BELLA II
Building the Europe Link to Latin America and the Caribbean

EU-CELAC SUMMIT WORKSHOP:
STRATEGIC DIALOGUES FOR THE DEVELOPMENT OF THE DIGITAL ECOSYSTEM FOR THE EDUCATION, RESEARCH AND INNOVATION IN LATIN AMERICA AND THE CARIBBEAN

Red CLARA
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EU-CELAC Summit Workshop:
Strategic dialogues for the development of the digital ecosystem for the
education, research and innovation in Latin America and the Caribbean

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1. Executive Summary

The workshop **"Strategic dialogues for the development of the digital ecosystem for education, research and innovation in Latin America and the Caribbean"** carried out by RedCLARA, took place within the framework of the activities conducted during the celebration of the **III European Union-Community of Latin American and Caribbean States (EU-CELAC) Summit** in Brussels between July 17 and 18, 2023. This workshop was an action associated with the BELLA II Project, whose overall objective is to **strengthen and expand the digital ecosystem of Latin America and the Caribbean (LAC), facilitating relations and exchanges between Latin American and European companies, research centers, educational institutions, and academic networks, to contribute to the achievement of the region's strategic objectives focused on strengthening education, science, technology and innovation.**

RedCLARA's digital ecosystem constitutes, within the framework of the digital ecosystem of Latin America and the Caribbean, a dynamic and active digital space conceived with the intention of operating from the connectivity pillar proposed by the EU-LAC Digital Alliance. It is a space that will be developed during the implementation of the BELLA II project and that will connect LAC countries to a dedicated and secure digital network that will facilitate the use of available resources, capacities and skills by governments, businesses, and civil society to promote economic and social development in the region.

The RedCLARA digital ecosystem will function as an ecosystem driven by **meaningful and purposeful connectivity**, **data**, and will be **human-centered**. As such, it will constitute a dynamic and interconnected network where connectivity, data and social actors play a central role in the search for solutions to the challenges of the digital economy and the knowledge society.

During the design and preparation process for the workshop held on July 18, a series of primary and secondary research activities were carried out to provide participants with usable information in the context of the strategic dialogues held. The execution of the workshop per se, involved the participation of 45 experts distributed in **five working tables** related to five strategic axes: **Sources of Funding, Governance, Role of National Research and Education Networks, Role of Governments and National Innovation Agencies, and Connectivity and Data**.

This report includes both the contributions of ideas, experiences, information, and knowledge made by the participants in the workshop, as well as the contributions of the experts who were the subject of the semi-structured interviews. The main conclusions, recommendations and contributions generated are described below:

- **Financing Strategies:** from the perspective of the international financial organizations, the adoption of financing strategies for two types of projects A and B was recommended. The former are proposed as part of the negotiation strategies between the countries and the international banking system for projects with broad regional coverage and great depth and impact. Type B projects refer to financing strategies for initiatives directly related to the scope of Bella II to connect Central America and PERU, and the other countries that comply with being backbone projects to connect academic or research networks in LAC. From the perspective of the NRENs, it was suggested that there is a need for warning systems on

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funding sources and the adoption of negotiation strategies to influence the creation of public funds to enable regional and international programs and projects.

- **Governance:** RedCLARA digital ecosystem governance was proposed to be implemented in two stages. The first was conceived as a transition stage in which work teams were created in the countries involved and the portfolio of programs and projects to be undertaken was defined. The second related to the empowerment of the teams in the countries to execute the agreed projects.

- **National research and education networks and R&D organizations:** it was suggested that NRENs and R&D organizations should fulfill three key functions within the RedCLARA digital ecosystem: (i) to contribute to the development and strengthening of the necessary digital infrastructure, (ii) to be involved in the design and construction of test beds to demonstrate feasibility before scaling, and (iii) to contribute to the strengthening and revitalization of innovation and business ecosystems enabled by the RedCLARA Digital Ecosystem.

- **Governments and agencies promoting socioeconomic and technological development:** the need to involve governments and innovation agencies in the process of executing the strategic dialogues was raised, given the extraordinary role they play, both in the regulatory framework facilitating the operation of ecosystems and in financing the necessary public policies, as well as in the dynamization of the systemic relationships considered strategic.

- **Meaningful connectivity and data:** it was suggested that the data space being conceived by RedCLARA will foster collaboration and innovation**,** allowing stakeholders to work together on projects related to both the generation of data and the development of a platform for sharing knowledge, experience and resources on topics and areas of knowledge of common interest. This includes aspects such as data governance, data cybersecurity, data space infrastructure, and the design and implementation of data collection and storage processes.

The main text of this report discusses in detail the approaches taken on the conclusions and recommendations described above. Taken as a whole, the recommendations made by the working groups allowed for an analysis of their implications on the role of RedCLARA's digital ecosystem in the context of the digital ecosystem in Latin America and the Caribbean.

In addition, the recommendations, combined with the trends and uncertainties identified during the semi-structured interviews, were used to develop four scenarios described in the report: **ideal gearing, constructive dialogues, slow awakening, and every man for himself**. The work with the scenarios generated will contribute significantly to the structuring and continuity of the open strategic dialogues that are being carried out in the framework of the implementation of the BELLA II project. Specifically, in the creation of a communicational space in which stakeholders, from their respective spheres of influence, commit to the creation of enabling conditions for the regulatory framework, strategies for access to funding sources and empowerment of organizations, institutions, individuals, and communities that will make possible the desired social and economic transformations.

The report concludes with the section **"Final approaches and recommendations related to coordination and linkages with other pillars of the Alliance and the European Commission"** in which a set of

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recommendations are made regarding the necessary strategies to ensure the continuity of the strategic dialogues and the BELLA II project within the framework of the four pillars of the EU-LAC Digital Alliance.

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2. Introduction

The workshop **"Strategic dialogues for the development of the digital ecosystem for education, research and innovation in Latin America and the Caribbean"** was held within the framework of the activities carried out during the celebration of the **III European Union-Community of Latin American and Caribbean States (EU-CELAC) Summit** in Brussels on July 17 and 18, 2023. This workshop was an action associated with the BELLA II Project, whose overall objective is to **strengthen and expand the digital ecosystem of Latin America and the Caribbean (LAC), facilitating relations and exchanges between Latin American and European companies, research centers, educational institutions, and academic networks, in order to contribute to the achievement of the region's strategic objectives focused on strengthening education, science, technology and innovation.**

The BELLA II project, implemented by **RedCLARA, the Latin American Cooperation of** Advanced **Networks,** is part of the **digital alliance between Europe and Latin America and the Caribbean**, an initiative that consists of four main pillars: **connectivity, investment acceleration, policy dialogues and the Copernicus program.** This is an unprecedented effort between the two regions to bridge the digital divide and support digital transformation processes.

RedCLARA is responsible for development of the connectivity pillar. To this end, the BELLA II project will connect LAC countries to the **RedCLARA digital ecosystem** composed of universities, research centers and large research infrastructures, national research and education networks, companies and other organizations in LAC and Europe. This will allow the construction of a dedicated and secure digital network that facilitates the use of available resources, capabilities and competencies by governments, businesses, and civil society to promote economic and social development in the region.

The RedCLARA digital ecosystem, which will be consolidated during the implementation of the BELLA II project, will be driven by **meaningful and purposeful connectivity**, **data**, and will be **human-centered.** As such, it will constitute a dynamic and interconnected network where connectivity, data and social actors will play a central in its functioning and operation.

Meaning is a complex and multifaceted concept that refers to various aspects of relationships between people, communities, organizations, and institutions. In the case of BELLA II, the search for meaning and purpose will be related to questions such as: how could digital transformation technologies contribute to the socio-economic development of the region? How could the connectivity provided by BELLA II be applied to foster collaboration, communication, co-production of value and co-creation of innovations among stakeholders? How could connectivity between different devices, systems and data be collected and analyzed in real time, enabling more informed decision making and better overall ecosystem performance?

