



TIP Working Party
CO-CREATION PROJECT
2019-2020

Case study from France



b<>com Technology Research Institute

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Please cite as:

Guilbaud, B. (2020), "Case study from France on b<>com Technology Research Institute. Contribution to the OECD TIP Co-creation project". Accessible online [as of 9/12/2020]: <https://stip.oecd.org/stip/knowledge-transfer/case-studies>

Executive Summary

Overview & theme

Created in late 2012, the b<>com Technology Research Institute is a technology pioneer and provider and an innovation accelerator for every business that uses digital to boost its competitive edge. b<>com is 50% funded by its Members (Shareholders) and 50% by the national “Programme d’Investissement d’Avenir (PIA)” instrument. The overall 2012-2025 budget represents 280M€.

b<>com addresses several industries: culture & creation, digital infrastructures, health, defence and industry 4.0. Its laboratories bring together about 330 talented people from a variety of disciplines and cultures in areas like artificial intelligence, immersive video and audio, content protection, 5G networks, the Internet of Things, and cognitive technologies. 50% of them are b<>com employees and 50% Members’ employees who are missioned at the service of the Institute. The scope of the activities, both at research level and at engineering level as well as the impact targets are international by nature.

Partners - shareholders

The b<>com initiative was set by Images & Réseaux Competitive Cluster to answer a Request for Proposal issued by the French authorities under the umbrella of the “Grand emprunt” programme (today the PIA) in 2010.

Every single partner must be considered as a shareholder with regards to its co-investment obligation. The shareholders are 7 Large Groups, 11 SMEs, 10 Universities and Engineering Schools, 2 Research Organisations. Some are Founding Members others are Associated Members.

The companies are mainly Service Operators or equipment manufacturers. They all have R&D, Marketing & Sales teams and some have their own plants.

All industrial members have a global international reach. The academic members have international reach for their research activities, and national one for their education programmes.

b<>com is formally administrated by a board of administrators (4 meetings per year) and by an executive committee. Research Projects are regularly discussed between shareholders and b<>com’s team formally and informally.

Management and evaluation

The Executive Committee, in charge of b<>com’s management, is composed of b<>com’s employees only to avoid any conflict of interest and guarantee neutrality with regards to the partners.

The “Agence Nationale de la Recherche (ANR)” and the “Haut Conseil de l’évaluation de la recherche et de l’enseignement supérieur (Hcéres)” are respectively in charge of the administrative and financial assessment and of the scientific assessment of the Institute.

All IP results developed in b<>com’s projects are owned by b<>com which is in charge of their valorisation for commercial purpose. Free Licences can be granted to the members for R&D projects.

Milestones and KPIs are set at b<>com’s level (organisation) and assessed every year and every 3 year. Another set of KPIs at project’s level is assessed during key project milestones (kickoff, mid & end of project).

Key learnings and takeaways

Key success factors are : 1) Co-investment to share risk & opportunities preferred to subventions 2) Delegation of leadership to an independent team 3) IPR co-creation initiative ownership

Recommendations for new co-creation initiative are : 1) Efficient and open-minded approach; 2) Strong rules synchronized to milestones to be set to stay part of the project;

The key challenges and learnings are 1) To Spend time on IPR ownership management rules to make project creation easier and quicker 2) To find an agreement to keep the size of the board of administrators below 15 seats

1. GENERAL CHARACTERISTICS OF THE CO-CREATION INITIATIVE

Name of the initiative*:	<i>b<>com Institute of Technology</i>
Start date*:	<i>November 2012</i>
Expected end date*:	<i>December 2025</i>
Country/ies where partners are based*:	<i>France</i>
Budget of the initiative*:	<i>280 M€ (2012-2025)</i>
• Share of budget co-funded by members (shareholders):	<i>68 000 000 €</i>
• Share of public funding:	
○ French state:	<i>112 M€ (PIA1)</i>
○ Regional & local authorities:	<i>36 M€</i>
• Share of budget co-funded by VC or other sources:	<i>80 M€</i>
Main focus*:	<i>Technological Research</i>

Goal and objective of the co-creation initiative

- 1*. What is the vision of the co-creation initiative? (e.g., stimulating research and discourse about a new model of global governance; platform for outcomes-based innovation to save and improve lives in low-income countries).

