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The Creation of Innovation Through Public-private Collaboration

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ABSTRACT

This article develops the notion of how different options of public-private collaborations implemented by organizations affect the creation of innovation through a case study: the Blood and Tissue Bank. Data were obtained through in-depth semi-structured interviews with the entire managerial team of the organization under analysis. We coded the interviews, and implemented content analysis. These data were triangulated with the analysis of the organization's internal documents. This article contributes to the understanding of innovation management in public-private collaborations in health professions by identifying the existence of different options in an organization to develop collaborative innovation among the public and the private sectors: contracts, contractual public-private partnership, and institutionalised public-private partnership. We observed that the creation of innovation is directly related to the institutional arrangement chosen to develop each project. Thus, certain innovations are unfeasible without a high degree of maturity in the interorganizational collaboration. However, it is also noteworthy that as the intensity of the collaboration increases, so do costs, and control over the process decreases.

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La generación de innovación a través de la colaboración público-privada

RESUMEN

En este artículo se desarrolla la idea de cómo las distintas opciones colaborativas público-privadas implementadas por las organizaciones afectan a la generación de innovación a través de un estudio de caso: el del Banco de Sangre y Tejidos. Los datos se obtuvieron mediante entrevistas en profundidad y semiestructuradas a todo el equipo directivo de la organización analizada. Se codificaron las entrevistas y se realizó un análisis de contenidos. Esta información se trianguló con la revisión de documentos internos de la organización. Este artículo contribuye a generar conocimiento sobre la gestión de la innovación en colaboraciones público-privadas en salud identificando la existencia de distintas opciones en una organización para desarrollar innovación colaborativa entre los sectores público y privado: contratación, partenariados público-privados contractuales y partenariados institucionalizados. Se constata que la generación de innovación está directamente relacionada con el acuerdo institucional escogido para desarrollar cada proyecto, de modo que determinadas innovaciones no son posibles sin un grado elevado de madurez en la colaboración interorganizativa. Sin embargo, también cabe destacar que, a medida que la intensidad de la colaboración se incrementa, los costes también, y el control del proceso disminuye.

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Abbreviations

BST: Blood and Tissue Bank (*Banco de Sangre y Tejidos*)

PPP: public-private partnership

INTRODUCTION

Innovation has been heralded as an imperative component of public organizations.¹ However, the definition of innovation is still under debate, even through the academic literature on public administration is full of arguments highlighting the importance of innovation to continue to develop health, education, and safety services successfully. In contrast to the classically held view, which identifies innovation as a new product, we have adopted the results from recent studies that also integrate the possibility of considering management practices as sources of innovation.

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Such is the case expounded by Mandell et al.,² who defended the idea that collaboration between 2 organizations is an example of innovation as it produces a product or service through a new medium: interorganizational relationships. The consequence of this hypothesis was the emergence of new possibilities for organizations when deciding how to manage innovation: whether to develop in-house innovation or collaborate with outside parties.

This article focuses on organizational theory of the concept of innovation, but also attempts to improve this argument, since the novel concept set forth by Mandell et al. has been heavily overshadowed by real-world experience during the last decade. Organizations in the public sector have implemented several interorganizational relationships in recent years,³ such that we have established that interorganizational collaborations should no longer be considered as innovations *per se*, given the level of maturity of the knowledge generated regarding the key factors for success and expansion in public organizations. Collaborations between organizations should not be considered innovation, but rather an important catalyst for possible innovations that in-house development alone would make impossible or more difficult to achieve.

In this article, we analyze how decisions in the public sector on the structure of public-private collaborations affect innovation. We established 2 research questions: how can the management of innovation in the public sector be improved? and what is the impact of organizational infrastructure in generating innovation?

We have structured the article into the following sections. The first section analyzes the definitions of the term innovation in public management literature. We also describe the primary types of institutional agreements recognized by the European Commission. We also present the case of the Blood and Tissue Bank (*Banco de Sangre y Tejidos*, BST), a public organization that represents a clear example of how innovation can be achieved in the field of health care. We then describe the methodology used for data collection in order to understand how the different interorganizational agreements adopted by an institution affect the innovation produced. Subsequently, we present the results of the study. Finally, we provide the most important conclusions from this case.

