compensação de cheques e outros papéis; efetuar operações de compra e venda de títulos públicos federais; exercer o controle de crédito; exercer a fiscalização das instituições financeiras; autorizar o funcionamento das instituições financeiras; estabelecer as condições para o exercício de quaisquer cargos de direção nas instituições financeiras; vigiar a interferência de outras empresas nos mercados financeiros e de capitais; e controlar o fluxo de capitais estrangeiros no país. Sua sede fica em Brasília, capital do País, e tem representações nas capitais dos Estados do Rio Grande do Sul, Paraná, São Paulo, Rio de Janeiro, Minas Gerais, Bahia, Pernambuco, Ceará e Pará. (Banco Central do Brasil, [201?], *online*)[14].

As Brazil's financial authority, the BCB's institutional mission is "garantir a estabilidade do poder de compra da moeda, zelar por um sistema financeiro sólido, eficiente e competitivo, e fomentar o bem-estar econômico da sociedade" (Sandbox [...], [201?], *online*)[15]. Within its strategic perspectives is the view of "ser reconhecido pela promoção da inclusão, transparência, sustentabilidade e competitividade no sistema financeiro e pelo estímulo à educação financeira do cidadão" (Planejamento [...], [202?], *online*)[16].

THE NATIONAL FEDERATION OF ASSOCIATIONS OF CENTRAL BANK SERVANTS

LIFT emerged from a technical cooperation agreement between the BCB and FENASBAC. It was characterized as a work plan to create and develop an ecosystem to encourage innovation in the Brazilian financial system.

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[14] Translation: "[...] was created by Law 4,595, of December 31, 1964. It is [...] responsible for guaranteeing the purchasing power of the national currency, with the following objectives: ensuring adequate liquidity in the economy; maintaining international reserves at an adequate level; encouraging the formation of savings; ensuring stability and promoting the ongoing improvement of the financial system. [The institution includes] duties such as [...]: issuing paper money and metallic money; performing currency services; receiving compulsory and voluntary payments from financial and banking institutions; carrying out rediscount and loan operations to financial institutions; regulating the execution of services regarding the clearance of checks and other papers; carrying out purchase and sale operations of federal public securities; exercising credit control; supervising financial institutions; authorizing the operation of financial institutions; establishing the conditions for holding any management positions in financial institutions; monitoring interference by other companies in financial and capital markets; and controling the foreign capital flow into the country. Its headquarters are in Brasília, the capital of the country, and has representation in the capitals of the states of Rio Grande do Sul, Paraná, São Paulo, Rio de Janeiro, Minas Gerais, Bahia, Pernambuco, Ceará and Pará." (Banco Central do Brasil, [201?], online, editorial translation).

[15] Translation: "ensuring the stability of the purchasing power of currency, ensuring a solid, efficient and competitive financial system, and promoting the economic well-being of society " (Sandbox [...], [201 ?], online, editorial translation).

[16] Translation: "being recognized for promoting inclusion, transparency, sustainability and competitiveness in the financial system and for encouraging citizens' financial education" (Planejamento [...], [202?], online, editorial translation).

FENASBAC is a non-profit civil association the aims of which are, among others, the preparation, promotion, sponsorship and holding of events of a technical, cultural or social nature aimed at the community; studies, research, consultancy, advice and training, related to its own activities, to those of the BCB or to those of others of relevant interest to society, such as innovation and technology. It is constituted from a Board of Directors, a Management Council, an Executive Board and an Audit Committee. FENASBAC shares coordination, together with the BCB, acting in all stages of the LIFT operation (Siqueira *et al.*, 2019).

TECHNOLOGY PARTNERS AND FUNDING AGENCIES

Before each edition of LIFT takes place, there is a call for voluntary participation from technology partners and funding agencies. The partners offer the proponents of innovation projects, originating from Civil Society, products and services using their respective technologies, for a defined period and at no cost, with the strict purpose of promoting the technological development of new business models proposed as financial or technological innovations. They also monitor LIFT development activities and participate in the development of innovation projects. Funding agencies generally participate in LIFT LEARNING editions together with the academia and to fund research grants for students and researchers involved in the educational projects that LIFT LEARNING develops.

Technology partners operate in the LIFT ecosystem by offering technology products and services that are chosen by the innovation project proponents, with the exception of LIFT CHALLENGE, in which case project proponents must be responsible for their own infrastructure solutions, products and technological services.

PROPONENTS OF INNOVATION PROJECTS

With each edition of LIFT LAB, LIFT LEARNING and LIFT CHALLENGE, applications are opened for the proposition of innovation projects, the details of which will be described below. Those who apply in each edition, called innovation project proponents, must submit an innovation idea, justify its importance for the National Financial System and present, in general terms, the main contributions that they should make to society. The projects go through a selection process, and the selected proponents participate in different stages of development together with the BCB, FENASBAC and, as appropriate, technology partners.

HISTORY AND DEVELOPMENT OF LIFT

An innovation study (Bound; Mulgan, 2019) by "*Nesta*"[17] was appreciated by the LIFT founding team. A model for encouraging innovation called Regulatory Anticipation, whose characteristics were decisive for the creation of LIFT was found in the material.

[17] Site: https://www.nesta.org.uk/.

Regulatory practices that reshape the role of regulation in supporting innovation characterize new approaches, such as the regulatory *sandbox* and the sectoral *sandbox*. The effort to change the theory and practice of regulation gives rise to a model of innovation that is now referred to as "anticipatory regulation", which essentially provides a set of behaviors and tools that aim to help regulators and governments identify, build and test solutions to emerging challenges in certain markets and are characterized by interaction between regulators and innovators and, in some cases, active public involvement.

LIFT emerged in 2018 as an experiment in anticipated regulation and was characterized as a sectoral *sandbox* , different from the regulatory *sandbox* : a community initiative involved/interested in financial innovation with the purpose of supporting the development and testing of functional prototypes of innovative solutions with the potential to affect the financial industry. Unlike the so-called regulatory *sandbox* – the BCB has another one for a regulatory *sandbox* (Banco Central do Brasil, 2020) – the sectoral *sandbox* do not allow any regulatory exemption. The Laboratory initially emerged with the aim of developing innovation initiatives for the financial system.