The co creation initiative aims at creating a "common house" (with dedicated physical places - 7 000 m² including 6 000 m² in Rennes -, with a patrimonial process of the institute to be owner of the main place in long term - 9 years) to bridge the gap between French public and private research & innovation entities, co-investing to share opportunities and risks on co-decided innovation markets and research topics.

b<>com is thus a private innovation center designed wich is a tech pionner and provider and an innovation accelerator for every business that uses digital to increase its competitiveness and to boost innovation in digital technologies. Research topcis and targeted markets are co-decided by the board members. Their initial research topics and targeted markets in 2012 have been approved by the public authorities.

B<>Com Staff is composed by its own employees and employees coming from its shareholders (333 people by 2019, 50/50 ratio).

b<>com is a unique co-investment model that pioneers and provides knowledge, know-how and technology to its shareholders and to market players from various industry sectors. These sectors are:

- *Cultural & Creative industry;*
- *Telecommunications and Network Infrastructures industry;*
- *E-Heath industry;*
- *Defense and Cybersecurity industry;*
- *Industry of the future.*

- 1A. What is the rationale behind the vision of the co-creation initiative?

The rationale is all about reaching critical sizes in specific technological research areas, mixing skills, genders, cultures, thinking out of the box, promoting creativity, finding a way between fundamental research and markets (developing maturity).

The rationale is also about an historically constituted ecosystem in digital technologies willing to serve its natural legacy targets (Telecommunications and IT infrastructures, Cultural & Creative industries (Digital Tv, cinema), e-Health technologies) but also other industry branches.*

The rationale is finally about international competition and incentives to share opportunities, skills, risks and costs (costs of failure) on specific research and innovation domains that are too expansive to be addressed by a single player alone.

- 1B. Was it someone's initiative or was it jointly set by all partners? Please provide details on the mechanisms implemented to co-develop the vision.

Images et réseaux¹, which has been created under associative status by 2006, gathered about 300 business, research labs, engineering schools and universities, all dealing with digital technologies (images, videos and networks). Images et réseaux aims to create collaborative projects between members.

Proposal par le pôle Image & réseau issued in 2010 by the French umbrella Programme PIA.

The Images & Réseaux Competitiveness Cluster's Board of Directors took the decision to answer to a Request For Proposal (RFP) issued by the French government under the umbrella of "Programme d'investissement d'avenir".

Board members of Images et Réseaux have decided to answer by 2010 (see detailed timeline at Q10A below). In this RFP, the Institute of technological research was described. Most of the companies and organizations of the ecosystem had to face critical size issues in different strategic fields of research. Co-investment to share skills, opportunities but also risks and costs was a very interesting idea for all of them. Moreover, it was meaningful for the equipment manufacturers to have some of their engineers and researchers being out of box (not on the day to day work with the customers) to prepare the future, thanks to research, out of the box thinking, trainings, new methodologies, ... About 30 out of 300 of Images et Réseaux made the decision to join the b<>com initiative as shareholders.

- 1C. Has the vision of the initiative ever been revised? Why?

The initial vision of the co-creation initiative is regularly reviewed but has not yet been revised. The positioning has been adapted to include additional targeted markets (from 3 to 5²) and concentrating the fields of research (from 9 to 6³).

The main objective remains creating a "common house" to bridge the gap between French public research and private research & innovation, co-investing and sharing opportunities and risks on co-decided innovation markets and research topics.

- 2*. What are the main objectives of the initiative?

- 2A. Are there plans to commercialize the co-created products and/or services? Please explain.

The main mission of b<>com is to boost its members' but also industry players' innovation (tools, products and services), and their competitiveness by providing its members innovation as well as them key differentiators in digital ingredients. It can be new tools, products and services to improve their competitiveness. Thus b<>com is not aiming at commercializing directly the co-created products and/or services. However, in some specific cases, it can be done. Some of these are:

- *Early adopters willing to test their key customer's interest or to demonstrate/train on key differentiators brought by new technologies thanks to Proofs of Concept developed and maintained by b<>com;*
- *Early stage digital tech ingredients or services to define/specify the Minimum Viable Product before transferring it to a member or targeted industry player;*
- *Opportunistic Sales of innovations which are disclosed at their early stage during major international Trade Shows;*
- *Co-created products which are not any longer part of the member or targeted industry player strategy;*

¹ <https://www.images-et-reseaux.com>

² *Cultural & Creative industry; Telecommunications and Network Infrastructures industry; E-Health industry; Defense and Cybersecurity industry; Industry of the future.*

³ *Images & Sound Processing, 5G & IoT, Cybersecurity, Artificial Intelligence, Augmented Reality and Virtual Reality, Cognitive Technologies & Human Factors*

Non-governmental organizations (NGOs)												
Personal engagement												
Government:												
Public authorities	4		4			4						4
Government agencies	1			1								
Transnational organizations												

Notes:

- (a) Operators
- (b) Some of the partners are located in France but do have teams in other countries
- (c) Are included as "Universities" Engineering & Business Schools as well as University Hospitals

- 5*. Were there any conditions to participate in the co-creation initiative? (e.g. amount of funding provided, data sharing conditions, type of expertise, etc.)