These and other questions were raised and addressed during the process of conducting the dialogues that took place in the workshop. During the dialogue process, the organizations and people invited thought together or in a shared manner, not only in the sense of analyzing and seeking solutions to a problem of common interest, or creating new knowledge, but also in the sense of enabling processes of collective intelligence, where the resulting thoughts, ambitions, expectations, and actions do not belong to an individual but to the team or group. In this sense, dialogue was a valuable tool to energize, in a space where a diversity of actors converged, the processes of creating a shared vision, socialization, exchange

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of mental models and stimulation, exploration and experimentation with distributed collective intelligence.

The contributions made by the workshop participants will serve as a springboard for the consolidation of the process of reflection, ideation and collective generation of solutions that could be implemented thanks to the sharing of resources and capacities that stakeholders already possess, combined with those that need to be developed, to give birth to the vision of the desired socio-economic transformation.

The purpose of this report is threefold: (i) that of providing information to stakeholders who participated in the workshop on the conclusions reached at the five working tables; (ii) that of informing stakeholders located at the macro, meso and micro levels of the strategic vision, knowledge and systems thinking of organizations and individuals with considerable influence and decision-making authority; and (iii) that of using the contents of the report as a starting point for structuring future strategic dialogues that will generate the solutions necessary for the achievement of the overall objective and specific objectives of the BELLA II project.

The report consists of five sections in addition to this one, which include: the working methodology used to conduct the workshop, the results produced by the five working groups, the implications of the contributions generated by the stakeholders from the perspective of the BELLA II project, the possible scenarios for action, and the approaches and recommendations necessary for the continuity of the BELLA II project.

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3. Work Methodology

The elements of the methodology followed during the conduct of the workshop within the framework of the EU-LAC Summit are summarized in Table 1 below.

Table 1: Methodology for conducting the workshop			
The meaning of the dialogues: Dialogues based on the ideas of Bohm, Williams and Yankelovich are characterized by their emphasis on open and meaningful communication, deep listening and collective exploration of complex issues.		**Expected behaviors** • Suspend the trial. • Active listening. • The exploration of new forms of communication. • Inquiry and reflection.	
The Strategic Axes on which the dialogue process will focus			
Education and Research	**Financing**	**Human-centered Digital Transformation**	**Governance**
How can universities and RNEIs contribute both to the training of human talent and to the generation of solutions to the challenges of human-centred digital transformation?	How to develop, based on a systemic approach, more effective financing strategies than those traditionally deployed to access funds for program and project implementation?	How can the BELLA II project contribute to the application of digital transformation technologies to the development of solutions that place the needs of people, communities and organizations at the center of the process?	How to innovate in the governance process to ensure inclusiveness, as well as greater efficiency and effectiveness in the implementation of agreed programs and projects?
Preparatory activities carried out: The workshop was conducted according to the Topic Focused Methodology developed by Ruth Cohn. For this purpose, the following activities were carried out: • Semi-structured interviews with stakeholders of recognized prestige and experience • The generation of an informative document based on the processing of ideas and knowledge expressed and shared by the interviewees prior to the workshop. • The selection of the nominal group technique as the method used during the group dynamics followed during the workshop. • The generation of a report summarizing the main conclusions of the workshop.			
The list of workshop participants and the list of stakeholders who were interviewed in a semi-structured interview can be found in Annex 1.			

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4. Results of the dialogues at the Working Groups

The dialogue process within the workshop was conducted in five working tables among which the 45 participants were distributed in order to facilitate a process of reflection on the five strategic axes listed in Table 2.

Table 2: The strategic axes on which the open strategic dialogues workshop was held within the EU-LAC Summit
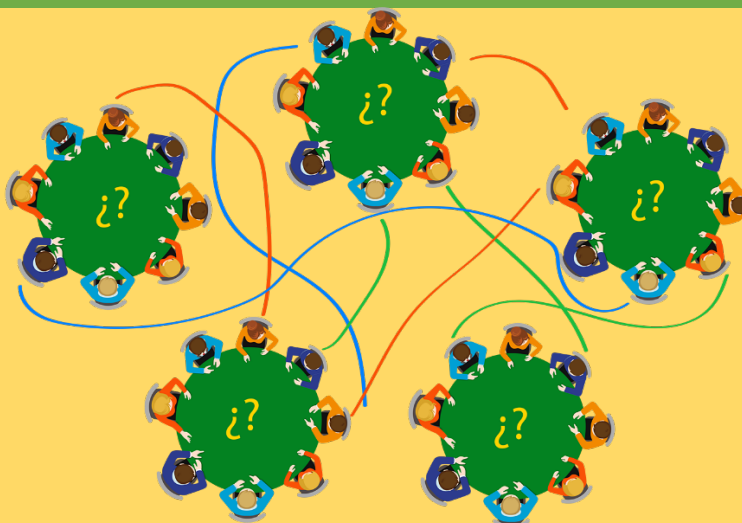
Strategic axes:

1. **Funding sources:** conceived with the intention of identifying both the possible sources of funding for the selected digital programs and projects, as well as the strategies for accessing them (**Working Table 1**).

2. **Governance of the RedCLARA Digital Ecosystem:** oriented towards the process of delegation of roles, formalization of responsibilities and coordination among stakeholders that will create the conditions for the achievement of the general objective and specific objectives of the BELLA II project (**Working Table 2**).

3. **Role of NRENs and R&D&I organizations within the RedCLARA ED**: aimed at exploring and specifying the ways in which the resources, capabilities, and competencies of NRENs will contribute to the dynamization and strengthening of the digital ecosystem (**Working Table 3**).

4. **Role of Governments and Innovation Agencies:** to define the strategies for interaction with the governments of the region that will contribute to the generation of the regulatory framework, public policies, and financing instruments necessary for the successful implementation of the BELLA II project (**Working Table 4**).

5. **Connectivity and data:** dedicated to the process of thinking about the ways in which meaningful, purposeful, data-driven, human-centered connectivity will enable the processes of value co-production and co-creation of the innovations demanded by the execution of the BELLA II project (***Working Table 5***).

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4. 1 Working Table 1: Strategic Axis Sources of Financing

The BELLA II project seeks to expand meaningful connectivity and contribute to the development of the RedCLARA digital ecosystem, a bicontinental socioeconomic space in which education, science, technology, innovation, research and knowledge management are placed at the service of the search for solutions to society's challenges. The transformative potential of the RedCLARA ecosystem can be extraordinary, however, to build it, appropriate financial resources are needed. Working Table 1 analyzed the problem of financing digital ecosystems. The members of this table, as well as the question that was considered during the workshop are presented in Table 1.

Table 1: Workshop participants and the question under reflection
Participants:
1. Mauricio Agudelo (CAF)
2. Oscar Barrios (BID-LAB)
3. José Manuel Otero (EIB)
4. Juan Gorriño (EIB)
5. Lorena Gómez Gaviria (Nokia)
6. Raúl Amaya (Specialist)
7. Luis Eliécer Cadenas (RedCLARA)
The question:
What proven financing models could be applied to secure access to funds to enable the implementation of programs and projects identified during the strategic dialogues, and what financial innovations would you suggest to implement the disruptive innovations to be generated by the BELLA II project?

The members of the roundtable, based on their direct and indirect experience with various financing mechanisms, agreed that enabling digital ecosystems may require significant financial resources, and that the deployment of appropriate financial strategies is essential to ensure the continuity and sustainability of the ecosystem. In Table 2 we present a summary of the financial strategies that were suggested, both by the workshop participants so that they could be implemented in the short, medium and long term, and by the people who could not attend the workshop, who made significant contributions in the semi-structured interviews.

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Table 2: Financing strategies of the RedCLARA digital ecosystem

Banca y organismos multilaterales:

- The adoption of funding strategies for two types of projects A and B was recommended. Type B refers to funding strategies for initiatives directly related to the scope of Bella II to connect Central America and Peru, and the other countries that comply with being backbone projects to connect academic or research networks in LAC.