In Brazil, in 2018, there was a profusion of initiatives that encouraged the development of prototypes or field tests. There was also an incentive for solutions that were almost ready to enter the market. Funding was generally towards efforts from basic research to preliminary*design* , which generally occurred at university research centers or market research centers. However, it was noticed that the stages of *design*, laboratory testing and prototyping were open to incentive in the Brazilian market. In view of, the BCB and FENASBAC signed a technical cooperation agreement to create an innovation ecosystem that would promote incentives for the maturation of ideas, from their preliminary *design* stage to the prototype stage, with a view to promoting innovation in the National Financial System (SFN). The ecosystem should be characterized as a voluntary group of individuals, market and academic agents who are interested in providing support for the development of projects, from their conception to the prototype stage. And so LIFT arose.

THE LIFT OPERATING MODEL

LIFT is the result of an institutional arrangement between the BCB and FENASBAC by means of a Work Plan in a Technical Cooperation Agreement, which establishes the role of the BCB as an incentive for innovations within its strategic agenda and with the purpose of producing improvements to the SFN areas regulated by the BCB and counting on the operational support of FENASBAC.

The subsequent step was to invite the voluntary participation of partners who could help increase the maturity of projects proposed by Civil Society: academic agents and companies providing technology products and services.

Volunteer agents should engage in LIFT without financial rewards. In the first edition, in 2018 (Banco Central do Brasil, 2019), LIFT had Microsoft, IBM, AWS and ORACLE as technology partners, and an academic partner from Universidade de São Paulo (USP). LIFT currently has the following partnerships: AWS, Cielo, IBM, Instituto Fenasbac, Microsoft, Multiledgers, Oracle, R3, RTM, Finansystech and Veritran as technology partners at LIFT LAB; UnB, BRB, Vamos Parcelar, BxBlue and PagueVeloz at LIFT Learning.

The LIFT Ecosystem is developed to cover TRL levels from 1 to 7, and the BCB also has the Regulatory Sandbox to cover levels 7 to 9. The following components make up the ecosystem (Siqueira *et al.*, 2022, p. 6)[18]:

- LIFT Lab – Laboratório de inovação atuando como ACELERADORA.
- LIFT Learning – Iniciativa de pesquisa e inovação perante a academia.
- LIFT Day – Evento anual de divulgação de resultados.
- LIFT PaperSs – Revista periódica para a publicação de artigos e resultados do programa.
- LIFT Talks – Eventos de apresentação no formato de LIVES sobre assuntos de inovação no SFN.
- LIFT Challenge – Uma edição especial do LIFT Lab que propõe desafios temáticos em torno de temas de tecnologia de ponta aplicada ao SFN.

Their operation is described below:

LIFT LAB

LIFT LAB[19] is an innovation project accelerator. Projects are selected from applications made by individuals, even if on behalf of legal entities, where projects are submitted by an individual who is responsible for the project at LIFT LAB. During submission, the purposes of the project, the innovation impact it can create and the potential benefits for society must be described. The set of technologies that will be used and the technological partners to which they intend to have access are also indicated (Lift, [20?]). An executive committee is established, coordinated by BCB and FENASBAC, which includes technology partners to select projects. The selection criteria is divided into two parts: first, the BCB identifies projects the development of which can have an effective innovation impact on the SFN.

[18] Translation: "LIFT Lab – Innovation laboratory acting as an ACCELERATOR; LIFT Learning – Research and innovation initiative towards academia.; LIFT Day – Annual results disclosure event; LIFT PaperSs – Journal for publishing articles and program results; LIFT Talks – Events presented in LIVE broadcasts on innovation topics in the SFN; LIFT Challenge – A special edition of LIFT Lab that proposes thematic challenges around cutting-edge technology themes applied to the SFN " (Siqueira *et al.*, 2022, p. 6, editorial translation).

[19] Website: https://liftlab.com.br/.

With the list of relevant projects, the technology partners assess whether they wish to sponsor the projects and how that will be done – providing technology, allocating personnel to monitor, dedicating professionals to assist in development, etc. (Lift, [20?]). After the expression of interest from technology partners, a new list is created with the projects accepted for the last stage of selection: the constitution of the Project Monitoring Groups (GAP) – a group of volunteers from the BCB, FENASBAC, Technology Partners and, occasionally, guests who voluntarily wish to monitor the project during 3 months of development as mentors – with a weekly dedication of at least 2 hours. Projects will only be selected if there is at least one volunteering mentor to monitor them. Therefore, LIFT does not have a minimum or maximum number of projects selected per edition: the number varies according to the availability of GAP mentors (Lift, [20?]).

After selecting the projects, a set of meetings are held with participants before the laboratories begin: a) meeting with technology partners to define how to operate in each edition of LIFT LAB; b) meeting with mentors for guidance regarding the code of ethics, responsibilities and limits of acting as volunteering mentors; c) meeting with selected participants to establish delivery goals and scheduled dates for follow-up meetings and deadlines for the delivery of results – including guidance on the criteria for eliminating LIFT LAB in cases where performance is unsatisfactory ; d) technical meetings to set up virtual participation environments – the entire LIFT LAB is carried out remotely and virtually – and the tools that will eventually be made available by technology partners; and e) laboratory start meeting – held separately, with each project selected.

After the laboratories have started, GAP mentors and participants in each of the selected projects hold bi-weekly meetings on pre-defined dates and with a routine for producing and monitoring results, according to the model below:

1. Month 1 – First delivery: • Use Case Definition | user stories (item 3.1 of the technical report to be presented) • Partial prototype (its presentation). • Partial project report, containing at least: ■ Detailed project objective (Section 1 of the technical report); ■ Draft of theoretical/technological background (Section 2 of the technical report); ■ Product overview (Section 3 of the technical report); ■ Section 4 of the report – Scope of the Prototype; ■ Outline – Main innovative features (Section 5 of the technical report);
2. Month 2 – Second delivery: • Functional prototype of the solution – beta version • Updated version of the final report: - Introduction outline - Detailed project objective - Theoretical/technological background completed (Section 2 of the technical report); - Complete product overview (Section 3 of the technical report); - Scope of the Prototype (Section 4 of the technical report); - Main innovative features (Section 5 of the technical report);

3. Month 3 – Third delivery: • Functional prototype of the solution. Final report (see the model here): - Introduction - Detailed project objective; - Theoretical/technological background completed (Section 2 of the technical report); - Complete product overview (Section 3 of the technical report); - Scope of the Prototype (Section 4 of the technical report); - Main innovative features (Section 5 of the technical report) - Contribution to the SFN - Product Restrictions;
4. Final delivery of the revised report for inclusion in the LIFT PAPERS Journal, subsequent edition, formatted within one of the templates for report delivery:
    a. WORD Template: https://www.liftlab.com.br/modelos/MODELO RELATÓRIO LIFT.docx
    b. LaTeX Template: https://www.liftlab.com.br/modelos/Modelo Report (laTEX).zip

At the end of the edition's activities, the final projects are presented to society at a LIFT DAY event.