INNOVATION: MULTIPLE DEFINITIONS

Damanpour et al.⁴ pointed out the difficulty of narrowing down the meaning of the term innovation, affirming that “innovation is a complex construct studied from several different perspectives, at different levels of analysis, by researchers from distinct academic disciplines.” As such, before delving into how institutional agreements can facilitate innovation, it is essential to clarify how innovation is defined in this article.

The classically held vision of innovation focuses on the development of new products and services.⁵ However, the concept of innovation has recently been extended. Young et al.⁶ proposed a framework for innovation based on the adoption of new practices in the management of an organization. According to these authors, innovation is also the adoption of a concept or practice not previously in use by the organization. Thus, innovations arise from within organizations, and may not always be perceived by users.

Moore et al.⁷ took this line of reasoning even further by proposing a new concept: innovation in governance. According to these authors, the main characteristics of innovation in organizational governance are centered first and foremost on the fact that innovations are conceived of and implemented by more than a single organization. As such, the framework is expanded to include organizational networks and the transformation of complex social systems of production. Secondly, these innovations are not solely

the result of specific changes in output, but also of changes in other areas, such as the resources utilized (for example, the forms of financing used), the processes used to decide what should be produced, or even indicators for evaluating productivity and the feasibility of the product or service. The perspective taken by Moore et al. expands the commonly held concept of “innovation,” and the most important contribution of these authors is that innovation cannot solely be viewed within organizations, but must be seen within the sum of relationships established with other organizations to develop the products or services provided.

In a similar train of thought, Mandell et al.² developed the concept of interorganizational innovation. These authors consider the institutional agreements that public organizations use to provide public services as examples of organizational innovation. From among the different organizational forms found in the public sector, Mandell et al. focused on public-private partnerships (PPP), arguing that the development of these partnerships is an innovation over other more traditional structural models (market-driven or hierarchical models).⁸ What do we mean by partnership? One definition of a PPP that is widely accepted by several authors is that proposed by Klijn et al.,⁹ who defined it as “cooperation between public and private partners, of a lasting nature, in which the partners work together to develop products and/or services, and where the risks, costs, and benefits are shared.” This definition is inclusive and also narrows down the spectrum of PPP, distinguishing this type of partnership from other traditional forms of collaboration.

In contrast to the traditional business contract, a PPP demands a high level of intensity not generated by all such relationships between a business and the public sector. Two key variables set these partnerships apart¹⁰: the projects developed must be long-lasting and mid-/long-term, and the members of the partnership must work together to develop the products and services while sharing the costs, risks, and benefits. As such, the 2 characteristics distinguishing partnerships from other collaborative formulas are duration and transfer of risks.

As discussed in previous paragraphs, the concept of innovation has several different usages, and it is difficult to encompass them all within a single definition. However, to establish a unified concept for this study, we have adopted one of the definitions that best exemplifies the multiple aspects of the concept of innovation, that proposed by Walker¹¹: “innovation is a process through which new ideas, objects, or practices are created, developed, or reinvented, and which are new for the unit of adoption.” This definition develops the concept of innovation in its most general sense, taking into account not only material products, but also new organizational practices or simply even new ideas. It is also worth pointing out that Walker’s definition specifies that the unit that adopts an innovation is that which establishes the creation of the innovation. In other words, to innovate does not mean to do something that has never been done in any organization, but rather to do something that has never been done within the organization being examined.

To clarify the distinct perspectives that constitute the concept of innovation, Figure 1 summarizes the primary characteristics that define an innovation. As shown in Figure 1, innovations can take the form of production of new goods or services or organizational management. Thus, innovation can be a new product or service, a new structure, a new organizational practice, or the use of some new type of resource. In each of these cases, the organization pursues a specific benefit. For example, in the case of developing new patents, the organization attempts to obtain financial benefits and increased prestige, whereas innovations in organizational management aim to optimize resources, both financial and otherwise.

