

## Article

# Communication and Transparency of Innovation: The Case of the Valencian Community (Spain)

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**Abstract:** Receiving public support for the development of research, development, and innovation (R&D&I) projects means assuming the obligation to comply with the communication and transparency requirements established by state and European regulations. This study presents the assessment of the required measures and their impact made by beneficiary companies based on a questionnaire to 56 institutions that have received a grant through the Valencian Institute for Business Competitiveness (IVACE). Although the companies are inclined towards transparency and value positively the dissemination actions requested, the information they publish is limited and superficial, the improvement that the innovation will bring to society is not disseminated, and hardly any use is made of social networks. It would be very useful for the managing bodies to increase their support to companies that do not have specialised communication staff in order to multiply their impact. In general, communicating the importance of investing in innovation, in addition to a demand for social responsibility and transparency, is also an opportunity for both communication professionals and scholars.

**Keywords:** communication; dissemination; innovation; R&D&I; public aid; subsidies



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## 1. Introduction

Communication actions are essential for public aid. On the one hand, administrations must give adequate publicity to the subsidies they award and, among other measures, publish their regulatory bases in the National Subsidies Database. On the other hand, the beneficiary companies must carry out actions that contribute to transparency and the dissemination of results.

The use and effects of communication on innovation in the framework of public subsidies have recently been the subject of analysis from academia in the framework of the evaluation of the efficiency of mechanisms for business innovation and innovation culture. Thus, recent studies have compared and analysed the regulatory frameworks governing these actions [1,2], described the compliance of beneficiary entities with the measures [3], collected expert opinion on the relevance and effectiveness of such actions [4,5], or assessed the relationship of transparency measures in reducing corruption [6,7].

However, the opinion of the beneficiary companies on these requirements in terms of their own benefits has not been analysed to date. This study aims to synthesise the assessment of communication requirements in public R&D&I calls by their beneficiaries, the companies.

In order to meet our objectives and resolve our hypotheses, an online survey was carried out among all the institutions that have received a grant for their product innovation projects from the Valencian Institute for Business Competitiveness (IVACE), the main body that manages innovation grants in the Valencian Community (Spain).

### 1.1. R&D&I, Dissemination, Transparency, and Impact Measurement

Innovation is among the 17 Sustainable Development Goals of the United Nations (UN) and is one of the fundamental pillars of advanced societies to confront the challenges they face [8]. Such is its importance that the world's major powers allocate a very significant share of their GDP. Within Europe, Sweden (3.3%), Austria (3.1%), and Denmark (3%) lead in R&D investment and far outstrip other countries such as Spain (1.2%) [9].

Despite being essential for the progress of today's societies, innovation requires great effort and risk on the part of companies [10] as R&D&I entails high failure rates [11]. For this reason, governments stimulate its development through public support in the form of direct and indirect aid [12–14].

Poblet et al. [15] conclude that, despite the large amounts that are invested in R&D&I, information on subsidies, and especially their impact, is inaccessible. Thus, they determine the need to link grants with the results of the funded projects themselves, such as publications, patents, or research data. Pedreño-Muñoz and Moreno-Izquierdo [16] corroborate this thesis, indicating that impact is currently neither valued nor measured, and it is essential to establish indicators that allow us to know its repercussion. However, "social impact denotes a field still in formation, which lacks sufficiently consolidated methodologies at the international level for its measurement" [17], p. 177.

Kostoff [18] proposes three key questions for measuring research impact:

- What is the real utility (social, economic, cultural, and environmental) of science and innovation?
- Are science and technology meeting society's most urgent needs?
- Is it feasible to determine the impact of the production and dissemination of new knowledge on social processes?

Receiving public support for the development of R&D&I projects means that the recipient companies are obliged to comply with a series of obligations. Indeed, public calls for proposals include a series of requirements related to communication, which respond to two essential premises: on the one hand, the R&D&I effort would be worthless if the results did not have a real impact on society and, on the other hand, in democratic societies, citizens have the right to know where public resources are being spent.

Communication of subsidised projects promotes science in general [19]), improves the diffusion of innovation, and contributes to citizens' awareness of what their taxes are spent on, but also raises the issues of appropriability [20] and protection of innovation by companies [21].

Making science more accessible to diverse audiences contributes to making it more diverse and inclusive and helps society become more aware of its importance. In addition, deploying creative and more engaging communication strategies can be of great interest to help reach new audiences and connect with young people [22].

Reaching a balance in the measures requested is essential to improve the impact of R&D&I and the management of public resources without having a dissuasive effect on companies. If the required dissemination actions violate the confidentiality of the developments, interest in the aid and in the innovation of companies could be undermined.

### 1.2. The Need for Innovation Diffusion

The diffusion of innovation becomes an important element for its products and processes to have a real impact. In his theory of innovation diffusion, Rogers [23] schematized the process by which an innovation is communicated over time and through certain communication channels to the members of a social system. Since then, the mechanisms for the diffusion of innovation, which were captured in a mathematical model by Bass [24], have captured the interest of researchers. Rogers's and Bass's research has become the origin of numerous papers whose results are compiled and discussed in various literature reviews [25–28].