- Type A projects are those that are not the direct objective of RedCLARA and BELLA II, but seek to solve the digital divide and improve connectivity to specific groups or regions. These are comprehensive projects, much broader and more ambitious than those proposed so far. In this sense, they include connectivity to countries not yet contemplated, including other capacities such as connection and expansion of computing and data management capacities, among others. Financially, this project could be proposed at the regional level through investment banking.

- It was recommended to explore the option of RedCLARA participating financially in a type A project, provided that a SWAP can be made for backbone capacity of a B project.

- The possibility of a financial backing or guarantee for the development of some of the type A projects, by banks such as the EIB with direct backing funds from organizations such as CAF, was considered, an issue that is apparently already under discussion.

- The EIB asked to have defined how and who will generate the income for the payment of the eventual loan in which they participate.

- EIB reported that the smallest projects in which they are involved are 50 million Euros.

- CAF also proposed to evaluate the B project and participate directly without the need for a capacity exchange.

- It was recommended that advantage be taken of the presence of the ministers of finance on the boards of directors of the banks to promote regional agreements and not only at the national level.

- Seek mixed financing models that can bring in other potential investors from private banking, government banking support, venture capital funds and others.

Universities, National Research and Education Networks, and R&D&I organizations:

- Explore access to funding sources such as grants, subsidies, and government incentives available so that universities, NRENs, research institutes can contribute to the development of solutions to overcome the challenges generated by the digital transformation.
- Participate in the processes of design, implementation, assessment, and evaluation of public policies carried out by innovation agencies conceived with the purpose of dynamizing and strengthening the digital ecosystems of innovation, business and science and technology.
- Access funds created by state agencies for the promotion of socioeconomic development in order to encourage the development of human talent by promoting training programs and workshops to improve the skills and capabilities of agents involved in the co-production of value and co-creation of innovations within the digital economy.

- **Access funds for the incubation, by universities and R&D&I organizations of technology-based companies developed from the exploitation of research results on specific topics of digital transformation.**
- To conceive and implement, on the part of the NRENs, strategies for commercialization or monetization of knowledge and technologies based on the processing of big data to meet the challenges of the digital economy.

Private Sectors:

- Explore the possibilities of accessing funds from companies committed to stakeholder capitalism or shared value whose strategic vision links them to innovative digital projects that have a positive social, environmental, or economic impact.

- Negotiate agreements between leading digital companies in Europe and LAC to create and access funding sources for the construction and habitation of testbeds, living labs, and digital labs that enable both prototyping before final scale-up and exposure to small and medium-sized companies interested in staying at the forefront of digital transformation technologies and their applications.

- Promote university-business partnerships around two initiatives: (i) the incubation of digital companies formed from the exploitation of data and the co-creation of digital innovations, and (ii) the formulation, negotiation and execution of R&D&I projects that enable knowledge management, the joint development of technologies, and the realization of business models that enable access to new markets within the digital economy.

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4.2 Working Table 2: Strategic Axis Governance

The dialogic workshop on the governance of the digital ecosystem RedCLARA was based on the recognition of the importance of both the multidisciplinary and multi-institutional perspective of the need for inclusive processes to facilitate decision-making during the implementation of projects of extreme social and technological complexity. In other words, it was a dialogue that sought to transcend organizational boundaries, bringing together policy makers, technologists, academics, financial institutions, civil society representatives and industry leaders. During the dialogue, active listening and respect for diverse points of view made it possible to collectively identify gaps, share best practices and jointly design governance frameworks that prioritize the interests of all organizations involved. Table 3 lists the names of the individuals who acted on behalf of their respective organizations and includes the question that triggered the strategic thinking process.

Table 3: Workshop participants and the question under reflection
Participants:
1. Peter Koren (DG INTPA EC)
2. Mariana Navarro (Telxius)
3. Mathilde Maury (Nokia)
4. Laura Zurdo Maroto (Nokia)
5. Rafael Castell Lucia (Telxius)
6. Arturo Martín (Specialist affiliated with RedCLARA)
7. Fabio Panunzi Capuano (TI-Sparkle)
8. Raúl Katz (Specialist affiliated with RedCLARA).
The question:
Which are the key challenges and opportunities in digital ecosystem governance, and how can we leverage dialogue and collaboration to effectively address them?

The definition of RedCLARA's digital ecosystem governance, in accordance with the proposals made in the White Paper, should lead to: (i) internal rules of coordination and relationship between the actors that share the responsibility of achieving the general and specific objectives of BELLA II; (ii) agreements regarding the meta-national, national and regional strategies to be deployed by institutions, business associations, universities, civil organizations and other interested agents to ensure the necessary resources for the execution of the project, and (iii) the involvement of the actors in the participatory processes of co-production of value, and co-creation of innovations supported by the design and implementation **of public policies and private initiatives** aimed at promoting socio-economic development in LAC.

The contributions made by Working Table 2 not only contributed to the enrichment of the approaches made in the White Paper, but also included organizational innovations whose implementation will improve the efficiency and effectiveness of the roadmap associated with the governance of the RedCLARA digital ecosystem. Table 4 presents a summary of the contributions made by Table 2, structured according to the two stages identified by the participants: the **establishment of priorities and determination of objectives**; and the **construction of the formal governance system**.

Table 4: Strategies for the governance of the RedCLARA digital ecosystem
First stage: Establishment of priorities and determination of objectives
This stage would be associated with the first year of implementation of the open strategic dialogues and is key to create the conditions that would allow laying the foundations for the governance of RedCLARA's digital ecosystem built under the premises of being user needs-centered, data-driven and guided by a human-centered vision of digital transformation technologies. The activities associated with this first stage identified by the working table were: **The generation of a matrix, country by country, prioritizing according to their impact and value produced, the topics that would be the object of the RedCLARA digital ecosystem.**   **Produce a stakeholder map that identifies their resources, capabilities and competencies and generates information on their vision of the RedCLARA digital ecosystem.**   **Produce, country by country, a set of general and specific objectives differentiated according to the issues prioritized in the matrix generated.**   - Develop an action plan specifying the short-, medium- and long-term roadmap for achieving the agreed general and specific objectives.
Second stage: The Formal Governance System
The formal governance system will provide the communication space for interactions between key stakeholders (government officials, business representatives, national research and education networks and academia) and will contribute significantly to the alignment with the purpose, values and objectives of the RedCLARA digital ecosystem. In other words, the precision of the roles that will be played by the stakeholders, the delegation of responsibilities and the coordination mechanisms necessary for the fulfillment of the different tasks. The activities associated with this second stage identified by the working group were: - The creation of a central or governing governance entity that assumes the leadership and responsibility for monitoring the progress of the project and the achievement of objectives (quarterly).   - The formation of a technical/financial support group that functions as the executing arm of the central entity and whose responsibilities include: project management, interim and final evaluations of the action plan's execution, and submitting contingent situations with proposed solutions to the central entity.

In parallel with the implementation of the BELLA II project governance by the central entity, Working Group 2 proposes the creation of local governance groups in each country, whose functions and responsibilities would include the following:

- A clear focus on achieving the objectives of the local projects conceived during the implementation of the open strategic dialogues.

- Adopt a pragmatic approach during project execution, which implies identifying the key agents or players for each strategic area and providing them with the necessary support so that they can apply their resources, capabilities, and competencies to the development of solutions that facilitate the achievement of the objectives.

- Leverage, for the execution of the project, bridge institutions such as NRENs, universities, technology parks, etc., which could play, in each country, the role of coordinating the activities undertaken.

- In each country, the groups should operate in accordance with its social, economic and technological reality, and in harmony with its culture.

- In each country, the team formed will adopt, internally and as far as possible, an organizational structure similar to that of the central entity: technical and economic follow-up and monitoring and evaluation of the achievement of country objectives.