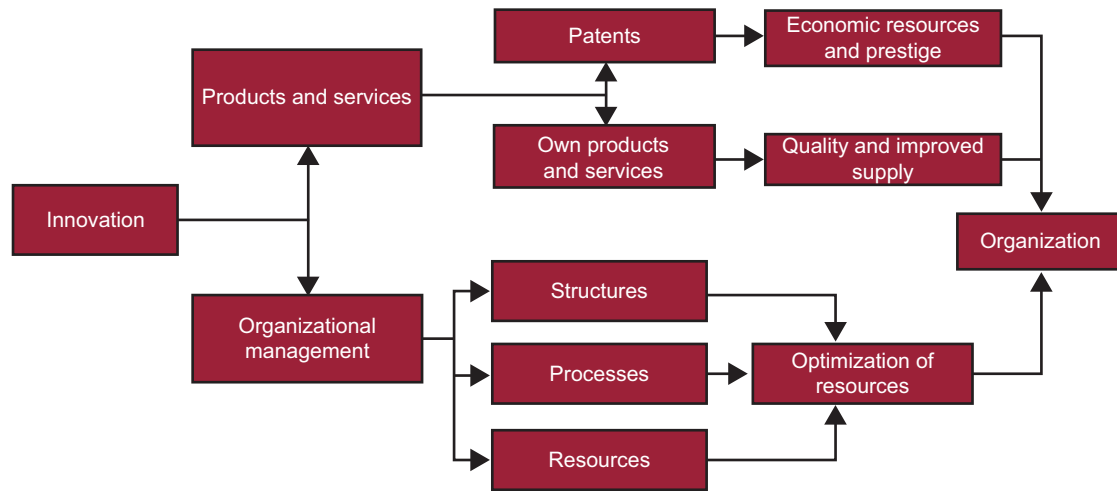


Figure 1. Types of innovation in public organizations.

TYPES OF INTERORGANIZATIONAL RELATIONSHIPS: INSTITUTIONAL AGREEMENTS

The available literature on the subject tells us that there are 2 different classical forms in which organizations can operate: working within the local resource network (in-house) or through market interactions (contracting-out).¹² In the first case, organizations produce whatever they need without requiring interactions with other organizations. In the second case, the organization decides to collaborate with another, for example, by purchasing a product or service available on the market. Starting from these 2 systems, the current complexity of the world of organizations has allowed the emergence of new organizational forms, which is the case of public-private alliances, or PPP.¹³

Within the spectrum of this third category, alliances between organizations can vary widely. In this article, the European Commission reports defining the types of PPP are taken as the reference. Specifically, the European Commission distinguishes 2 major types of PPP: contractual and institutionalized.¹⁴

In the case of contractual PPP, the relationship between partnering organizations in the alliance is primarily based on a hierarchical contract in which the public organization plays the leading role in the project, determines which results should be obtained, how to manage the project, how to finance the project, and what evaluation indicators to monitor. To this end, the public institution seeks the best possible partner by analyzing market competition and transparency. This type of collaboration is similar to that of making a purchase, with the difference that in this case, the product is “custom-made”, both parties share the risks, and the projects are developed on a long-term basis. The sectors that most frequently use contractual PPP are those involved in large-scale infrastructure (including health care) and communications.

The second type, institutionalized PPP, show a higher level of intensity in the collaboration, as all organizations seeking to join in

must create a new participatory organization. This new method of collaboration is the vehicle through which organizations combine their knowledge and multiply their efforts in order to achieve a common goal. It is thus of utmost importance that the decisions made regarding the corporate governance of a new organization respect and represent the interests of the founders. Since the classical roles of “buyer” and “seller” do not apply here, organizations must engage in cooperative production, in relationship based on equal status.

Table 1 shows the differences between the 2 types of PPP. The level of commitment of the partner organizations is greater in the case of institutionalized PPP. In the following sections, we will elaborate on the methodology used to test how these different organizational structures affect innovation.

METHODS

The evidence presented in this article was extracted from the case study of BST, a public organization that stood out in its sector for its ability to interact with other organizations with the objective of becoming an industry leader in the processing of blood, tissue, breast milk, and umbilical cord donations in Spain.

Case studies are commonly used in studies of public organizations.¹⁵ This type of study has been proposed as the optimal source of information for understanding how innovation is developed in public organizations,¹⁶ largely due to the advantages provided by qualitative methods for analyzing concepts that occur in specific contexts,¹⁷ such as in the case of health care organizations. The concept examined in this case study is innovation, and the context is the various interorganizational relationships that can exist between a public institution and the private enterprises it collaborates with.