LIFT LEARNING

LIFT LEARNING is an initiative to involve students and researchers, all linked to higher education, in real-life projects in the financial industry. It aims to bring academia closer to the problems and challenges faced by industry and provoke the creation of solutions guided by science and technology (Lift [...], 2019).

The LIFT LEARNING program emerged from another work plan within the technical cooperation agreement between the BCB and FENASBAC. Within the program, maturity levels from 1 to 4 are addressed and, in some cases, problems identified in products that are at levels 8 or 9. While LIFT LAB addresses problems proposed by Civil Society to improve the SFN, LEARNING aims to solve problems identified by SFN companies that seek help from academia (Lift [...], 2019).

The operation of LIFT LEARNING has a different structure from the LAB (Lift [...], 2019):

a) companies and institutions present problems and challenges that need to be addressed through applied research;
b) FENASBAC promotes the selection of themes that are of strategic interest within the BC's agenda and builds a cooperation arrangement between universities, research funding agencies and the BC itself for the development of applied research;
c) a project is defined with scope, deadline and costs to be observed; the engagement commitments made by each of the participants; the limits of action and expected results of the research;

d) over a period of 4 months, which can be renewed, the research project is developed. Students, professionals from companies whose challenges were accepted, and mentors from academia – at least one researcher linked to a higher education institution or science and technology institute – participate in the project. As applied research is developed, techniques and knowledge are used to attempt to solve real problems in the financial industry; and

e) at the end, the results are presented to the participating companies – in a LIFT DAY event – and articles, books and other research materials related to the topics covered are developed.

LIFT LEARNING is an adaptation of the Accelerator model (Bound; Mulgan, 2019), generally applied to support companies, such as ***Startups***, for the academic universe, with a view to: i) promoting technical-specialized training of students; ii) encouraging the emergence of entrepreneurship among students; iii) developing skills in applying knowledge; iv) improving academic training; v) bringing together companies in the financial industry, academia and society in solving problems; and vi) allowing the appreciation and understanding of problems and challenges that impact the SFN by the BC, the system's regulator.

LIFT CHALLENGE

LIFT CHALLENGE (Banco Central do Brasil, 2022a, *online*)[20]

> é uma edição especial do LIFT [...], [que trata de problemas específicos propostos pelo BC para a resolução conjunta com] participantes do mercado interessados em desenvolver um produto minimamente viável (MVP) [...]

Within the theme proposed in the edition. All solutions aim to innovate for the National Financial System and for Brazilian society (Banco Central do Brasil, 2022a).

The main characteristic of the LIFT CHALLENGE is related to the proposition of specific themes, identified by the BC as relevant to the SFN, however the complexity of which must still be assessed regarding the application of concepts, technical feasibility and effective value for improving the financial system. It operates as follows:

1. The BC presents a theme and proposes a challenge for the development of minimum viable products by interested market players;
2. A selection of proposals is made for projects that adhere to the theme proposed by the BC, using criteria of maturity, execution capacity and nature of the proposed project, among other criteria specific to the edition. Unlike LIFT Learning, only proposals from legal entities, responsible for allocating infrastructure, technologies and services, are accepted;

[20] Translation: is a special edition of LIFT [...], [which addresses specific problems proposed by the BC for joint resolution with] market players interested in developing a minimum viable product (MVP) [...] (Banco Central do Brasil, 2022a, online, editorial translation).

3. Over the period established for the challenge, which may vary with each edition, a group of experts is formed, allocated by BC and FENASBAC to participate in monitoring the work of each project, developed by experts from participating companies. Biweekly follow-up meetings are held until the end of the projects;
4. Finally, the projects are presented to society at a LIFT DAY event.

LIFT DAY

LIFT Day is a series of events with the purpose of presenting to society the results of projects developed in the different LIFT modalities. During the event, the projects developed are presented and topics related to the financial industry, the technological impacts that may affect it and the topics that affect the financial life of society are promoted.

LIFT PAPERSS

At the end of each edition, all participants who complete projects within LIFT present a technical report describing the main aspects of the projects developed: the uses, the technologies applied and the respective impacts on society. The reports aim to stimulate new ideas and record the progress made during the development of projects in LIFT environments. Technical and scientific articles on topics that impact the Brazilian financial industry are also accepted.

LIFT TALKS

Throughout the year, participants in the LIFT ecosystem participate in an agenda of conversations about technology and innovation in the financial system. The conversations are transmitted via a streaming platform channel and aim to stimulate debates and instigate ideas and the possibility of developing new – or improving – existing products and services. During LIFT TALKS, regulatory agents engage in dialogue with society to resolve doubts from Civil Society and present regulatory perspectives that can contribute to innovation in the SFN.

THE TECHNOLOGICAL READINESS MODEL AS A WORKING METHOD AND MATURITY REFERENCE FOR INNOVATION PROJECTS

In 2018, the LIFT team sought to identify suitable instruments for assessing the technological maturity of existing products on the market. In the investigation of such instruments, article "*Technology readiness level (TRL)"* written by John Mankins was identified, in which the concept of technological maturity was presented (Mankins, 1995). An appreciation of other studies on the topic (Olechowski; Eppinger; Joglekar, 2015; Moorhouse, 2002; Bound; Mulgan, 2019) was sufficient for choosing the TRL as a conceptual instrument for evaluating projects in LIFT, which defined the entry criteria between levels 2 and 3 to deliver at level 4 or 5.