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4.3 Working Table 3: Strategic Axis role of research and education networks, universities, and R&D&I organizations within RedCLARA DE

The dialogic workshop on the roles of universities and R&D organizations within the RedCLARA digital ecosystem was based on the recognition of the importance and relevance of universities and R&D organizations, both in terms of training human talent and generating technologies and knowledge production necessary to respond to the challenges of the digital economy and the knowledge society. During the workshop, representatives from universities, NRENs and other stakeholders reflected on the importance of forging strategic alliances, establishing open innovation platforms and fostering knowledge transfer to address complex challenges in areas such as sustainability, digital inclusion and social impact. Table 5 lists the participants and describes the question that prompted the roundtable's reflections:

Table 5: Workshop participants and the question under reflection
Participants:
1. **José Palacios (REUNA- Chile)**
2. **Daniel Méndez (Innovation Secretariat- El Salvador) + 2 Assistants**
3. **Luis Furlán (RAGIE - Guatemala)**
4. **Juan Pablo Carvallo (CEDIA- Ecuador)**
5. **Christina Camacho (Minister - Embassy of Ecuador to Belgium and Luxembourg)**
6. Erick W. Contag (Specialist affiliated with RedCLARA)
The question:
How can universities leverage digital technologies to enhance learning experiences, foster digital literacy, and conduct the research and development required for the BELLA II project to meet the goal of driving innovation, entrepreneurship, and ethical use of digital transformation technologies?

Workshop participants agreed that the accelerated advance of digital technologies and social change require universities and research and development institutions to make extraordinary efforts to contribute to the search for solutions to the challenges of socioeconomic development in the digital era. Addressing these challenges requires both a strategic vision of the new role of the university and the development of knowledge, methods, techniques, and tools to act in an agile and effective way on the processes of co-production of value and co-creation of innovations enabled by digital ecosystems such as the one being generated by RedCLARA.

As a consequence of the above, it was posited that universities and research institutions must embrace change, foster a culture of entrepreneurship and cultivate strong partnerships with industry, government and the community at large to thrive in the knowledge economy in general and the digital economy in particular.

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The contributions made during the reflections shared at Working Table 3, as shown in Table 6, touched on: (i) aspects related to digital support infrastructure, human talent training, knowledge management, and innovation in education models; and (ii) relations with other social systems within the RedCLARA digital ecosystem environment.

Table 6: Role of research and education networks, universities and R&D&I organizations within the RedCLARA digital ecosystem

Infrastructure, training and knowledge management:

- **Boosting the Digital Ecosystem**
  - Strengthen RedCLARA and the RNIE to reach all schools in the region (continue building infrastructure).
  - Human capital development
- **Addressing end-user needs in order to reduce the digital divide**
  - Develop digital literacy programs
  - Develop programs and technology investment
    - (e.g., one tablet/laptop per student)
- **Create knowledge hubs**
  - Develop a distributed cloud/data repository infrastructure to share knowledge
    - Best practices.
    - Policies.
    - Pilot projects.
    - Etc.
  - Positioning universities as digital centers
- **Strengthening the digital infrastructure**
  - Robust architecture with diverse paths to minimize points of failure
    - Build on this infrastructure for healthcare systems, e-government, etc.
- **To develop the digital ecosystem through collaborative projects.**
- **Define clear catalysts to elevate the region, such as:**
  - Language (English)
  - Extend networks to the "middle mile" and "last mile" (e.g. Amazonia Conectada).
  - Sharing Best Practices
- **Supporting the development of a new education model**
  - Educating educators in the use of digital technologies
  - Developing digital school models
- **Deepening Regional Cooperation**

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- o   Develop partnerships with industry and government
- o   At the academic level:
    - ▪   Teacher exchange
    - ▪   Student exchange
    - ▪   Regional certificates
- o   Establish regular follow-up meetings
- **Financing.**
    - o   Align funding strategies with innovation projects and the needs of countries and the private sector.
    - o   Clearly communicate how to access Global Gateway funds as well as multi-lateral banking.

Relationships with other social systems within the RedCLARA digital ecosystem

In addition to their direct contributions, universities and research organizations should act as opinion leaders and advocates for ethical and responsible digital transformation. Their research should contribute to: (i) measuring the social impact of digital technologies and exploring the ethical implications of the use of data, artificial intelligence and other transformative technologies; (ii) participating in the strategic dialogues that are necessary to facilitate, through their relationships with governments, businesses and civil society, that the RedCLARA digital ecosystem functions in a sustainable, inclusive and aligned way with the most relevant values of society; and (iii) contribute, at the micro level, in the processes of formulation, negotiation and implementation of projects necessary for the generation of science, technology and knowledge necessary to carry out the processes of co-production of value and co-creation of innovations.

The following is a summary of the contributions on this strategic axis made at the workshop, and also incorporates some of the approaches expressed by leaders of the Banking Sector, Multilateral Organizations, National Research and Education Networks, and connectivity provider companies that participated in the semi-structured interviews preparatory to the generation of the support materials used in the workshop.

- **Testbeds:** Testbeds are initiatives that will enable universities to apply theoretical knowledge and research results in practical settings. By creating physical spaces that mimic real-world environments, universities can evaluate the effectiveness and impact of digital technologies, educational approaches and innovative solutions. The test beds will contribute to improved understanding of the complexities involved in digital transformation and fosters the development of practical skills.

- **Data spaces**: universities must lead data connectivity and interoperability among the digital ecosystem so that they can focus on carrying out their teaching and research activities without losing focus on their core activities, delegating everything related to connectivity and information hosting to the provider companies.

- **Research and innovation:** Universities are centers of research and innovation and can contribute to the co-production of value by conducting cutting-edge research, developing new technologies and creating knowledge assets. Universities should engage with other ecosystem participants to co-create innovative solutions and address complex challenges.

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- **International collaboration:** universities and NRENs should take advantage of the RedCLARA digital ecosystem**,** and the opportunities offered by the EU-LAC Digital Alliance to carry out joint research and development projects, technology transfer, knowledge management and startup incubation and other initiatives capable of contributing to the socioeconomic development of the region.

- **Entrepreneurship and startups:** universities can contribute to fostering an entrepreneurial ecosystem by supporting student startups, providing incubation and acceleration programs, and offering mentoring and funding opportunities. This can contribute to the creation of new ventures that provide, within the digital economy, innovative solutions that foster the co-production of value and the co-creation of innovations in the RedCLARA digital ecosystem.

- **Think Tank:** Universities can act as thought leaders in shaping the direction of the digital ecosystem. Through research publications, policy advocacy and thought leadership initiatives, universities can influence the governance, ethics**,** and sustainability of the ecosystem, contributing to the overall value creation and well-being of the ecosystem.

In summary, in the RedCLARA digital ecosystem, universities and R&D organizations will act as talent and skills development centres. In that sense, they will provide education and training in areas such as computer science, data analytics, artificial intelligence, and other emerging technologies, producing a skilled workforce that is essential for the digital transformation of industries. Through academic programs, workshops and industry partnerships, universities equip students with the knowledge and skills needed to excel in the digital age. In addition, they encourage lifelong learning and continuous skills enhancement to ensure that professionals remain adaptable and competent in an ever-evolving digital landscape.

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4.4 Working Table 4: Strategic Axis: Role of Governments and Agencies promoting social, economic and technological development

At the international level, the ***role of governments and agencies promoting social, economic and technological development*** in the promotion of digital ecosystems is multidimensional. These dimensions include: (i) the design and implementation of public policies defining the regulatory framework and the instruments and mechanisms enabling socioeconomic development; (ii) financial support for programs and projects that generate the science and technology needed to promote social, scientific and technological development; (iii) the gender perspective and citizen protection; and (iv) the creation of an enabling environment for innovation and business models to flourish. The performance of each of these roles is crucial to facilitate the growth and consolidation of digital ecosystems and boost the competitiveness, productivity and innovative capacity of countries and regions.