Table 1 Comparison Between Contractual and Institutionalized Public-private Partnerships (Based on the European Commission Report¹⁴)

Contractual public-private partnerships	Institutionalized public-private partnerships
Based on hierarchical relationships (<i>Ley de Contratos del Sector Público</i> [public sector contract law])	Require the creation of a new organization (normally in the sphere of private law)
The public organization determines the objectives of the contract to be implemented by the contractor	More general objectives that the new organization must achieve
Hierarchical relationship between public and private organizations: buyer-seller relationship	Public and private parties work as equals: organizational structure is one of equality, a network
Example: concessions	Example: joint venture

One of the requirements for a case study is that it be relevant to the objectives of the research. Borins¹⁶ insists on taking special care in selecting a case for analysis, reminding us that the major issue in case studies is the possibility of extrapolating the results obtained to infer conclusions for the general population. However, Siggelkow¹⁸ mentions that the objective of a case study is not to generalize its results, but rather to facilitate the understanding of a specific phenomenon. This author argues that, in many cases, case studies are selected for being an appropriate example in which the phenomenon under examination can be observed.

With this in mind, we chose the case of BST for this study for 3 reasons (these criteria coincide with those used for previous case studies of public organizations¹⁹):

- Collaboration with other organizations and innovation are 2 of the major objectives of this institution, as reflected in its mission statement and business strategies.
- BST has an impressive record of innovation through the process of research, which has facilitated the production of patents while managing the provision of blood and tissues.
- BST is an example of a successful public enterprise. In the last decade, BST has experienced major growth, evolving from a small organization to one capable of including all blood and tissue banks currently functioning in Catalonia (both public and private), and currently has a monopoly on the process of blood donation in the region. In 2009, BST was awarded the entrepreneurial competitiveness prize by the Department of Innovation, Universities, and Business of the Government of Catalonia. In the following section, we will describe the characteristics of BST in detail.

Case Study: The Blood and Tissue Bank

BST is a public enterprise belonging to the Catalanian government. Created in 1995 to ensure the proper use and provision of blood and tissue, it has become a reference authority in immunological diagnosis and advanced therapies. In 2006, BST concluded the long process of unifying the 12 blood banks located in Catalonia. Since then, BST has been responsible for planning the coverage of existing needs at all Catalanian health centers, both public and private. To carry out its activity, BST manages a 73.8 million euro budget (2010) and a total of 640 employees. In terms of organizational structure, BST has the following corporate divisions: quality assurance, management control, and projects and innovation.

BST is geared toward fostering knowledge, with a strong emphasis on public service. It is an innovative organization, not only with regard to its main activities, but in all areas of management. One example is that the new headquarters was one of the 4 finalists for the Sustainable Europe Energy Awards 2011 in the category of "LIVING," from amongst a total of 309 projects presented for the European prize of the most sustainable building of the year. The annual BST report emphasizes the values of coherence, excellence, innovation and research, service to society, and transparency, among others. Similarly, the company's vision and mission statement are focused on innovation and optimizing the image of BST in the international community.

In terms of management, BST is a public enterprise, with a high level of autonomy, attached to the Health Department. This autonomy has allowed BST to adapt well in a dynamic business sector and has also allowed it to decide its own model of corporate management (decision-making bodies). This structure is highly professional, which, together with the combination of public and private sectors in its governance (the president of the company is a leading industry figure) and strong executive leadership, has

protected BST from possible political interference. This combination of strengths has been essential for providing the organizational stability that has allowed BST to achieve its objectives.

The organizational model of BST, which received the 2010 Excellence Award of the European Foundation for Quality Management, is based on 3 premises: sustainability (guaranteeing the availability and safety of transfusions, ensuring results and an end-user approach), professional management, and the support of research and development (R+D). The prize emphasizes 4 different pillars that reinforce the management of this organization: the legal framework (a public enterprise within the Health Department), integrated management of the blood donation process, commitment to scientific innovation and the creation of new products and services, and a dynamic atmosphere with dedicated professionals.

In promoting R+D activities, BST is committed to research as a strategy for providing high-quality services and incorporating improvements into the company's framework, at the same time as developing new therapeutic and diagnostic tools. The results of these efforts are the patents registered, as well as the start of spin-offs for the development of more new products, together with private, national, and international partners.

Data Collection

This research was carried out using some of the qualitative methods proposed by Marshall et al.²⁰ for data collection: in-depth interviews, document analysis, and triangulation of the information obtained.¹⁷ Data triangulation is generated by using several sources, theories, and studies.²⁰ Triangulation aids in generating explanatory factors for the different subjects under investigation,²¹ which reduces the probability of interpretations arising that may not be truly representative of the phenomenon under examination.²²

The data were collected through several visits to BST. During these visits, face-to-face, in-depth interviews were also held with the entire managerial team. The authors of this article personally administered the 14 interviews. Each interview included 10 primary questions related to collaboration and innovation. These questions were used as guidelines for the interview, but were adapted to each interviewee and redesigned for the sake of obtaining new information and the specific dynamics of each interview. The interviews lasted 60-90 min and were recorded for later coding of the information contained.