The choice, in 2018, proved to be correct. Today, the TRL is the standard instrument used to assess technological maturity in different industries. In general, the TRL establishes 9 maturity levels. Yet, it is necessary to apply them in a specialized manner to each environment or industry in which we intend to evaluate and promote technological maturity. In the context of LIFT, a TRL model was developed, using the 9 levels as a reference, to adapt the maturation of technologies in the financial industry environment. The maturity levels were characterized, as an adaptation of Mankins' proposal (1995), as described below.

LIFT TRL LEVEL 1

It is characterized by basic research and the observation of principles and patterns that may offer possibilities for the development of new technologies or applications of existing technologies. At this level, the principles and patterns are observed and their opportunities and possibilities are described and reported. It is addressed by the LIFT ecosystem in the LEARNING initiatives (Mankins, 1995).

LIFT TRL LEVEL 2

At level 2, new technological concepts or new forms of application are developed. These concepts are investigated so that their elements can be properly understood, and their application possibilities can be described. It is addressed by the LIFT ecosystem in the LEARNING and LAB initiatives (Mankins, 1995).

LIFT TRL LEVEL 3

At level three, the development of new products or services begins, using the concepts studied. Application forms, possible functions and characteristics that should be addressed and how are studied. Proofs of concept are also carried out to adequately test the possibilities of the technology identified or developed. It is addressed by the LIFT ecosystem in the LEARNING, LAB and CHALLENGE initiatives (Mankins, 1995).

LIFT TRL LEVEL 4

At level 4 of the TRL, experimental conditions are created for the integration of functional components, the applicability of which was demonstrated at level 3. At this level, the components are integrated in order to validate, in a laboratory environment, the business problems that can be solved with the application of the identified or developed technologies. At this level, existing legal restrictions and the possibilities of creating new regulatory models that enable the benefits highlighted by applied research or the imposition of restrictions to avoid damage due to their misuse are also evaluated. It is addressed by the LIFT ecosystem in the LEARNING, LAB and CHALLENGE initiatives (Mankins, 1995).

LIFT TRL LEVEL 5

At level 5, a business environment is defined with characteristics that allow experimentation and validation of the components that will integrate the products and services developed. Proofs of concept now have a more realistic character, and take place in real or very close to real environments. It is a transition level in which applied research gives rise to the development of real products and services in a market environment. It is addressed by the LIFT ecosystem in the LEARNING and CHALLENGE initiatives (Mankins, 1995).

LIFT TRL LEVEL 6

At level 6, a business environment is defined with characteristics that allow experimentation and validation of the products and services developed, not the components, as in level 5. Proofs of concept now have a more realistic character, and take place in real or very close to real environments. It is addressed by the LIFT ecosystem in the LEARNING and CHALLENGE initiatives. Scientific technical support is used for model adjustments in products developed in the laboratory and now used in real situations. At this level, BC REGULATORY SANDBOX projects are also developed, which do not make up the LIFT ecosystem (Mankins, 1995).

LIFT TRL LEVEL 7

Level 7 is used to analyze the results of level 6 and make adjustments and improvements to the products and services developed. It also evaluates market opportunities and the design of business models, costs, demands and risks involved with the application of products and services under development. *Beta-testing* can be started here, involving end users. It is addressed by the LIFT ecosystem in the LEARNING and CHALLENGE initiatives. At this level, BC REGULATORY SANDBOX projects are also developed, which do not make up the LIFT ecosystem (Mankins, 1995).

LIFT TRL LEVEL 8

Level 8 is marked by the development of the final product for market testing. *Beta-testing* is completed and the results of the development of products and services are approved. Also at this level, advisory instruments are developed for launching and marketing products on the market. It is a level only followed by LIFT and completely developed by Civil Society participants from one of the LIFT initiatives (Mankins, 1995).

LIFT TRL LEVEL 9

At this level, the product or service is launched on the market and set in operation. It is a level only followed by LIFT and completely developed by Civil Society participants from one of the LIFT initiatives (Mankins, 1995).

RESULTS PRODUCED BY LIFT BETWEEN 2018 AND 2021

The following results were produced in the LIFT ecosystem:

1. LIFT LAB – produced 60 new innovative prototypes in all editions since 2018;
2. LIFT LEARNING – 4 projects were developed resulting from the pilot edition (2020) with the Universidade de Brasília and the DF Research Support Foundation;
3. LIFT TALKS – more than 50 live broadcasts were held with more than 40 thousand views on YouTube;
4. LIFT PAPERS – 4 issues were published with the details of each project developed at LIFT LAB; and
5. LIFT DAY – 4 annual events were held to present the results to the market and society.

LIFT LAB: RESULTS

In the 2018 to 2021 editions, 73 projects were selected for acceleration. Of these, 60 were completed. In the 2018 edition, we had 12 projects (Banco Central do Brasil, 2019):

i. BLOCKCHAIN DE DIREITOS CREDITÓRIOS – decentralized platform for recording credit rights using *blockchain* technology (Cicconi; Stabile, 2019);

ii. BLOCKCHAIN PARA INFRAESTRUTURA DE PAGAMENTOS – implements an instant payments system operating 24x7 on *blockchain* technology (Prandini; Martins; Nuz, 2019);

iii. CRÉDITO IDEAL – uses artificial intelligence to configure the appropriate profile for offsetting credit based on the user's financial information (Dias; Andrade, 2019);

iv. CRÉDITO RURAL INTELIGENTE – management of rural credit operations using georeferencing and mobile technologies (Omar; Curto; Costa, 2019);

v. DIGICASH – instant payment (P2P) using *offline* mobile devices;

vi. INSTANT SPYGLASS – fraud detection platform with machine learning (ML) technologies;

vii. MEU PRIMEIRO CARTÃO – educational financial management platform for children up to 10 years of age;

viii. MOBI TRANSFER – integration platform between users and *fintechs* using *blockchain* technology (Borges, 2019);

ix. NOBLI – personal credit platform improved based on user information (Martins, 2019);

x. PROAGRO FÁCIL – platform for executing the Proagro flow by any financial institution (Moraes, 2019);

xi. SAFFE PAYMENTS – authentication of payments and financial services using facial recognition and artificial intelligence algorithms; and

xii. SISTEMA FINANCEIRO DIGITAL (SFD) – money transfer system between customers of financial institutions using *blockchain* technologies.