At table 4, the participants listed in Table 7 reflected, from the perspective of the RedCLARA digital ecosystem, on the role that such agents can play in the BELLA II project.

Table 7: Workshop participants and the question under reflection
Participants: 1. **Luis Oliva (AIG)** 2. **Martin Sarango (PCM)** 3. **Eduardo Ortega Barría (SENACYT)** 4. **Fátima Rodríguez (Innovation Secretariat- El Salvador)** 5. **Mark Urban (RedCLARA)** 6. **Ulrich Weins Service (European External Action EEAS)** 7. **Leonie Schellerhof (GIZ)** 8. Jean-Marie Chenou (Expertise France)
The question:
How can governments effectively govern and regulate digital ecosystems to promote innovation, ensure digital inclusion, and address emerging challenges such as data privacy, cybersecurity, and ethical considerations?

The contributions made during the reflections shared by the stakeholders who participated in the dialogue that took place at Working Table 4 produced, as shown in Table 8, a great diversity of ideas and potential solutions that will be very useful for the continuity of the open strategic dialogues that will conclude in 2024.

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Table 8: Strategic Axis: Role of Governments and Agencies promoting social, economic and technological development

Public policy dimensions and strategies to support the digital ecosystem:

- **Policy and regulation**: governments should play a crucial role in establishing the policy and regulatory frameworks governing the digital ecosystem. This would contribute to the creation of an enabling environment for innovation by ensuring fair competition, protecting intellectual property rights, and establishing data privacy and cybersecurity laws. Clear and supportive policies foster trust among ecosystem participants, encouraging investment and collaboration. Governments must strike a balance between enabling innovation and ensuring consumer and business protection.

- **Funding and investment**: Governments and innovation agencies can provide funding and financial support to digital ecosystem initiatives. This should include grants, subsidies, tax incentives and investment in research and development. By providing financial support, governments would help stimulate innovation, foster entrepreneurship and help start-ups and small businesses grow.

- **Foster collaboration for innovation**: facilitate collaborations and alliances between private companies, research institutions and government agencies. Encourage open innovation approaches, where organizations can share resources, knowledge and expertise to drive the collective exploitation of business opportunities.

- **Incentivize digital entrepreneurship**: development agencies should support digital entrepreneurs through initiatives such as startup competitions, seed funding and business mentoring programs. Provide access to financial resources and mentoring to help startups scale and grow.

- **Public Innovation**: Governments and Innovation Agencies should experiment with the processes of introducing new ideas, approaches or practices in the public sector to address societal challenges, improve public services and create positive impacts related to the digital economy. This involves finding novel solutions to complex problems, often leveraging technology, data and collaboration between government agencies, private organizations and citizens. Public innovation aims to improve the effectiveness, efficiency and responsiveness of government, ultimately benefiting the well-being of citizens and society at large.

- **Infrastructure development**: Digital ecosystems require robust and reliable infrastructure, including high-speed Internet connectivity and advanced data centers. Governments should invest in building and upgrading digital infrastructure to ensure that businesses and consumers have access to the technologies and services they need to thrive in the digital age.

- **Skills development**: Governments and innovation agencies can also play a role in promoting skills development and training programs in digital technologies. By investing in education and training, they can ensure that the workforce is equipped with the skills needed to participate effectively in the digital economy.

- **Facilitate collaboration**: multi-stakeholder collaboration is essential for the success of a digital ecosystem. Governments and innovation agencies can act as facilitators, bringing together

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industry players, research institutions, startups and other stakeholders to collaborate on innovative projects and initiatives.

- **Data protection and privacy**: As data-driven technologies become more prevalent, ensuring data protection and privacy is a critical concern. Governments can establish standards and regulations to protect the privacy of individuals and businesses and ensure that data is used responsibly and ethically within the digital ecosystem.

- **Promote inclusion**: Governments and innovation agencies must work to ensure that the benefits of the digital ecosystem are accessible to all segments of society. This includes promoting digital literacy, bridging the digital divide, and fostering gender diversity and inclusion within the digital economy.

- **International collaboration**: Governments and innovation agencies should encourage international collaboration to expand the reach of the digital ecosystem. This should be done through participation in global initiatives that enhance collaboration with other countries and enable partnerships with foreign entities to share knowledge, experience and market access.

Gender perspective and creation of an enabling environment:

- **Gender perspective**: foster gender diversity within the digital ecosystem by supporting initiatives that promote women's participation in technology and entrepreneurship. Provide specific support and resources for startups and women-led businesses to foster gender equality in the digital economy.

- **Inclusive policies and citizen protection**: ensure that policies and regulations related to digital ecosystems consider gender-sensitive approaches and protect citizens' rights. Address issues such as online harassment, cyberbullying and data privacy to create a safe and inclusive space for all users.

- **Establish innovation centers and incubators**: Governments and innovation agencies should create innovation centers and incubators that provide an enabling environment for start-ups, entrepreneurs and researchers to develop and test new ideas and technologies. These spaces can also offer mentoring, networking opportunities and access to funding.

- **Skills development and education**: Government initiatives focus on creating a skilled workforce to meet the demands of the digital economy. They invest in digital education programs, training initiatives and digital literacy campaigns to equip citizens and businesses with the skills needed to participate in and benefit from the digital ecosystem.

- **Citizen data protection:** Establish robust data protection measures to safeguard citizens' personal information within the digital ecosystem. Emphasize transparency and consent when collecting and using data, and ensure that data is securely managed to prevent potential breaches and misuse.

- **Political jurisprudence**: governments must generate the necessary legal framework to protect the rights of creators and innovators within the digital ecosystem, provide the necessary cybersecurity to safeguard the digital ecosystem from external threats, and regulate the digital ecosystem to prevent monopolistic practices and avoid unfair competition.

- **Ecosystem governance and coordination**: government and innovation agencies should act as coordinators and facilitators within the digital ecosystem. To this end, they should bring

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stakeholders together, set industry standards and facilitate collaboration between different actors. All this to ensure that the ecosystem functions cohesively and efficiently to achieve its objectives.

- **Government innovation labs**: Governments in the region could explore the creation of innovation labs within government organizations to experiment with new ideas, methodologies and digital technologies. These labs would provide an enabling environment for experimentation with innovative solutions before implementing them on a larger scale.

In summary, the members of roundtable 4 agreed that the accelerated technological change driven by digital transformation technologies is producing a paradigm shift in society. In this regard, they pointed out that:

1. One of the main roles of government in the face of such a situation is to effectively organize and regulate digital ecosystems to promote innovation, ensure digital inclusion, and address emerging challenges such as data privacy, cybersecurity and ethical considerations.

2. One of the key strategies is the early and full inclusion of the private sector within an environment that brings benefits to all levels of society, including the gender perspective and socially excluded groups.

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4.5 Working Table 5: Connectivity and Data Strategic Axis

Connectivity and data as fundamental pillars of digital ecosystems play a relevant role in driving innovation, economic growth and social progress. The dialogic workshop held at table 5 on the roles of connectivity and data in promoting and strengthening the RedCLARA digital ecosystem provided the necessary space for stakeholders to explore the opportunities and challenges associated with these key elements. Table 9 includes the names of the experts who participated in the workshop and presents the question that guided the dialogue and reflection process.

Table 9: Workshop participants and the question under reflection
Participants:
1. **Mario Martín (Telxius)** 2. **Ian Johnston (Liberty)** 3. **Iñigo García del Cerro (Ufinet)** 4. **Annalisa Bonatti (TISparkle)** 5. **Vincent Lemaire (Nokia)** 6. **Eduardo Grizendi (RNP- Brazil)** 7. **Juan Crosta (Specialist affiliated to RedCLARA)** 8. **Ana Ibáñez (DG CONNECT EC)** 9. **Marco Teixeira (RedCLARA)** 10. Mario Martín (Telxius)
The question:
How can RedCLARA harness the power of connectivity and data to drive innovation, empower individuals and communities, and create a sustainable and inclusive digital future within digital ecosystems?