There are specific conditions to become a member of b<>com. These conditions are described in a set of documents which have been approved by all the parties (shareholders). The two main documents are:

- *b<>com status (ministerial decree)*
- *b<>com membership charter (private agreement)*

Three kinds of members are referred to in these documents:

- (d) *Founding members*
- (e) *Associate members for 10 years*
- (f) *Associate members for 3 years*

These documents describe members' Rights and Duties.

To become a member, the candidate company has to be approved by the board members. Among the financial (co-investment) duties are:

- (a) *Initial allocation in K€, Founding members only*
- (b) *Annual subscription in K€*
- (c) *Special contribution in K€*
- (g) *Annual Human Resources & Material secondment (as defined by the french labor Code)*

100% of the intellectual property assets generated during b<>com's projects (the co-initiative), belong to b<>com.

- 5A. If there were any criteria for selecting partners, please, name them

There are two main criteria:

- *the willingness to value collaboration/partnerships, to value multidisciplinary research, to open minds, to grow talents, to develop knowledge and to boost innovation of 5 key industry branches' players. To be selected, the candidate shareholder must demonstrate to the board members its capability to develop research and engineering among 6 different expertise domains (Images & Sound*

Processing, 5G & IoT, Cybersecurity, Artificial Intelligence, Augmented Reality and Virtual Reality, Cognitive Technologies & Human Factors);

- the commitment to respect the rules which have been co-defined.

For each co-creation partner, please, provide the following information:

- 6*. Name of organization and its scope of activities (local/regional/national/international) and website (if available)

	<i>Founder Associate</i>	<i>Industry academic</i>	<i>National International</i>	<i>Country</i>	<i>Web</i>
Orange	Founder	Industry LG	International	France	
TDF	Founder	Industry LG	International	France	
Harmonic Inc (ex TVN)	Founder	Industry LG	International	USA	
Artefacto	Founder	Industry SME	International	France	
BBright	Founder	Industry SME	International	France	
Ekinops	Founder	Industry SME	International	France	
ExFO (ex Astellia)	Founder	Industry SME	International	Canada	
Imascap	Founder	Industry SME	International	USA	
Kerlink	Founder	Industry SME	International	France	
Secure IC	Founder	Industry SME	International	France	
<i>Mitsubishi Electric RCE</i>	<i>Associate3</i>	<i>Industry LG</i>	<i>International</i>	<i>Japan</i>	
<i>Naval Group</i>	<i>Associate3</i>	<i>Industry LG</i>	<i>International</i>	<i>France</i>	
<i>Airbus Defense and Space</i>	<i>Associate3</i>	<i>Industry LG</i>	<i>International</i>	<i>France</i>	
<i>Nokia</i>	<i>Associate3</i>	<i>Industry LG</i>	<i>International</i>	<i>Finland</i>	
<i>Aviwest</i>	<i>Associate3</i>	<i>Industry SME</i>	<i>International</i>	<i>France</i>	
<i>Enensys</i>	<i>Associate3</i>	<i>Industry SME</i>	<i>International</i>	<i>France</i>	
<i>Human Design Group</i>	<i>Associate3</i>	<i>Industry SME</i>	<i>International</i>	<i>France</i>	
<i>Viaccess-Orca</i>	<i>Associate3</i>	<i>Industry SME</i>	<i>International</i>	<i>France</i>	
CentraleSupélec	Founder	Academic	National	France	
Inria	Founder	Academic	National	France	
Insa Rennes	Founder	Academic	National	France	
IMT Atlantique	Founder	Academic	National	France	
Université de Rennes 1	Founder	Academic	National	France	
<i>Université de Bretagne Occidentale</i>	<i>Associate10</i>	<i>Academic</i>	<i>National</i>	<i>France</i>	
<i>Universitary Hospital Rennes</i>	<i>Associate3</i>	<i>Academic</i>	<i>National</i>	<i>France</i>	
<i>Universitary Hospital Brest</i>	<i>Associate3</i>	<i>Academic</i>	<i>National</i>	<i>France</i>	
<i>Inserm</i>	<i>Associate3</i>	<i>Academic</i>	<i>National</i>	<i>France</i>	
<i>Rennes School of Business</i>	<i>Associate3</i>	<i>Academic</i>	<i>International</i>	<i>France</i>	
<i>ENIB</i>	<i>Associate3</i>	<i>Academic</i>	<i>National</i>	<i>France</i>	
<i>ENSTA Bretagne</i>	<i>Associate3</i>	<i>Academic</i>	<i>National</i>	<i>France</i>	

7*. Please explain the rationale of involving this partner in the co-creation project

Most of the partners were (and still are) members of an international competitive cluster named Images & Réseaux whose main target is to build, to assess and to label French collaborative projects.