To ensure the reliability of the results, the authors analyzed each interview separately, following the theoretical principles of the methodology proposed.²³ Thus, the interviews were assessed without a pre-established set of parameters, which allowed the results to express themselves from the raw data contained within each interview, with special attention placed on the interorganizational relationships that favor innovation. After several rounds of data coding, the researchers combined their results and discussed each case in order to draw up a definitive list of parameters.

At the same time, we compiled internal documents from the organization related to the interactions between BST and other organizations, as well as documents on the strategies, mission, and articles of association.

RESULTS

BST has established an alliance portfolio (Table 2) with organizations stemming from public and private sectors, as well as civil interest groups (primarily associations that promote blood donation and schools), and BST regards these relationships as

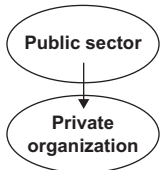
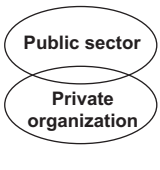
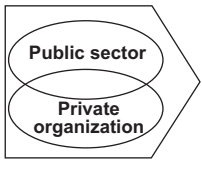
essential for proper project development. As a result, BST directives actively promote the creation of alliances with laboratories, universities, businesses, hospitals, and transfusion centers, among other entities, in an attempt to capitalize on the benefits of synergy. These advantages include sharing project risks, making the project a feasible endeavor, and knowledge exchange with partners in other areas.

An example of the benefits of first case is one of the main alliances of BST, which was developed in the Advanced Therapies Division: a spin-off company "XCelia," which is focused on health promotion through stem cell therapy. The benefits of information exchange can be observed in the results of meetings on the management of information technology systems used by the association of European blood banks. This sector has specific key needs for information management (in terms of product, immediate stock removal or recall of potentially contaminated

samples), and experience can only be provided by other blood banks with similar needs.

The relationship between BST and interest groups in the health system is also redefined by the company's entry into a new market setting: the management of a public umbilical cord bank. BST participates in 2 different alliances in this sector: the Concordia program and the NetCord program. The former is a project that has facilitated the allogeneic use of umbilical cord blood. This initiative, headed by BST, unites the efforts of the health administrations of 5 different Spanish regions and Andorra. The objective is to facilitate the donation of umbilical cords and increase the efficiency of the management process. BST claims that this initiative arose in response to a growing demand from society for high-quality umbilical cord blood for transplants. Through this collaboration between different institutions, the network shares procedural knowledge and experience in order to continue

Table 2
Types of Possible Alliances and Examples From the Blood and Tissue Bank

Organizational agreement	In-house	Traditional contract	Contractual PPP	Institutionalized PPP
Blood and Tissue Bank example	Integrated management of the blood donation process	Construction of the new organizational headquarters: sustainable building	Automation of the blood bag management process	XCelia (stem cells)
Advantages	<ul style="list-style-type: none"> Structuring of the transfusion network in Catalonia Economies of scale Standardized process and quality assurance (improved quality and efficiency) Compilation of knowledge from multiple sectors into a single organization, facilitating the development of services and products with implications for new markets (blood, umbilical cords, immunobiology, tissues, transfusions) Collaboration with third parties in the region Autonomy for management and responsibility for results 	<ul style="list-style-type: none"> Cohesion of the entire team within a single building: management, research, and donations Environmental and energy efficiency, clean rooms, and the possibility of storing new products Intelligent building Extensive knowledge base of the public sector in this type of temporary contract 	<ul style="list-style-type: none"> Development of new technologies in the sector of blood donations Automation of the process: reducing human error, providing real-time updates, increased final quality of the product Allows for the parallel development of processes that previously took place consecutively Introduction of new derivatives 	<ul style="list-style-type: none"> Advancements not previously seen in the scientific field, which would be difficult or impossible without partners Shared risks and benefits Allows for long-term planning; partners are involved in the project strategy
Intensity of the collaboration	—	 <p>One-off</p>	 <p>Strategic</p>	 <p>Integrated</p>
Risks	<ul style="list-style-type: none"> Resistance to change management Creation of a single organizational culture and exportation of management models Creation of a single framework that encompasses the entire process Time required for developing the entire process and simultaneous changes in political leadership (regional and local) 	<ul style="list-style-type: none"> Transportation without incident Correct functioning of the new equipment Risk scenarios and plan B Deviations in cost and time 	<ul style="list-style-type: none"> Investment required to create new products (tailor made) Dependence on the partner A single or few clients A step backwards means a loss in quality Relocation of surplus staff 	<ul style="list-style-type: none"> Distribution of royalties (copyright) Relationship with partners is key Type of law applicable in the case of conflict (national/international) Relationship between the partner company (regional department) and new spin-offs Relationship with the media Management of ideological conflicts
Innovation (organizational or output)	Organizational: in the form of structures, processes, and resources, with the objective of optimizing resources and increasing quality	Output: the building itself, with direct effects on the management of units and processes	Output: improved efficiency of the value chain and increased quality of the end product; alignment with the organization's mission statement: guaranteed quality (zero risk)	<ul style="list-style-type: none"> Organizational: creation of a new organization that is appropriate for this type of business venture Output: the patents generated through spin-offs