According to the members of roundtable 5, connectivity and data are closely intertwined in a digital ecosystem, enabling seamless interactions, personalized experiences, data-driven insights and collaborative innovation. As such, the power of connectivity and data should be harnessed to facilitate the exchange of information, technologies and knowledge. This in order to contribute to the creation, within the RedCLARA Digital Ecosystem, of a virtuous circle of continuous improvement, adaptability and value creation for all stakeholders involved. Effective connectivity and data management, in other words, is crucial to ensure the success of the BELLA II project. Table 10 presents both the results generated by Working Table 5 and the contributions made by the experts who were interviewed in a semi-structured manner in the preparatory phase of the workshop held in Brussels at the EU-LAC Summit.

Table 10: Connectivity and data strategic axis from the perspective of the RedCLARA digital ecosystem

Connectivity:

From a pragmatic perspective, the members of roundtable 5 considered that connectivity should contribute significantly to solving the challenges associated with social and economic development in the digital era. In this sense, the five main recommendations generated by the working group established that harnessing the power of connectivity, as one of the relevant results of the BELLA II project, should lead to:

- **Enable the exchange of data, information and knowledge in real time**: This would be achieved through the construction of interconnected repositories that facilitate access to users and devices that support decision-making on programs and projects that can be undertaken.

- **Mapping of programs and projects**: facilitate collaboration between different stakeholders, such as content creators, connectivity service providers, and consumers of digital services, in order to produce an updated map of programs and projects and a portfolio of enterprising projects.

- **Development of methodologies for the execution of social impact projects**: conceive, implement and validate methodologies that allow the application of connectivity with meaning to the formulation, negotiation and execution of high impact social projects for the region.

- **Monitoring and evaluation**: develop bi-monthly executable practices for the follow-up, at regional and international level, of the activities related to the fulfillment of the general objective and specific objectives of the BELLA II project.

- **Identification and provision of services: to** conceive and develop technology- and knowledge-intensive digital services applicable to the generation of solutions required to meet the general objective and specific objectives of the BELLA II project.

Data:

The workshop proposed that the BELA II project should contribute to the generation of a data space, understood as part of the environment created by the RedCLARA Digital Ecosystem in order to support the complex and dynamic process of exchange between stakeholders through which knowledge is managed, value is co-produced and digital innovations are co-created in services, products and processes.

In the context of the BELLA II project, the data space will encompass a wide range of data sources, including structured and unstructured data, generated from a variety of devices, systems and processes. The functions to be provided by this data space included:

- **Personalization**: which is key for a Digital Ecosystem such as RedCLARA's, characterized by being data-driven, focused on human beings and the generation of answers to their needs within the framework of the digital economy.

- **Analytics and reporting**: related to the ability of data to generate valuable information on user behaviors, market trends and performance metrics, which can inform decision making and strategies associated with meeting BELLA II project objectives.

- **Improve services and products**: associated with the need for a dynamic data space, capable of producing the information and knowledge required to respond to the region's changing digital needs.

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- **Predictive capabilities**: linked to the use of the data space for the design and implementation of models that, from a systemic and ecological perspective, facilitate strategic thinking and action that contribute to the achievement of the objectives of the BELLA II project.

- **Data security and privacy**: associated with the implementation of robust data security measures to protect sensitive information from unauthorized access or breaches. This is to comply with data privacy regulations and obtain the necessary user consent for data collection and use.

The data space being conceived by RedCLARA will foster collaboration and innovation, allowing stakeholders to work together on projects related to both the generation of data and the development of a platform for sharing knowledge, experience and resources on topics and areas of knowledge of common interest. In this sense, the key processes associated with the design and consolidation of the data space to be built by RedCLARA should be based on:

- **The identification of data needs**: which involves determining what types of data are needed to achieve the ecosystem objectives and support the services and applications to be offered by the BELLA II project.

- **The design and implementation of data collection methods**: this includes deciding on the appropriate data collection methods based on the type of data needed. This may include sensors, IoT devices, user input, web scraping, APIs and integration of data from external sources.

- **Data quality and integrity**: This involves ensuring data quality and integrity throughout the data use life cycle. This should include the implementation of data validation processes, error handling and data cleansing techniques to avoid inaccuracies and inconsistencies.

- **Data storage and management**: Which involves the establishment of a scalable and reliable data storage infrastructure to handle the volume, velocity and variety of data generated within RedCLARA's Digital Ecosystem.

- **Data governance**: which involves defining and implementing data governance policies and procedures (ownership, access controls and data exchange protocols) to ensure that data is used responsibly, ethically and in line with the objectives pursued by the BELLA II project.

Governments, multilateral organizations, Innovation Agencies, RedCLARA, connectivity service providers, NRENs, are convinced that the capabilities to govern, manage and create value from large data streams from different sources and in many forms (structured/stored, semi-structured/tagged and unstructured/moving) represent a new form of competitive differentiation. As such, RedCLARA intends and is committed to the process of harnessing the power of connectivity and data to drive innovation, empower people and communities, and create a sustainable and inclusive digital future for LAC. The success of this initiative will depend on the capacity we develop to; (i) integrate and analyze information (through digital transformation technologies), (ii) develop support systems (such as big data control towers) and (iii) support decision making through data analytics processes.

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5. Implications of the contributions made by the working groups from the perspective of the BELLA II project being implemented by RedCLARA

The members of the working groups examined the evolving landscape of digital ecosystems in LAC, particularly in the context of a strategic relationship with the European Union, whose flagship is the EU-LAC Digital Alliance signed in Colombia in March of this year. Contributions from stakeholders allow us to affirm that collaboration between the two regions has immense potential to shape the future of digital economies and societies. At present, we can identify the following achievements and opportunities offered by the bi-regional Alliance.

- **Strengthening connectivity and infrastructure:** The infrastructure supporting the digital ecosystem in LAC has seen significant advances in recent years, driven by efforts to improve connectivity and digital infrastructure. The BELLA I project concluded in 2021 is an example of how the partnership with the EU offers a unique opportunity to leverage its expertise and resources to bridge digital divides, promote high-speed Internet access, and strengthen the technological base needed for resilient digital ecosystems.

- **Foster innovation and entrepreneurship:** the growth of digital ecosystems depends on fostering innovation and supporting entrepreneurial efforts. LAC nations, based on regional foresight exercises, could design and implement collaborative projects with the EU that enable knowledge sharing, capacity building and funding opportunities that foster a growing culture of innovation. Joint initiatives can facilitate technology transfer, research partnerships and startup incubation programs to drive the development of the digital and knowledge economy.

- **Address regulatory harmonization:** the development of a harmonized regulatory framework is crucial for the success of digital ecosystems. The partnership between LAC and the EU provides an avenue for sharing best practices, policy ideas and regulatory approaches. Collaborative efforts can help address challenges related to data protection, cybersecurity and cross-border data flows, creating an enabling environment for sustainable growth.

- **Promote digital inclusion:** In the quest for thriving digital ecosystems, it is imperative to ensure that the benefits of digital transformation are inclusive and reach all segments of society. Partnership with the EU can facilitate capacity building programs, digital literacy initiatives and skills development to empower people, especially those from underserved communities, to actively participate in the digital economy.

Over the next three years, the opportunities created by the four pillars of the EU-LAC Digital Alliance will give rise to various projects capable of contributing to the digital development of the region. In this sense, the synergies between the strengths of both regions will allow harnessing the potential of the cyber-physical revolution, driving innovation, inclusion, empowerment of stakeholders and sustainability. To the extent that bi-regional international cooperation and collaboration is consolidated, the possibilities of

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generating a powerful digital economy that not only raises economic indicators, but also positively transforms the quality of life and well-being of our societies, will increase.