Each of the co-creation partner is a key player within one or several of the markets that initiative is targeting.

Each of the co-creation partner has its own R&D team, is customer driven and wants to boost its innovation.

Each of the co-creation partner is willing to co-invest to share skills and knowledge, to reach team critical size on key topics, to share opportunities, costs and risks.

8*. Please explain the role and main responsibilities of this partner in the co-creation project

All the Founding members have taken part in the major phases of the project construction.

- *Orange who is the biggest investor (but minority shareholder without blocking position) holds one seat and chairs the Board of Directors.*
- *Inria is Vice Chair of the Board of Directors.*
- *IMT Atlantic is treasurer.*
- *Each Founding Large Group holds one seat at the Board of Directors*
- *Each Founding Academic organization holds one seat at the Board of Directors*

The Founding & Associate SMEs holds one seat at the board

- *The group of Associate Large Groups holds one seat at the Board of Directors.*
- *The group of Associate Academic Organizations holds one seat at the Board of Directors.*

9*. What is the financial engagement of this partner in the co-creation initiative (i.e. what is the share of funding they provide overall and for each of the activities of the co-creation project)?

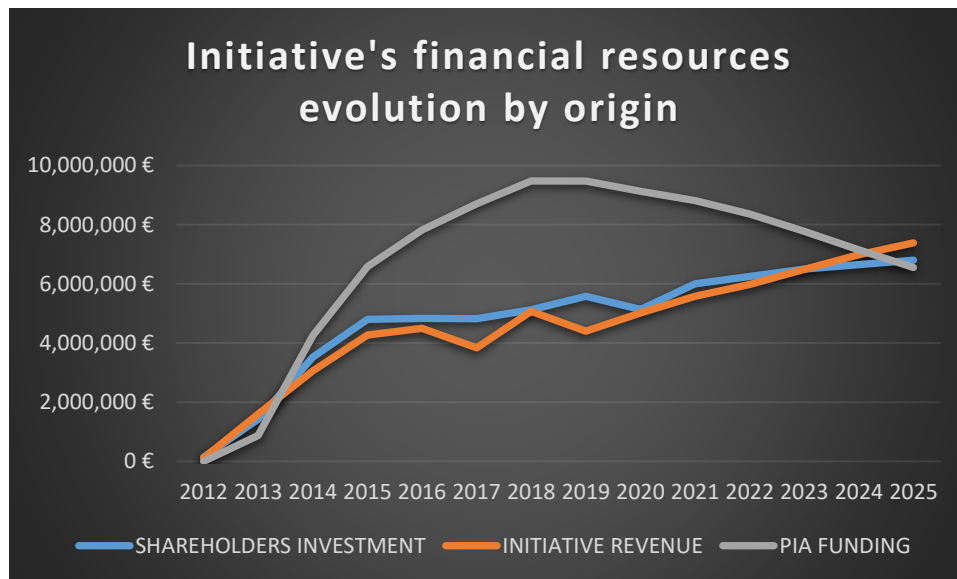
The financial engagement of each shareholder is confidential. However, for the purpose of the discussion the following figure gives an overview of the three main types of financial resources of the co creation initiative.

The co-creation initiative has mainly been supported by its shareholders over its first year of existence. The shareholders provide financial resources, personnel (Mise à disposition) and Devices/Platforms. Personnel and Devices secondement valorization process follows the French labour legislation and is checked by the National Research Agency⁴.

Then the French government funding (PIA – Programme investissement d’avenir) has been used to support the development of the initiative, funding specific key investments - for instance dedicated platforms like the initiative’s European Code of Conduct 2016 awarded data center, network infrastructure, storage, High Performance Computing, security and confidentiality – or research and innovation projects. This funding reach 50% of the total amount of resources in 2017. It is now decreasing and is expected to represent less than 33.33% of the financial resources by the end of 2025.

Over the same period, the co-creation initiative must develop its own revenue through R&D contracts, proof of concept sells, European collaborative projects participation, IP licensing, and in some minor cases direct products sells and other funding resources.