PPP, public-private partnership.

carrying out clinical and biological research in this field, while reducing the costs and risks inherent to the procedures and installations involved. Each organization plays its role based on its particular experience and ability to contribute to each project phase.

NetCord, a worldwide organization, works with the objective of creating a forum for discussion and learning amongst all umbilical cord banks, both public and private. A result of this collaboration has been the creation of an international registry of available blood units from umbilical cord donations that can be used in transplantations. Most participating banks are located in the European Union, but there are also partner institutions in the United States, South Korea, and Japan, among other countries. As a result of the success of this partnership, the network is in the process of expansion to include a further 16 banks, which are currently registered as provisional members. The involvement of BST in this collaborative project led to the election of the director of the BST Advanced Therapies Division as the NetCord president (2008–2010).

The innovative capacity of BST has also resulted in the improvement of its production chain. One example is the automation of the blood component elaboration unit. The production line automation process was developed in collaboration with Caridian, a private American enterprise dedicated to the application and development of technological products in the field of blood donation. The close collaboration between these 2 organizations has led to a strategic change in BST's production line, which switched from being a manual process to an automated one. Thus, BST has increased its control over the entry of blood bags, as well as other factors such as bag weight and storage temperature. The overall productivity of the production chain has increased significantly, as well as the quality of the end product.

BST has therefore generated a spectrum of innovations in several fields (both in terms of management and output) thanks to its collaborations with other organizations. Table 2 displays the different types of organizational agreements used in the development of innovation. In some cases, BST decided to operate autonomously (in-house), and in others, it conveyed certain specific responsibilities to other organizations (classical contractual relationship). However, whenever the product or service to be provided was not clearly defined or did not currently exist in the market, BST opted to collaborate more intensely with other organizations through contractual or institutionalized PPP.

Relationship Between Institutional Agreements and Innovation

In the interviews, we observed consistent responses from the management team citing the institutional agreement selected for developing a new project as one of the key factors in the success of innovation. We can deduce that the tighter the relationship between the different organizations, the higher the level of interaction and the greater the capacity for innovation. In this sense, the organizational agreement that generates the closest interaction between both parties—stable in time, with few ideal partners available in the market, aimed toward long-term social impacts (outcomes) rather than mere products resulting from their activities (outputs), in which the partner organizations risk part of their business strategies—would be institutionalized PPPs, as they allow for 2 or more organizations to develop a project together under a unified legal framework.

The academic literature on public management has traditionally analyzed the functioning of specific alliances for an organization. In this study, we have highlighted the relevance of analyzing alliance portfolios constructed by an organization, based on the needs of the company, the degree of maturity of the market,

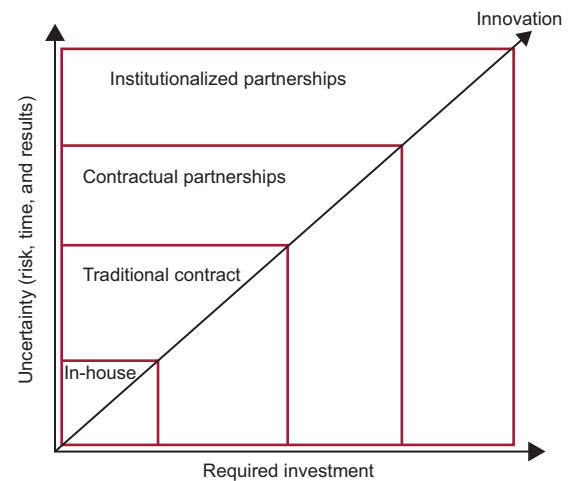


Figure 2. Continuum of organizational agreements that facilitate innovation according to uncertainty and required investment.