In the 2019 edition, we had 17 projects:

i. ANTECIPA FÁCIL – "[...] uma plataforma digital, criada com o propósito de promover o acesso ao capital de giro para pequenas e médias empresas, sobretudo aquelas desassistidas ou subatendidas pelo mercado bancário [...]" (Laranja; Chiliatto, 2020, p. 118)21;

ii. ANTECIPAÇÃO COM TRANSPARÊNCIA – a project that proposes "[...] um modelo para garantir que a redução na taxa de deságio para empresas de pequeno e médio porte [...]" (Battú; Santos, 2020, p. 129)22 ;

iii. BLUPAY – "O Switch de Pagamentos Instantâneos BluPay integrará as principais oportunidades geradas pelas mudanças previstas pelo Banco Central do Brasil no ecossistema financeiro com os comunicados sobre Pagamentos Instantâneos" (Rocha Junior, 2020, p. 33)23 ;

iv. FinID: DECENTRALIZED FINANCIAL IDENTITY MANAGEMENT – "este projeto visa criar uma identidade única, portável e segura para as instituições financeiras, com o cliente no controle dos seus próprios dados pessoais e viabilizando o acesso facilitado de contratação de serviços financeiros" (Marino et al., 2020, p. 245)24 ;

v. FINWEB – COLLABORATIVE ENTREPRENEURSHIP – creates a "[...] mecanismo que facilita a formação de parcerias colaborativas e o compartilhamento de receitas, por meio do pagamento simultâneo multipartes" (Freire; Castro; Castro, 2020, p. 229)25;

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21 Translation: "[...] a digital platform, created with the purpose of promoting access to working capital for small and medium-sized companies, especially those unassisted or underserved by the banking market [...]" (Laranja ; Chiliatto, 2020, p. 118, editorial translation).

22 Translation: "[...] a model to ensure that the reduction in the discount rate for small and medium-sized companies [...]" (Battú; Santos, 2020, p. 129, editorial translation).

23 Translation: "Instant Payments Switch BluPay will integrate the main opportunities generated by the changes anticipated by the Central Bank of Brazil in the financial ecosystem with the announcements on Instant Payments" (Rocha Junior, 2020, p. 33, editorial translation).

24 Translation: "this project aims to create a unique, portable and secure identity for financial institutions, with the customer in control of their own personal data and enabling easier access to contracting financial services" (Marino et al., 2020, p. 245, editorial translation).

25 Translation: "[...] mechanism that facilitates the establishment of collaborative partnerships and revenue sharing, through simultaneous multi-party payments" (Freire; Castro; Castro, 2020, p. 229, editorial translation).

vi. GAVEA MARKETPLACE –

> é um *Marketplace* de *Commodities* Físicas, uma plataforma digital de negociação que automatiza o processo de originação, cortando intermediários, sem burocracias, digitalizando contratos e reduzindo custos operacionais e transacionais, em um ambiente seguro e completo, onde tudo que acontece é imutável e rastreável (Nunes, 2020b, p. 3)[26].

vii. MIDAS – enables access to financial applications, previously restricted to potential investors, who do not have the minimum amount of resources to access them and have little or no knowledge about the financial market. As well as for those people whose return on investment is negligible or non-existent, educating them in practice in an interactive manner;

viii. SPIN PAY –

> [...] um produto que viabiliza a captura, a autenticação e a liquidação de uma transação de pagamento em compras *online*. O produto possibilita que um consumidor possa utilizar o saldo de sua conta para compras em plataformas *online*, direto do aplicativo da instituição financeira ou de [...] pagamento de sua escolha. (Chusid, 2020, p. 86)[27];

ix. P2P *Lending* with *Blockchain* – promotes the

> [...] uso da tecnologia de *blockchain* aplicada ao ambiente de uma *Fintech* de empréstimos P2P, com uma parceria com uma instituição financeira para a realização de *Cash-in* e *Cash-out* da plataforma de P2P, bem como o uso de um parceiro de histórico financeiro para determinar o risco do empréstimo ao investidor da plataforma de empréstimos P2P. (Specian; Benseler, 2020, p. 184)[28];

x. PROVI – platform for "elaboração de [...] contrato[s] *de Income Share Agreement* (ISA) [...] [onde] estudantes possam realizar um curso sem desembolso de recursos à vista e comecem a pagar apenas depois de conseguirem uma renda mínima [...]" (Baladi; Perino, 2020, p. 151)[29] ;

xi. QUADRA URBANA (QU) –

> [...] uma plataforma de gestão e rentabilização do ativo imobiliário, destinada a proprietários de imóveis e locatários que propiciará a estruturação de dados do mercado imobiliário (ex.: preço de venda, valor de locação, velocidade venda[s]) e viabilizará a antecipação de recebíveis de aluguéis para proprietários de imóveis por meio de uma experiência 100% digital (Trinta; Lobo; Teóphilo, 2020, p. 317)[30];

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[26] Translation: " is a Marketplace of Physical Commodities , a digital trading platform that automates the origination process, cutting out intermediaries, without bureaucracy, digitizing contracts and reducing operational and transactional costs, in a safe and complete environment, where everything that happens is immutable and traceable" (Nunes, 2020b, p. 3, editorial translation).

[27] Translation: " [...] a product that enables the capture, authentication and settlement of a payment transaction on online purchases. The product allows consumers to use their account balance for onlineplatform purchases, directly from the financial institution application or [...] payment of their choice. " (Chusid, 2020, p. 86, editorial translation).

[28] Translation: " [...] use of blockchain technology applied to the environment of a P2P lending Fintech, in partnership with a financial institution for the Cash-in and Cash-out transactions of the P2P platform, as well as the use of a financial history partner to determine the risk of the loan to the investor of the P2P lending platform " (Specian; Benseler, 2020, p. 184, editorial translation).

[29] Translation: "the development of [...] Income Share Agreement[s] (ISA) [...] [where] students can take a course without disbursing funds up front and start paying only after securing a minimum income [...]" (Baladi; Perino, 2020, p. 151, editorial translation).