⁴ ANR : Agence Nationale de la Recherche – French National Research Agency (<https://anr.fr/en/>)



2. MANAGEMENT STRATEGY

10*. Who is responsible for co-creation process management?

Images & Réseaux Competitive cluster was responsible for the co-creation management. Its CEO and CTO were directly in charge under the responsibility of the cluster Board of Directors.

Q10A*. Was a steering group or advisory committee set up? If so, please provide details on its role and frequency of interactions.

Images & Réseaux' CEO held the overall leadership. Project creation lasted 30 months :

. April 2010: à l'agenda du board du cluster Images & Réseaux

. December 2011: "go" from the international jury appointed by the French government

. May 2012: French decree portant creation de b<>com

. October 2012: financial agreement

. November 2012: approval CEO by SGPI. b<>com's CEO, former Images & Réseaux' CEO, has been appointed by the board of Directors in November 2012 after approval of the SGPI⁵.

Several working groups were created, each group being sponsored by one director of the Board. The groups followed the RFP's key requests:

- o Strategy, projects & platforms, business plan*
- o Valorization, Intellectual Property rules*
- o Governance & organization overview*
- o Educational engineering*

Additionally, 9 different groups were created to specify the first projects expected to be launched as soon as the co-initiative would be created.

o

11*. What is the frequency of interaction between co-creation partners? (please select) if necessary / Once every few months / Several times a month / Regularly

⁵ SGPI : Secrétariat Général Pour l'Investissement. (<https://www.gouvernement.fr/le-secretariat-general-pour-l-investissement>)

Q11A*. Please describe the nature and frequency of interaction between all couples of partners

Board of Directors Meetings: every quarter (ordinary meetings) with an average of 2 extraordinary meetings a year. The Board of directors is composed of 6 industrial members, 5 academic members and 2 qualified personality, and 1 representative of b<>com engineers and researchers.

Members' Assembly: yearly

Scientific Council Meeting: yearly

Educational Engineering Strategic Council Meeting: every quarter

Research & Innovation Teams Work: on a daily basis (same location - co-initiative real estate)

12*. What are the main means of communication among co-creation partners? (Please choose all appropriate answers)

- a) Official meetings at the end of the reporting period (quarterly, yearly)
- b) Sharing of newsletters, documents, reports, publications
- c) Digital tools (e.g. email communication, conference calls, internet platforms)
- d) Conferences, workshops, etc., engaging external stakeholders
- e) Personal meetings
- f) Other (please specify): participation to major worldwide tradeshows

13*. Is there a partnership agreement for the co-creation initiative? Yes

13A. Is the agreement formalized?

Yes

13B. Please specify the type of the agreement:

Creation of an independent new Scientific Cooperation Foundation (FCS foundation de cooperation scientifique) controlled by a Board of Directors (13 seats) and led by an Executive Committee. The agreement is described in the following documents:

- a) *b<>com's Status (signed by the Founding Members)*
- b) *b<>com's membership charter (signed by all the Members)*
- c) *Individual investment commitment (signed by each Member)*
- d) *A set of usual documents approved by the Board of Directors*

13C. Are legal issues related to the ownership of jointly developed IPRs settled in a partnership agreement?

All legal issues related to IPRs are settled in the membership charter. Each candidate member must approve this documentation to become an effective member.

14*. In case there is no agreement, please explain how partners' activities are coordinated?

14A*. Who is the owner of data from the co-creation initiative?

The co creation initiative (b<>com) is the owner of all the results and data. If the initiative ends, the remaining assets become the property of French public institutions. Nevertheless, intellectual property asset are guaranteed to remain accessible to the industrial members.

14B*. Who is the owner of IP from the co-creation initiative?

The co creation initiative (b<>com) is the owner of the generated IP assets. The members can of course buy licenses to operate these Intellectual Property Assets following frand (fair, reasonable and non-discriminatory) international rules.

15*. How is the process of accessing research results (for partners) organized?

As simple as possible:

- each project provides a continuously revised list of expected deliverables (reports, white papers, publications, technology ingredients (hardware and/or software), with related delivery dates and costs).
- interested partners get in touch with Marketing & Sales team to buy projects deliverables which are meaningful for them either for R&D only either for commercial purposes.

16*. How do you set the balance between data sharing and IP protection?

For each project, specific demands from members are taken into account before project launch and rules are set.

Confidentiality can range from public (open to the entire world) to project confidential (open to project investing members only).