The contributions made by the members of the working groups pave the way towards programs and projects that could be implemented in the next three years. From RedCLARA's perspective, many of the initiatives to be implemented will take place within the framework of the BELLA II project. From the implications derived from the contributions made by the experts, it is evident that RedCLARA should contribute— given its relationship with academia, R&D+i organizations, connectivity service providers, and its experience with data spaces— to the consolidation of the infrastructure for connectivity, and the development of the vast potential immersed within a digital ecosystem driven by data, centered on human beings and oriented towards meaningful and purposeful connectivity.

RedCLARA's contribution to the connectivity pillar will be structured within the scope of its mission, which is **"To contribute to the development of science, education, technology and innovation in Latin America and the Caribbean through the articulation, connection and strengthening of its national research and education networks"**. In the exercise of this mission and taken as a whole, the infrastructure of the Clara Network, the digital competencies it possesses, and the regional and international relations it has built, allow affirming that it has, at present, the set of resources and competencies and capacities summarized in Table 3.

Table 3: RedCLARA's resources, capabilities and competencies
1. An infrastructure for its own powerful connectivity, integrated by the NRENs and placed at the service of the search for solutions to the challenges of the digital economy.
2. The capacity to establish alliances with other advanced networks at the international level with the intention of promoting **Intelligent Knowledge Networks**.
3. Experience in the design and implementation of methodologies for interaction between large groups for the exploration and search for solutions to complex problems related to the digital economy.
4. The availability of the necessary infrastructure for development and experimentation with test beds for the validation of digital innovations prior to their scalability.
5. Access to large computational capabilities applicable to both data processing and modeling of distributed interactions between stakeholders in highly complex environments.

So far, the dimension of RedCLARA's mission related to the creation of conditions that allow us to contribute with greater efficiency, effectiveness and impact to the management of public and private innovation processes has not progressed satisfactorily. The EU-LAC Digital Alliance will allow us to change this situation. Indeed, the synergy between the four pillars of this alliance can serve as a launching pad for a thriving digital entrepreneurship ecosystem. That is, to the creation of supportive environments for startups and SMEs, offering access to mentoring, financing and enabling markets for the emergence of a new generation of digital pioneers. In the next three years, RedCLARA will contribute to these efforts from

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two dimensions: academic and socio-technical. The first associated with the process of innovations in education for the training of human talent. The second related to the principles of the manifesto of Industry 5.0 produced by the European Commission with the intention of promoting a socio-economic development that places the human being at the center of this process.

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6. Possible scenarios for action

Based on the contributions made during the workshop, the semi-structured interviews, and the research on secondary sources of information, we have carried out a scenario building exercise. The main motivation behind the use of scenarios is the identification of probable futures, so that they can contribute to anticipation, or to the generation of contingency plans for unforeseen events. It is not about predicting the future, but to be better prepared to make informed decisions and develop strategies that allow to undertake, from the RedCLARA digital ecosystem, strategies and solutions of greater impact on the socio-economic development of LAC.

This scenario-building exercise was carried out following the methodology developed by the Stanford University Research Institute. To this end, participants were consulted on the fundamental components that help us explore and understand possible future options: **trends** and **uncertainties**. In this context, trends are patterns, situations or developments that have been observed over time whose value lies in the fact that they suggest the direction in which we will move, in this case, the knowledge society and the digital economy.

Uncertainties, on the other hand, refer to factors that are difficult to predict or control, leading to different possible futures. They introduce variability and complexity into the scenario building process. Such uncertainties can arise from a variety of sources. For example, technological changes, political instability, demographic changes, social inclusiveness, business culture, economic conditions or government decisions.

In developing scenarios within which the RedCLARA digital ecosystem might perform, trends and uncertainties were combined to create plausible future narratives based on consideration of both predictable patterns and uncertain factors. By combining these trends and uncertainties, scenario development allows exploring, within a given performance environment, how the actions of stakeholders enhance or inhibit the optimal functioning and growth of the RedCLARA digital ecosystem. Based on this information, decision makers can identify critical drivers and potential risks that may affect the development of the digital ecosystem. This knowledge will contribute to strategic planning, risk management, and the identification of programs and projects that generate the enabling conditions for the evolution of the RedCLARA ED into an increasingly innovative, adaptive and resilient ecosystem.

The contributions in ideas, thoughts and experiences by the stakeholders that have been consulted so far allowed us to identify—in economic, technological, social, educational, political and cultural aspects—a wide range of trends and uncertainties applicable to the construction of possible scenarios for action. In Table 11 we list the trends and uncertainties of greatest relevance from the perspective of the consolidation of RedCLARA as a digital ecosystem driven by data, focused on human beings and enabled by digital transformation technologies.

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Identified trends and uncertainties

Trends:

- **Investment in digital infrastructure:** Governments around the world are increasingly investing in building and upgrading digital infrastructure, such as high-speed Internet connectivity, data centers and cloud computing facilities, to support the growth of digital ecosystems.

- **Public-private partnerships:** governments are increasingly collaborating with private companies and startups to co-create and implement digital ecosystem projects and initiatives, leveraging the expertise of both sectors.

- **Increased adoption of AI and machine learning**: AI and machine learning technologies are becoming more prevalent and are being integrated into various digital ecosystems to improve decision making and user experiences.

- **Digital skills development:** governments are focusing on initiatives to improve digital literacy and skills among the population to ensure that the workforce can fully participate in and benefit from digital ecosystems.

- **Personalization and user-centric experiences:** digital ecosystems are moving towards providing personalized and user-centric experiences, tailoring services and content based on individual preferences and needs.

- **Data privacy and security concerns**: as data-driven ecosystems rely heavily on user data, there are growing concerns about data privacy and security, leading to increased regulations and demand for transparent data handling practices.

- **IoT and smart device integration**: The Internet of Things (IoT) and smart devices are being integrated into digital ecosystems, enabling seamless connectivity and data exchange between devices and platforms.

- **Emphasis on sustainability and responsible innovation**: There is a growing focus on sustainability and responsible innovation in digital ecosystems, with stakeholders seeking environmentally friendly and socially responsible practices.

Uncertainties:

- **Government support and funding**: the level of financial support and long-term commitment from governments to foster digital ecosystems can vary, affecting the scale and sustainability of digital initiatives.

- **Emerging technologies**: the rapid development of emerging technologies, such as artificial intelligence and blockchain, introduces uncertainties about how governments will regulate and integrate these technologies within digital ecosystems.

- **Regulatory clarity**: uncertainty regarding future policy changes and regulatory requirements can create challenges for companies and investors seeking to participate in digital ecosystems.

- **International collaboration**: the extent to which governments cooperate internationally on issues such as cross-border data flow and global digital standards will significantly influence the development of digital ecosystems.

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- **Public trust and privacy concerns**: maintaining public trust and addressing privacy concerns regarding data collection and use within digital ecosystems can shape government policies and public perception.

- **Emerging technologies**: the rapid development of emerging technologies, such as Artificial Intelligence and blockchain, introduces uncertainties about how governments will regulate and integrate these technologies within digital ecosystems.

- **Digital divide and inequality:** despite efforts to promote digital inclusion, uncertainties persist around addressing the digital divide, ensuring equal access to digital technologies and preventing further exacerbation of social inequalities**.**

The questions associated with the generation of the scenarios were: Which are the stakeholders with the greatest capacity to influence the process of growth and consolidation of digital ecosystems? What would be the impact of the behaviors assumed by these stakeholders in the face of the uncertainties raised? Of the three stakeholders with the greatest power of influence (government, business and academia) we have chosen to select government and business as those with the greatest power of influence in relation to the creation of the necessary conditions for the fulfillment of the objectives of the BELLA II project. The key attitude assumed by each of these agents could be summarized as follows:

1. The integration will of the governments of the countries of the region to face, under a shared vision and in a collaborative manner, the intervention process aimed at enhancing the application of digital transformation technologies to the economic development of our societies.