the relevance of the project, and the capacities inherent to each party. A strategic management of this portfolio takes into account the overall impact of the alliances held by the organization and the innovations produced therein, and not just the partial vision supplied by a single specific alliance. Therefore, the organizational agreement elaborated for a project and the possibilities of achieving innovative results must be viewed as a continuum of possible alternatives (Fig. 2). At one end, we would have the execution of a project solely using the company's own resources. In these cases, the potential for innovation may be limited due to the absence of external input that could break the mould imposed by the organization. At the same time, this option would have the advantage of avoiding transaction costs and the complexity of negotiations (with internal clients and partners).

As we advance along this continuum, we come to traditional contracts, the first level of a collaborative relationship. In this case, the company establishes temporary contracts with other organizations to implement a project. This project can be carried out by several organizations in the market (competition), it has defined start and end parameters, and involves specific objectives with measurable results. In this case, a one-off interaction is created between the organizations (client-supplier relationship) although it may be more or less intense based on the magnitude of the project. One of the innovation advantages that stems from this type of organizational agreement is the inclusion of other organizations in the development of the project, since this introduces a hybridization between the collaborating partners. This type of public-private relationship is the most commonly used form in the public sector, since it provides many advantages (such as legal security, backing by the public sector, and the possibility of seeking out alternative partners in a competitive marketplace should changes be needed).

In the case of BST, one example of this type of collaborative agreement is that which was signed for the task of designing new headquarters for the bank. The result was an exemplary building developed by the SAAS (*Sabaté Asociados Arquitectura y Sostenibilidad*) architectural group in collaboration with the engineering firms *Consorcio de la Zona Franca* and *Grupo JG Ingenieros*, which designed one of the most energy-efficient buildings to be found in Mediterranean countries. Through innovative technology, the BST building in Catalonia is designed to drastically reduce energy demands both for heating and cooling, thus reducing costs. The building received an A grade for energy efficiency, with a heating, ventilating, and air conditioning system that saves more than 72%

in energy consumption in comparison to a conventional building. This saving is reflected in energy bills: the additional costs for the building (1 million euros from a total budget of 29 million euros) generate a savings of 0.25 million euros/year, saving almost 1.5 GWh/year in energy, and preventing the emission of 963 t of CO₂/year. As mentioned previously, this building was a finalist for the European prize for the most sustainable building of the year.

Progressing further along the continuum, we find the cases in which a project is developed through a shared risk partnership (risk and venture). There are many potential advantages of establishing a partnership.²⁴ Das et al.²⁵ emphasized that organizations that build partnerships can benefit from entry into new markets²⁶ and from obtaining new abilities or capacities.²⁷ They can also increase their share of the market,²⁸ and more importantly, create innovation and transmit, acquire, and exchange information with other organizations.²⁹

In contractual PPP, the organization leading the project is aware of the benefits that can be obtained by strategically working in a long-term partnership with other organizations, since this multiplies the possibilities for finding innovative solutions to the problems at hand. In many cases, these possible solutions (for management or production issues) did not exist before the advent of the collaboration, not only for the organization discussed, but also in the market as a whole. The novel result is the sum of innovations in R+D, productive processes, and the development of new products and services.

In keeping with the discussion on the benefits of intensive collaborations, one of the primary impressions garnered from the interviews in this case was that, in order to produce innovation, a close working relationship with other organizations is essential. This observation is explained by a quotation from an executive director we interviewed who commented on the difference between developing a project alone or in a strategic collaboration with another organization. She explained that “when someone from outside the organization works together with you and is well acquainted with the internal workings of your institution, this is when they can really help you. This person can warn you that you may be wasting your time or doing things inefficiently. If they know your needs and work methods, they can build alongside you, from their own experience and knowledge, and reach solutions for your specific needs. Let’s say they see you trying to toast bread in a frying pan and explain to you how an electric toaster works. Although the final result is fairly similar, since either way you end up with toast, the process has improved, because now you control the final result, with standardized production times and procedures.” In this case, the person interviewed referred to the collaboration between BST and Caridian in automating the process for separating blood components before storage.