Specific requests can be made to relax confidentiality rules. They must be made to the co-initiative CEO who is the only one allowed to take decision confidentiality-wise.

17*. Is public access to either co-creation results or products granted?

Yes, some of the project results, with a high level of maturity have a public access (doesn't mean free access). There are displayed on our web site. Specific demands from members are taken into account before projects are published.

18*. What types of intellectual property (IP) protection mechanisms are used (e.g., patents, trademarks, industry design, utility model, complexity)?

18A*. What types of IP are more important for your co-creation processes?

- *Patents and their related technology implementations;*
- *Patents (Pure IP);*
- *Software APP (legal deposit to Agence pour la protection des programmes);*
- *Technology ingredients and solutions both in Hardware and Software;*
- *Trademarks;*

b<>com also values the knowledge it creates, transferring educational contents to its academic shareholders to evolve their Degrees and Masters.

3. PROJECT EVALUATION

19*. Are milestones and key performance indicators (KPIs) set for the co-creation initiative?

Yes

If YES,

19A. Are they settled in a partnership agreement?

Yes, they are part of the General Strategy, projects & platforms, BP documentation

19B. Are they essentially qualitative or quantitative?

Both. They are related to the value the co-initiative expects to deliver: knowledge, impact & revenue

19C. Please provide the main KPIs (provide up to 5 indicators)

b<>com as a whole main KPIs are:

1/Members' investment

2/Technology transfer contracts

3/European Projects participation

4/International global Influence (Standardization/Open source communities/ industrial alliances leadership, Audience, Contact base)

5/Invention disclosures and Patents

20*. At what stages is the evaluation implemented? (Please choose all appropriate answers): Ex-ante / Interim / Ex-post / No evaluation procedure
2 types of evaluation are conducted

- "Every Year's evaluation" led by the French State Representatives under the leadership of the French National Research Agency (ANR).
- "Every 3 Years' evaluation" led by independent organizations and companies at the demand of the National Agency for Research (ANR).

Additionally, each year, the board of directors' Chairman and the CEO must present to the Territorial Strategic Orientation Council (COST) the significant events, the financial results and describe the co-initiative development in its various regional sites. Most of the documentation used for this presentation is the same than the one edited for the "every year evaluation".

For each evaluation stage, please, provide the following information:

20A. What approaches are used?

20B. What types of data are used?

20C. How is the evaluation process organized? Who is responsible for it? Are there any external evaluations conducted?

	Every year's evaluation	Every 3 years' evaluation
<i>Who is Responsible for</i>	ANR (with SGPI)	Hcéres and independent companies for ANR
<i>External evaluation</i>	Yes	Yes An expert evaluation committee is formed by the HCERES for the scientific evaluation
<i>How is the evaluation process organized</i>	<i>The co-initiative must provide :</i> <ul style="list-style-type: none"> - a yearly report - project reports (6 to 9 new projects per year ; 5 members average per project) - financial HR, Patents, Contracts, Publications data 	<i>The co-initiative must provide :</i> <ul style="list-style-type: none"> - a 3 year self-evaluation report - a yearly report - project reports - financial, HR, Patents, Contracts, Publications data
		A draft evaluation report is generated by the evaluation committee. It is based on the received documentation
	<i>A one day expert visit in the co-initiative premises for meetings, presentations and demonstrations</i>	<i>A three days' visit of the evaluation committee in the co-initiative premises for meetings, presentations and demonstrations (more than 75 people meet: employees, management, shareholders and ecosystem representatives). Part of it aims at answering to the evaluation report</i>

		A "Strategy and Positioning" analysis report as well as "Ecosystem Impact" evaluation report are generated by independent companies for the National Research Agency (ANR)
What types of data are used	<p>Reports and interviews:</p> <ul style="list-style-type: none"> *Research Project reports *Patents, Publications, White papers, international awards; *Standardization, open source and alliances leadership; *HR, PhD & PostPhD positions, Internship; *European Projects; *R&D contracts and POCs *Technology licences; *Arrival of new shareholders *Shareholders' investment 	<p>Reports and interviews:</p> <ul style="list-style-type: none"> *Strategy and Positioning evolution presentation; *Leadership quality; *Leadership team overall experience; *Research Project reports *Patents, Publications, White papers, international awards, *Standardization, open source and alliances leadership *HR, PhD & PostPhD positions, Internship *HR motivation, passion *European Projects *R&D contracts and POCs *Technology licences; *Arrival of new shareholders

21*. Are the evaluation results open (e.g. published on the website, reports, structured databases, etc.) or closed (used only for the internal goals)? If they are open, please specify.