[30] Translation: [...] a real estate asset management and profitability platform, aimed at property owners and renters that will provide the structuring of real estate market data (e.g.: sale price, rental value, sales speed[s]) and will enable the anticipation

xii. SAQUE SUPER FÁCIL – proposes an innovative model for "[...] o processo de saque de dinheiro, melhorando a experiência dos clientes [...] por meio da implantação da função "saque" nas máquinas de cartão instaladas nas empresas [...]" (Nunes, 2020a, p. 69)[31] ;

xiii. SAXPERTO – allows "[...] que clientes de bancos digitais ou carteiras digitais façam microssaques a partir de seu saldo disponível, através de uma rede de varejistas credenciados a um custo bastante reduzido" (Godoi; Batista, 2020, p. 200)[32] ;

xiv. SAZ – service platform to integrate services from several financial institutions into a single application developed using the *Banking as a Service* (BaaS) model (Silva; Gomes; Souza, 2020);

xv. TRANSFERHUB – "[...] é uma plataforma digital de tecnologia financeira voltada para o mercado de câmbio, que realiza o "casamento" das operações de compra e venda de moeda estrangeira para transferências internacionais" (Mellem, 2020, p. 220)[33];

xvi. VENCEHOJE – solution for "[...] busca automática de boletos e faturas gerados para um determinado CPF ou CNPJ, reunindo e organizando as obrigações em um único lugar" safely and quickly (Matarazzo; Nardez, 2020, p. 102)[34]; and

xvii. WIP – research project applied to a model for estimating the probability of dismissal of an employee from a private company (Neto; Lemos, 2020). The model "[...] serve como insumo para a análise de crédito na modalidade consignado privado e outras modalidades, reduzindo o risco de *default* e, consequentemente, a taxa de juros ofertada" (Neto; Lemos, 2020, p. 212)[35].

In 2020 edition number 3, 21 projects (Banco Central do Brasil, 2021):

1. FINCATECH – platform for centralizing information and evaluations about *fintechs* (Lima; Carvalho; Barboza, 2021);
2. INCO – *marketplace* for originating funding for real estate projects, Inco encourages competition between institutions and the reduction of the banking *spread* (Belisário; Borges; Ribeiro, 2021);
3. KALEA – *marketplace* for credit operations, where emphasis is given to those seeking funding (Cavalcanti; Rodrigues; Silva, 2021);

of rental receivables for property owners by means of a 100% digital experience (Trinta; Lobo; Teóphilo, 2020, p. 317)

[31] Translation: "[...] the process of withdrawing money, improving customer experience [...] through the implementation of the "withdrawal" function on card machines installed in companies [...]" (Nunes, 2020a, p. 69, editorial translation)

[32] Translation: "[...] customers of digital banks or digital wallets to make small withdrawals from their available balance, through a network of accredited retailers at a highly reduced cost" (Godoi; Batista, 2020, p. 200, editorial translation)

[33] Translation: "[...] is a digital financial technology platform aimed at the foreign exchange market, which links foreign currency purchase and sale operations for international transfers" (Mellem, 2020, p. 220, editorial translation).

[34] Translation: "[...] the automatic search for bills and invoices generated for a specific CPF (taxpayer identification number) or CNPJ (corporate tax number), gathering and organizing obligations in a single place" (Matarazzo; Nardez, 2020, p. 102, editorial ttranslation).

[35] Translation: "[...] serves as input for credit analysis in the private payroll modality and other modalities, reducing the risk of default and, consequently, the interest rate offered" (Neto; Lemos, 2020, p. 212, editorial translation).

4. MODELO DE SUCESSO COMPARTILHADO – funding option for students who can train themselves for digital life and only pay off the debt after obtaining a job that offers a salary above a certain pre-agreed amount (Quintão; Moura, 2021);
5. PREKS – solution that provides the technological infrastructure required for secondary “precatório”(court-ordered debt payment) negotiations, making them more transparent, agile and inclusive (Nasser; Miranda; Garcia, 2021);
6. PULSAR – proposes a platform for offering specific credits for health services (Reis, 2021);
7. POUPIX – aims to insert new people into the investment market by rounding purchase values to apply the rounding value (Bastos; Pereira; Hazin, 2021);
8. CAISHEN – financial platform to assist the management of micro and small entrepreneurs and focused on the pillars of financial education and competitiveness (Correia; Ribeiro, 2021);
9. JULIUS – tool that combines financial education with a practical financial control tool (Coura; Coura; Silva, 2021);
10. BILLAPP – financial platform for managing and paying various bills (Paulillo; Rodrigues, 2021);
11. PLUGGY – *open banking* platform in Brazil that offers the infrastructure for the private connection of data sources between users and financial institutions (Loiola; Correa; Urano, 2021);
12. LIV PAGAMENTO – technological solution that does not require a direct connection to the internet, it requires only resources which are already available on simpler cell phones and, as it is based on a QR code, can be integrated with the Pix (instant payment) system (Silva *et al*., 2021);
13. REConID – platform for recording consent and identity and managing a decentralized digital identity ecosystem (Formigoni Filho *et al*., 2021);
14. Tap On Phone – solution to give sellers and payment system institutions an alternative point of sale (POS), based on a cell phone application without the need for any other equipment (Riveira, 2021);
15. X4FARE – offers a payment arrangement for urban mobility services, connecting transactional accounts to make ticket payments with support for environments with difficult telecommunications stability;
16. BANKHUB – *regtech* which aims to provide an initiation platform for banks and *fintechs* that wish to enter the Brazilian financial system (Jungbluth, 2021);

17. ATIVO DIGITAL FLORESTAL – designs, implements and demonstrates the execution of the generation of forest bonds (of preservation or cultivated areas) verifiable and automated by data that allow the creation of a new market and environmental services (Eberhardt; Teixeira; Marques, 2021);
18. BIPP – *marketplace* integrated with a payment system, in which agricultural producers, under the monitoring of organic certifiers, can present their products, negotiate with buyers from the processing industry and settle the operation by means of a digital account (Linhares; Valdeci, 2021);
19. CULTE – platform to offer microcredit to small family farmers who do not yet have access to the banking system (Rugeri Junior; Rugeri, 2021);
20. CROOPI – mass cooperation platform, allowing people to build wealth by supporting sustainable companies and businesses (Fontes; Assad, 2021); and
21. FARMER ID – tool that uses artificial intelligence to analyze information aimed at agribusiness (Costa; Girotto, 2021).