The result of the partnership with Caridian was internally valued as a major organizational innovation in the process of handling blood donations. This innovation would not have been possible if BST had attempted to undertake the project alone, not even if the company had bought predesigned machines currently available in the market, since this possibility did not exist for blood banks. This innovation has been recognized by the market, with the result that many blood banks all over the world have implemented similar procedures for separating blood components.

Another finding from this case, which supports the theoretical perspective of this article, is that the level of interaction is much more intense in institutionalized PPP than in contractual PPP. This is because, if contractual PPP already produce developments considered to be strategic for all parties, institutionalized PPP have the added value of integrating the capacity of all partner organizations into the creation of a single organization. Therefore, maximum development is reached by institutionalized PPP, which provide the ideal platform for tackling the most complex

development issues. When science still fails to provide proven models of causality for complex problems—in which the evolution of society and its perception of the issues can have an impact on far-reaching long-term solutions and, therefore, on the involvement of partner organizations in objectives with social impacts (outcomes) rather than indicators of product results (outputs)—we need a firm agreement that brings third parties into the public sphere by creating a new organization.

In this type of partnership, results are not clearly established before they occur and the rules of the game are therefore difficult to determine. This makes flexibility in the creation of a new organization a key factor for stepping outside of the box in terms of organizational structure. During the interviews, the human resources director of BST used the example of XCellia. In his view, the decision to develop the XCellia project as an institutionalized PPP was based on the goal of achieving “a wider range of flexibility in which to work, not only in terms of human resources, but in terms of the whole enterprise.” One of the benefits in the case of XCellia is that operating under the legislative framework of a company instead of a public contracting firm allowed for a much more streamlined process for managing donations provided for research purposes.

Figure 2 shows the relationship between the institutional agreement chosen and the possibility for innovation. The 2 axes provide an guide for managers when choosing the most appropriate model for undertaking a project based on 2 key variables: required investment and uncertainty. In the words of the BST executive directors, innovation has associated costs and risks. As the interaction level with third parties increases through more open interorganizational forms of collaboration, the capacity to enforce direct control over the process diminishes, since this no longer depends on a single organization. Management shifts from direct process to a process carried out with and through third parties, with obvious advantages, but also with traditional transaction costs (different organizational cultures, distinct methodology for creating and understanding projects, etc.). In addition, the capabilities necessary for supervising a project are not the same as those for implementing one. This may entail possible deviations between what is planned and what is finally carried out, along with the associated risks, which are key factors in managing the success of collaborative projects.

The interviewees agreed that the process of developing a product or a new management strategy with a private partner normally concludes with highly positive results. However, they also stated that such a relationship is inevitably more costly than buying the service or product directly from the open market: the issue is that, on certain occasions, the planned developments are still not available as a product for mass consumption. One interviewee concluded that “we are suffering a great deal with some projects because innovation has its costs; it’s not the same as going to the supermarket and buying a product that already exists.” It truly is difficult to foresee what sort of investment will be needed in terms of resources (not just the financial cost) for a product or service that must be developed in collaboration with other organizations. Over the course of the interviews, we listened to several accounts of failures in which the desired results were not obtained. With this in mind, and even though this type of organizational agreement provides major advantages for generating innovation (Fig. 2), it also involves substantial investment and a high level of uncertainty regarding the final results.

CONCLUSIONS

Previous studies of the relationship between innovation and interorganizational collaborations have focused on describing the

organizational structure of collaborations as an innovation.^{2,7} In this approach, a public organization is considered innovative when it decides to form an alliance with another organization. However, in this article, collaborations are not labelled as innovative simply because they exist, but are rather viewed as a vehicle through which innovation can be generated in the form of developing not only new products and services, but also new processes for organizational management. This study theorizes on the different impacts of a variety of institutional agreements that allow organizations in the public sector to collaborate with other businesses and institutions. Collaboration facilitates a hybridization of capacities that are conducive to innovation. However, we also highlight the costs and risks that can be inherent to collaborations, due to the increased resource requirement and the possibility of losing control of the process. As such, we find it essential that public decision makers choose the most appropriate organizational forms to establish a collaboration, based on the complexity of the innovation pursued and the capacities inherent to each organization.

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CONFLICTS OF INTEREST

None declared.

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