2. The commitment of companies and their decisive leadership to the management of the necessary processes so that the challenges of digital transformation become an opportunity to make them more sustainable, socially responsible, productive and competitive, both regionally and internationally.

Taking these two uncertainties as starting points, we have generated four scenarios: **every man for himself**, **slow awakening**, **ideal gearing** and **constructive dialogues**. The x-axis of the figure corresponds to the uncertainty associated with the role of the government, while the y-axis represents the attitude of the private sector.

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Figure 1: The four scenarios conceived as a function of the proactive or reactive behavior of the government or the private sector. In this context, proactivity is an indicator of the intention of each of these agents to undertake the necessary actions to foster the creation of digital ecosystems that promote socioeconomic development, while reactivity refers to the inability to act in this direction.

Table 12 presents a brief description of the main characteristics related to each of the proposed scenarios. Taken together, these scenarios are representative of the situations that may be encountered in the various South and Central American countries participating in the implementation of the BELLA II project by RedCLARA.

Table 12: Scenarios related to the Digital Transformation Process	
Constructive dialogues: Reactive government/ proactive companies	**The Perfect Gear: Proactive government and business**
In this scenario, public funding for the development of the digital ecosystem is limited, but there is a strategic vision on the part of the private sector regarding the processes of co-production of value and co-creation of innovations to overcome the digital divide and promote social, economic and technological development. Entrepreneurs, aware of the need for an enabling environment to encourage competitiveness, productivity and innovative capacity of companies, promote strategic dialogues with the public sector capable of contributing to the gradual incorporation by the latter of the regulatory framework, instruments and financing mechanisms to enhance digital ecosystems.	In this scenario, the government and the private sector work closely together to create a human-centered digital ecosystem. The government provides substantial funding and support for innovation initiatives, business incubation, and research and development projects. The private sector actively participates in joint ventures, sharing resources and knowledge with other stakeholders. This collaboration leads to the emergence of cutting-edge digital solutions that effectively address societal challenges. The ecosystem thrives due to a strong focus on inclusion and long-term sustainability, fostering an environment where technology benefits everyone.
Every man for himself: Government and reactive companies	**Slow Awakening: Proactive Government/Reactive Companies**
In this scenario, limited government funding and the limited innovative capacity of the private sector result in a very weak digital ecosystem. Such conditions prevent the conception of a shared public-private strategic vision that would contribute to significant improvements in both the technological and knowledge infrastructures, as well as in the environment needed to drive the processes capable of producing the social, scientific, technological and economic changes that the country or the region demands in the medium and long term. This scenario leads to exclusivity, critical poverty and social instability in the long term.	In this scenario, there is ample funding available for the development of the digital ecosystem, but the strategic vision of the government and the private sector diverge. The private sector pursues innovation projects independently, focusing on for-profit solutions without a strong commitment to social responsibility. The government, on the other hand, may prioritize certain industries or technologies over others. As a result, the ecosystem becomes fragmented, with limited collaboration and disjointed efforts. While some progress is made, there is a lack of synergy, hindering the ecosystem's potential to have a greater impact on its environment..

The "Perfect Gearing" scenario represents a situation far removed from the current reality of the countries in the region. The main value of this scenario is that it summarizes the characteristics of the desired state, the bet scenario towards which we should approach in the medium term. The other three scenarios are closer to the conditions that, with nuances, we can observe in the countries of the region depending on the maturity and strengths of their national or regional innovation systems or ecosystems. In a country like Brazil, for example, where state-led intervention strategies for more than 20 years resemble those of the other OECD countries, we can find characteristics of the ideal scenario. On the contrary, those countries whose levels of investment in **science, technology and innovation (STI)** are almost non-existent

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and in which State-University-Business relations leave much to be desired, we would be closer to the every man for himself.

The opinions gathered during the semi-structured interviews coincided in pointing to low levels of investment in STI, political instability and the discontinuity of national or regional innovation strategies aimed at strengthening and energizing national innovation ecosystems as the main barriers limiting the incorporation of LAC countries into the digital economy and the knowledge society.

The EU-LAC Digital Alliance provides a favorable framework to deepen the reflection process necessary to explore and develop— based on the lessons learned from four decades of European experimentation with the cycles of design, launch, evaluation and redesign of public policies— scenarios for action to accelerate the design and implementation of solutions arising from the application of digital transformation technologies to the socio-economic development of the region.

The work with the scenarios generated will contribute significantly to the structuring and continuity of the open strategic dialogues that are being carried out in the framework of the implementation of the BELLA II project. Specifically, in the creation of a communicational space in which stakeholders, from their respective spheres of influence, commit to the creation of enabling conditions for the regulatory framework, strategies for access to funding sources and empowerment of organizations, institutions, individuals and communities that will make possible the desired social and economic transformations.

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7. Final approaches and recommendations related to coordination and linkage with other pillars of the alliance and with the European Commission

The **EU-LAC Digital Alliance** represents an unprecedented opportunity to foster cross-continental collaborations. By aligning digital strategies, sharing experiences and co-creating innovative solutions, the two regions can create a robust ecosystem that transcends geographic boundaries. Joint projects can span areas such as e-government, e-commerce, digital education and smart city development.

In this sense, the alliance could promote a new vision of existing bi-regional agreements, amplifying their impact and fostering the evolution towards new dimensions of cooperation and collaboration for the co-production of value and the co-creation of innovations in areas of common interest. It is a vision focused on harnessing the power of digital transformation technologies to reinforce various sectors and strengthen the basis of bi-regional relations. For example, in the use of such technologies to address environmental challenges, improve agricultural practices and promote green solutions to contribute, from the partnership, to the achievement of the Sustainable Development Goals of the United Nations.

At the close of the **III European Union-Community of Latin American and Caribbean States (EU-CELAC) Summit**, a working session was held to reflect on the future roadmap for the continuity of both the BELLA II project and the efforts needed to strengthen and expand RedCLARA's digital ecosystem. The main conclusions of the reflection process were the following:

1. **The synergy between the four pillars of the EU-LAC Digital Alliance**: The four pillars are part of a system whose strategic axes— connectivity, investment acceleration, policy dialogues and the Copernicus program— must be closely related, which requires great coordination between the organizations that drive these pillars.

2. **Leverage in the EU Regional Delegations in LAC**: The process of negotiating the portfolio of programs and projects to be implemented over the next three years in the different countries must be supported by the delegations in the design, implementation, and evaluation phases.

As a final reflection, it should be considered that, in the coming years, third generation public policies at the European level will be oriented towards intervention methodologies for the strengthening and dynamization of digital innovation, business and knowledge ecosystems according to approaches in which the social and not the technological dimension is what determines the scopes, coverage and impact of the desired socio-economic transformations. This reinforces the relevance of the design and implementation of digital ecosystems that are data-driven, human-centered and supported by digital transformation technologies.

Joint action and coordination between the pillars of the EU-LAC Digital Alliance will pave the way for: (i) the formulation, negotiation and implementation of programs and projects capable of contributing to economic growth and social development; (ii) ensuring the continuity of the open strategic dialogues necessary to foster relationships to exploit the potential of digital technologies generating strategic

science, technology and education for both regions; and (iii) systemic and systematic work in areas such as digital transformation, artificial intelligence and cybersecurity enablers for the joint creation of innovative solutions that address common challenges and shared intercontinental interests.

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Anexx 1

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11	Eduardo Grizendi	Red Nacional de Enseñanza e Investigación. RNP- Brasil	Director de Ingeniería y Operaciones
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20	Iñigo García del Cerro	Ufinet	Director ejecutivo
21	Irene Arias	BID Lab	CEO
22	Jean-Marie Chenou	Expertise France	Experto en ciberseguridad
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