In the 2022 edition, 10 projects (Banco Central do Brasil, 2022b):

1. AGRO OPEN BANK – platform for evaluating and offsetting credit via OPENFINANCE. Based on information and documents entered by the producer, the system will search and cross-reference, in real time, public and private databases of financial, productive, land, environmental information and the results of recent harvests. Thus, in a short time, this producer will be able to receive proposals from several banks and funds registered on the platform (Ferreira; Corral, 2022);
2. CENTRALIZAÇÃO PARA PAGAMENTO DE TRIBUTOS ATRAVÉS DE CARTEIRA DIGITAL – project for paying taxes through the centralization of payments in a single digital wallet and using an additional layer of security implemented by DLT Corda, bringing more confidence to this operation along the lines of OPENFINANCE (Souza; Canteiro, 2022);
3. EMPODERAMENTO DO CLIENTE BANCÁRIO – Personal Finance Management system using *OpenBanking*API, with a set of services available in the cloud for direct consumption by financial institutions. The project allows the promotion of financial education and the maturation of decision-making in borrowers and SFN users (Pereira; Oliveira; Ceci, 2022);
4. FINANÇAS PARA MOTORISTAS E ENTREGADORES – financial inclusion project that allows new data analysis models and the creation of an alternative credit analysis model. It offers an *OpenBaking* platform for credit analysis, combined with the analysis of the financial behavior of users who authorize its use to expand access to the SFN (Machado; Gomes, 2022);

5. FORMALIZAÇÃO DA OPERAÇÃO DE CRÉDITO 100% DIGITAL – platform for formalizing loans in *OpenBanking*. Through a centralized formalization solution, financial institutions can standardize processes for their banking correspondents, reducing information asymmetry and transactional costs. The platform can interact with customers from the offer to contracting either through the platform or via *Whatsapp* messenger (Santana; Martir, 2022);
6. GRANA SOLIDÁRIA – investment and nanomanagement platform that aims to create a link between investors and nano/microentrepreneurs, creating processes that aim to maximize the business success rate, improving the quality of life and the economy of underserved areas in Brazil. The platform innovates by combining microcredit and the so-called *Worms Eye View*, both creations of Indian Nobel Peace Prize winner Muhhamad Yunus (Brito; Brito, 2022);
7. OBSERVATÓRIO AMAZÔNIA – aims to minimize information asymmetries dispersed across different databases, which has made the analysis of information by financial agents when granting rural credit complex. This proposal seeks to simplify such procedures, offering, in summary, crucial information for decision-making (Miranda; Santos; Castro, 2022);
8. PLATAFORMA DE OPEN BANKING PARA TODOS – makes use of technological innovations to allow companies to scale their businesses using *Open Banking* data. The prototype developed during this project is a more predictive credit model, created with *machine learning* and cutting-edge AI technologies. Technical approach: The prototype uses *machine learning* techniques, AI and cutting-edge credit models such as LGB, XGB, RF, LR and SVM, which are highly predictive and scalable (Chan, 2022);
9. RBDC – interoperability model between regulated systems of the National Financial Sector (SFN) and decentralized networks, known as DLT. Through the "tokenization" of electronic currency with verifiable registration, conversion of digital asset modality and joint operationalization of these processes, allowing interoperability between the Brazilian financial sector and global DLT networks. The model can be generalized to other types of assets and regulated systems and links with permissioned or public *blockchain* networks (Teixeira; Yamashita; Batista, 2022); and
10. SIMPLIFICANDO PAGAMENTOS DIGITAIS: PREVENÇÃO À LAVAGEM DE DINHEIRO E ANTIFRAUDE – implementation of a framework that employs different machine learning techniques, in addition to statistical and graph algorithms, as methods to prevent money laundering in the Pix ecosystem. It enhances security solutions that are in full compliance with the regulations provided by the BCB and that follow the evolution of cyber attack attempts that become more sophisticated over time (Coimbra *et al*., 2022).

In the 2022 edition, the following projects were selected, the final presentation of which is scheduled for March 2023: selected for the 2022 edition of LIFT Lab (Banco Central do Brasil, 2023).

i. Itaú – DeFi – Liquidity Pool;
ii. Protocolo de Crédito Descentralizado;
iii. G10 Bank;
iv. Easy Hash. Microcrédito Descentralizado;
v. Interoperabilidade entre o Real Digital e um Blockchain público;
vi. Redução de custos e complexidade no uso de CCBs, através da aplicação de smart contracts e stablecoins;
vii. Itaú – Pix com uso de NFC e QR Code Offline; and
viii. Ailos Pix Crédito.

LIFT LEARNING: RESULTS

Launched in 2020, LEARNING had its first edition in partnership with the Universidade de Brasília (UnB) and was funded by means grants from the Federal District Research Support Foundation (FAP-DF). In this edition, the following innovation projects were developed: Keylock authentication, an application for integrating Pix services for legal entity customers.

1. Developed jointly with UnB and Banco Regional de Brasília (BRB);
2. a user authentication system using biometric technologies for registering and enabling customers in the banking environment (*onboarding*), developed together with UnB and company BXBlue;
3. an authentication solution with OAuth, a standard protocol for authorizing transactions so as not to expose user credentials, enabling *OpenBanking* solutions in an integrated employee benefits management system via Pix. Project developed jointly with UnB and PagueVeloz; and
4. A solution for managing tax debts and installment options using integrations with PIX, developed together with UnB and company Vamos Parcelar.

One of the LIFT Learning results in 2021 was the publication of a specialized book on “O Regulador Inovador: Banco Central e a agenda de incentivo à inovação”, sponsored by Instituto Propague (Paixão; Aguiar; Ragazzo, 2020).

The 2021 edition was compromised due to health restrictions caused by SARS-Covid, and the 2022 edition is underway. In addition to the projects per se, a Decentralized Finance course was held with the aim of bringing together students, developers and finance experts to learn about Decentralized Finance (DeFi), available on *Youtube*[36].