The "every year's evaluation" result is confidential.

The "every 3 years' evaluation" Hcéres⁶ scientific report is Public and will be made available on the Hcéres web site (<https://www.hceres.fr/en>). The last every 3 years report which has been conducted in 2018-2019 by HCERES for its scientific part should be made available on the Hceres web site in the coming march 2021. The first 3 years report conducted by ANR in 2015-2016 is confidential.

22*. What are the implications of any evaluations conducted so far (e.g., revision of KPIs; suspension or termination of funding; penalties and rewards associated to performance)? Please explain.

The implications are:

- *Revision of the KPIs: increasing or decreasing them, adding new KPIs, removing some of them*
- *Revision of funding: increasing or decreasing or termination of funding. Definition of a probative time period (one year) to reach KPIs, demonstrate progress, reorganize, change leadership team... with potential termination of funding if not achieved.*

23*. What are the key success factors of this co-creation initiative?

Among the key success factors to be pointed out are:

- *Co-investment and not subvention: we share risks, failures and opportunities;*
- *Small size of the board (13 seats, chaired by Industry representative) to speed up decision making process easing and opening internal discussions;*
- *The co-initiative owns 100% of the developed IP assets (no joint ownership);*

⁶ Hcéres : Haut Conseil de l'évaluation de la Recherche et de l'Enseignement Supérieur (<https://www.hceres.fr/en>)

- *Delegation of leadership/management to an independent, skillful, experienced, committed team who has been specifically hired to lead the co-initiative (to remove any conflict of interest and increase involvement);*
- *Co-operation as a cornerstone to ease openness, mixing skills and developing team spirit and mutual respect on day to day basis: Research and Engineering (knowledge and know-how) to reach high Technology Readiness Level (up to TRL 8) when necessary. All the teams gathered Research and Engineering skills.*
- *Focus on efficiency and pragmatism to deliver economic results*

24*. Were there any challenges during the co-creation process? Please provide details and explain what caused them.

The main challenges were:

- *Find the agreement about created IP assets: obligation for b<>com to own 100 % of the IP asset developed during b<>com projects;*
- *Limitation of the Board of Directors number of seats and votes: 13 seats maximum for 32 shareholders for b<>com.*

25*. Based on your experience, what would you recommend to a new co-creation initiative for it to be successful? Please explain the main lessons learned from your experience.

Review the key success factors.

Define strong Milestones to make key decisions with potential exclusion from the following steps of the co-creation initiative

4. **THEMATIC FOCUS:** Co-creation's contributions to digital innovation and AI and effects of data sharing

- What are the ways in which the co-creation initiative features digitalization and AI? Please provide examples.

The co creation initiative's mission is to boost development and marketing of tools, products and services thanks to research and innovation in digital technologies.

It's a unique co-investment model that provides knowledge, know-how and technology to its shareholders and to various industry branches market players.

Targeted industry branches are:

- *Cultural & Creative industry;*
- *Telecommunications and Network Infrastructures industry;*
- *E-Health industry;*
- *Defense and Cybersecurity industry;*
- *Industry of the future.*

Opportunistically, other branches can be targeted. As a matter of fact, the key research topics deployed in the co-creation initiative have been selected because of their importance in almost all the branches. As a reminder, these research topics are:

- *Images and Sound Processing*
- *5G and beyond 5G Networks and Internet of Things (IoT)*
- *Cybersecurity*
- *Artificial Intelligence*
- *Augmented Reality & Virtual Reality*
- *Cognitive technologies and Human Factors*

In each of these research domains, the co-creation initiative put in place Software and Hardware engineering capabilities in order to minimize cost and time to market integration for the co-creation initiative customer.

Among the major examples under the b<>com initiative:

The co-creation initiative is the first in France, and one of the rare 5G Test operator, with deployments of its own 5G core network in Europe (H2020 5G eVe Project). This aims at boosting understanding of 5G Core Networks benefits vs. 4G Core Networks.

The co-creation initiative (mainly the academic members of the area) contributed to the co-creation of a Master 2 called "Digital Transformer", aiming at giving indifferently to students and professionals from all disciplines a high level of understanding of what means digitalization (technical, legal, ethic, human, change management, ...). It provides them knowledge and tools to conduct change in the industry and in public organizations. University of Rennes 1 organizes and delivers the Master on behalf of most of the academic universities and schools of the area.

Artificial Intelligence is used in all the above-mentioned research topics. Several examples are given on the web site (<http://b-com.com>). Image processing for Standard Dynamic Range (SDR) to High Dynamic Range (HDR) images conversion, gaze detection mechanisms, authentication fault management for cybersecurity applications...