LIFT CHALLENGE: RESULTS

Launched in 2021, LIFT Challenge is in its first edition. The selected themes aim to evaluate effective use cases for using a digital currency issued by a central bank (CDBC), in this case the DIGITAL BRAZILIAN REAL, evaluating its technological feasibility. The themes were selected within four (4) prioritized categories:

1. Delivery versus Payment, or DvP, aimed at settling transactions with digital assets, both native to the digital environment and "tokenized";
2. Payment versus Payment, or PvP, aimed at exchanging currencies;
3. Internet of things, or IoT, aimed at algorithmic settlement or direct settlement between machines; and
4. Decentralized Finance, or DeFi, aimed at defining protocols with settlement based on a CBDC and taking into account *compliance* requirements and supervision set by regulatory standard.

The following projects have been selected and are under development:

AAVE "Reúne recursos dos poupadores (formando um fundo, ou *pool* de liquidez), por meio de ferramentas de finanças descentralizadas (DeFi), com foco em oferecer empréstimos e garantir que essas operações se adequem às normas do sistema financeiro nacional" (Banco Central do Brasil, 2022a, *online*)[37].

BANCO SANTANDER BRASIL

> "Propõe a conversão para o formato digital ("tokenização") do direito de propriedade de veículos e imóveis e sua negociação, mediante o método de pagamento contra entrega (DvP), no qual o pagamento pelo bem (casa ou automóvel) ocorre no mesmo instante em que seu direito de propriedade é transferido para o comprador" (Banco Central do Brasil, 2022a, *online*)[38].

FEBRABAN "Propõe a negociação de ativos financeiros digitalizados (tokenizados) usando o método de pagamento contra entrega (DvP), no qual o pagamento pelo ativo financeiro ocorre no mesmo instante em que seu direito de propriedade é transferido para o comprador" (Banco Central do Brasil, 2022a, *online*)[39].

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[36] Website: https://rebrand.ly/CursoDeFi.

[37] Translation: " It gathers resources from savers (forming a fund, or a liquidity pool), by means of decentralized finance (DeFi) tools, with a focus on offering loans and ensuring that these operations comply with the rules of the national financial system " (Banco Central do Brasil, 2022a, online, editorial translation).

[38] Translation: "It proposes the conversion to digital format ("tokenization") of the right to ownership of vehicles and properties and their negotiation, using the delivery versus payment (DvP) method, in which payment for the asset (house or automobile) takes place as its ownership interest is transferred to the buyer " (Banco Central do Brasil, 2022a, online, editorial translation).

[39] Translation: " It proposes the trading of digitized (tokenized) financial assets using the delivery versus payment (DvP) method, in which payment for the financial asset takes place as its ownership interest is transferred to the buyer " (Banco Central do Brasil, 2022a, online, editorial translation).

GIESECKE + DEVRIENT “Apresenta um sistema de pagamentos e transferências baseado no real digital, que pode fazer transações mesmo quando pagador e recebedor estiverem sem acesso à internet (pagamentos *dual offline*)” (Banco Central do Brasil, 2022a, *online*)[40].

ITAÚ UNIBANCO

> "Propõe facilitar pagamentos e transferências internacionais entre Brasil e Colômbia por meio do uso de método de pagamento contra pagamento (PvP), em que detentores de moedas diferentes – no caso, o real e o peso colombiano – podem trocar essas moedas entre si, e a entrega da moeda para cada um dos envolvidos acontece simultaneamente". (Banco Central do Brasil, 2022a, *online*)[41].

MERCADO BITCOIN “Propõe a negociação de ativos digitais (com foco em criptoativos) por meio do método de pagamento contra entrega (DvP), no qual o pagamento pelo criptoativo ocorre no mesmo instante em que seu direito de propriedade é transferido para o comprador” (Banco Central do Brasil, 2022a, *online*)[42].

LIFT DAY: RESULTS

LIFT Day editions were held in 2019, 2020, 2021, 2022, and the next edition with the results of the 2022 projects is scheduled for March 2023. During the event, technological contributions, applied innovations and perspectives of use for projects developed in the LIFT ecosystem are presented (Revista [...], [2018?]).

LIFT PAPERS: RESULTS

Four editions of the Financial and Technological Innovations Laboratory Journal – LIFT PAPERS (Revista [...], [2018?]) were published.

CONCLUSION

The LIFT ecosystem enters its sixth year of operation with the 2023 edition. It has been a relevant initiative for the development of innovation in the SFN and has operated as an educational agent for learning project management and exploration techniques and development of technologies, and a reference for the actions of regulatory agents in encouraging innovation in Brazilian society.

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[40] Translation: “ It introduces a payment and transfer system based on the digital Brazilian real, which can carry out transactions even when the payer and recipient have no internet access (dual offline payments)” (Banco Central do Brasil, 2022a, online, editorial translation).

[41] Translation: “It proposes to facilitate international payments and transfers between Brazil and Colombia by using a payment versus payment (PvP) method, in which holders of different currencies – in this case, the Brazilian real and the Colombian peso – can exchange these currencies with each other, and each the currency to each is delivered simultaneously ” (Banco Central do Brasil, 2022a, online, editorial translation).

[42] Translation: “ It proposes the trading of digital assets (with a focus on cryptoassets) using the delivery versus payment (DvP) method, in which payment for the cryptoasset takes place as its ownership interest is transferred to the buyer” (Banco Central do Brasil, 2022a, online, editorial translation).

Characterized from a social business perspective on account of its objectives, it is oriented towards serving a community, rather than generating profit. The ecosystem has an independent management model, a democratic decision-making process, focusing on the engagement of people and effectiveness in the contribution of work and the lack of income distribution. It has explicit objectives to benefit society, being an initiative developed by a group of citizens with a participatory nature, which involves people affected by the activity within a decision model not based on capital ownership, but on representative participation in activities. For all these reasons, LIFT can be considered a social business to promote financial and technological innovations.

Its educational character results from the practical application of technologies in sharing knowledge among participants, giving rise to a learning model that is very similar to that described by Vygotsky (2007) as the “Zone of Proximal Development”. As projects are developed, concepts and ways of using them to benefit the creation of innovations are shared. The meetings and discussions held within the ecosystem allow all agents involved to mature and learn, resulting in a significant increase in experiences and the development of products that are as mature as they are innovative.

The identification of impact technologies in the financial industry and the anticipation of regulatory models, by means of the comprehension of the operation of new products that can impact the sector, have turned the LIFT ecosystem into an environment of great utility for all agents involved, and with benefits and results for Civil Society.

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