Cognitive load assessment: measuring stress encountered by operators in specific conditions thanks to physiological sensors signal processing.

5G Network orchestration based on AI principles as well as 5G Networks resilience to AI attacks.

- What are the roles of stakeholders? Are they different from traditional ones? Please provide examples.

The shareholders' role is original as they provide the co-creation initiative project with skillful people who would be mixed with co-creation initiative employees to reach expected critical sizes in targeted areas.

Of course,

- *They provide Use cases*
 - *They contribute to the projects' definitions*
 - *They provide specific means (specific sites to receive 5G antennas for instance, ...)*
 - *They test the innovations with their customers (Surgery Operation room for a world first on Dicom Real Time Video in January 2019)*
- How are data sharing and intellectual property protection organized? Please provide details.

In most of the cases, data, project results are made accessible to the different shareholders. In some specific cases, data and project results are made accessible to project contributors and not to the other shareholders. This has to be requested before the project validation by the board.

All the IP assets generated by the co-creation initiative are 100% belonging to the co-creation initiative.

- What are your best practices? What would you recommend to new co-creation project involving digital innovation and AI?

1/The rules about IP assets management: 100% of the produced IP assets belong to the co-creation initiative avoiding all non-lasting project by project consortium agreement discussions.

2/The limited and small size of the board (13 seats) which clearly allows and ease discussions about investments and strategy, strengthens the ties between the shareholders;

3/The attention paid at avoiding potential conflict of interest (b<>com Managers must be employees of the co-creation initiative and cannot have any tie with shareholders).

5. POLICY CONTEXT

26*. Was the initiative supported by a specific policy initiative? If so, please provide details on the policy initiative and type of support provided (e.g. amount of funding, conditions of support, selection criteria, reporting obligations, etc.).

Yes, the co-creation initiative is supported by the French "Programme d'investissements d'avenir" (PIA) led by the SGPI.

8 Institutes of Technology or IRT⁷ (co-creation initiatives) were created in 2012. They had to answer to a Call for expressions of interest (25 ecosystems did it). Then they had to answer to a request for proposal (15 ecosystems did it). 8 candidate ecosystems were awarded by an international jury.

The co-creation initiative, b<>com, which is described in this report, has been granted 80M€ of funding for 10 Years by the French Government. This means b<>com has been able to convince the jury that the shareholders and the co-creation initiative would be able to bring another 80M€ over the same 10 years' period.

The selection criteria were:

- *the business plan,*
- *the strategic interest of the related field of research,*
- *the reputation and the size of the ecosystem,*
- *the ecosystem innovation background,*
- *the ambition of the projects proposed by the ecosystem,*
- *the ecosystem capacity to develop and manage IP assets,*
- *the project leader ability to launch the project.*

The reporting obligations have been described previously.

27*. What are the factors (e.g. related to regulations, policy, business environment etc.) supporting and/or hindering co-creation in your country? Please explain.

Hindering factors

- *National labour policy is complicated: it is complicated for a shareholder to have its employees working for another structure*
- *The number of different regulations to respect : European, French, ISO,*
- *Getting subventions on collaborative projects at national level is rather easy, lowering co-investment strategies*

Supporting factors

- *The "Programme d'Investissements d'Avenir" which promotes co-investment is something unique which has been proposed by 2 former Prime Ministers Alain Juppe and Michel Rocard.*
- *New paradigms because of AI, because of cybersecurity needs, because of sovereignty needs: all being strong arguments to have the members of a single ecosystem gathering their work forces to reach critical size, to reduce cost, to share opportunities.*

28*. What do you think are most effective types of policy support for co-creation?

Co-investment: we invest with you 1€ from State for 1€ from the related ecosystem

Ex post evaluation: define less than 15 key performance indicators and manage them over time

State Global initiative: is not under the support/control of one ministry, but under the support/control of a joint ministerial group or agency, ideally attached to the Prime Minister, as the SGPI is.

⁷ IRT : Institut de Recherche Technologique – Institute of Technology (<https://www.french-institutes-technology.fr/lassociation-fit/>)

-----CASE STUDY AUTHOR -----

Name:	Bertrand GUILBAUD
Location (country):	France
Affiliation:	b<>com (IRT)
Your role in the co-creation process:	Project Lead
Your main activities in the co-creation process:	vision, strategic positioning definition, governance, legal, business plan, fund raising (shareholder’s enrolment), documentation, ...