In the implementation of innovations, advertising and persuasive communication play a key role [29,30]. Dockner and Jørgensen [31] and Tanny and Derzko [32] have confirmed

that the imitation coefficients of an innovation are dependent on communication actions. The importance of communication actions for the diffusion of new products, services, or ideas [33], the relationship between communication actions and imitation coefficients [31], and the need to find the right timing and duration for an effective campaign [34] can be deduced from all works.

In relation to the dissemination process of innovations supported with public funds, Mea et al. [35] point out that it is important for companies to define their communication strategy and dissemination plan before starting the projects. This implies that companies should clearly define their objectives and identify their audiences in order to make an appropriate selection of the media and communication tools to be used [35]. In this regard, Xu et al. [36] emphasise that while advertising has short-term objectives, R&D has long-term ones and conclude that entities should find an “optimal combination of R&D investments and advertising investments” (p. 13). Furthermore, effective segmentation of target audiences is one of the keys to differentiated communications and the development of an optimal communication strategy [37], as each segment has a different perception of science and follows specific information patterns [38]. In addition, the communication strategy of companies may also be conditioned by the stage of the innovation process in which the company finds itself [39].

Although companies have different media to use, the Internet and social networks have proven to be very effective for the dissemination of science in global terms [40,41] and for the dissemination of subsidised R&D&I projects [35,42]. This is because dissemination can be carried out in an agile and easy way, achieving practically immediate visibility [43]. However, despite the advantages of dissemination through social networks, their impact is moderate, as companies do not seem to be using them to publicise R&D&I projects [44]. This moderate impact could be due to the lack of benchmarks on effective communication. There is virtually no access to evaluations of scientific communication, and there are virtually no success stories or examples of ineffective communication that would allow organisations to learn from the experience [45].

Moreover, Cavenaile and Roldan [46] analyse the implications of advertising for economic growth and its interaction with business investment in R&D and find that lower investment in advertising is closely related to lower investment in R&D and slower economic growth. They also show “that innovation subsidies are more effective in an economy that allows firms to advertise their products than in one where advertising is not allowed” [46], p. 6.

### *1.3. The Transparency Requirement*

There is also a rich literature on transparency, understood as “the availability of information about an organisation or actor that allows external actors to monitor the internal functioning or performance of that organisation” [47], p. 576.

Of particular relevance are the studies that address the relationship between transparency and innovation. In this respect, it is worth noting that the scientific literature, in the case of innovation, points to a tension between the benefits and costs of transparency, a tension that has important implications for the development of public policies.

Zhong [48] provides evidence that transparency increases R&D investment, improves innovation efficiency, and increases the conversion of R&D into patents by facilitating the efficient allocation of resources to investment opportunities.

Brown and Martinsson [21] note that transparency reduces information asymmetries between capital markets and firms and increases the possibility of attracting expert capital for R&D and innovation projects. However, they stress that information-rich environments make it difficult for firms to hide their innovative activities from competitors and increase the costs associated with information leakage, which prevents institutions from fully monetising innovation [49].

Transparency in the allocation of R&D&I grants has also attracted the attention of the scientific community and the European Commission itself, which has expressed the need

for member states to make progress on this issue [50]. Therefore, effective communication of the projects supported has become one of the challenges facing European science, and it is expected to be strengthened in the period 2021–2027 [51].

In this regard, works such as those by Pacios et al. [52], which focus on research projects in Spanish universities, conclude that, although the minimum transparency requirements demanded by the legislative framework are met, the information on the R&D&I projects supported is not individualised and is not linked to the results achieved. From the business sphere, Cruz-Rubio [53] points to shortcomings in the implementation of the Transparency Law by large companies, and Beltrán-Orenes and Martínez-Pastor [54] conclude that private entities are not publishing the information required by the law.

#### 1.4. The Regulation of Communication and Transparency in Spain

Beneficiary companies must carry out dissemination actions that contribute to transparency in the allocation of public funds. These measures include the publication of a summary of the project on the website or the inclusion of the logos and/or the mention of the funding body in the communications made. All these actions are included in the Spanish [55–57] and European [58–60] regulatory framework and are mandatory.

In the case of the Valencian Community<sup>1</sup> where the companies analysed are located, the communication and transparency obligations are indicated (publishing the project description on the website, placing the information poster, including the IVACE and Feder logos and emblems, or labelling the subsidised assets), but no further indications are offered to guide the companies when developing innovation dissemination plans.

Moreover, it should be noted that in Spain the disclosure requirements differ between direct aid (e.g., non-refundable grants or subsidised loans) and indirect aid (e.g., tax deductions for R&D&I or patent box). For this reason, the Independent Authority for Fiscal Responsibility [61] proposes the publication of a list of the entities benefiting from R&D&I tax incentives, in order to bring the publicity requirements into line with those for direct aid. Along the same lines, Vilaplana-Aparicio et al. [5] also highlight the need to promote transparency measures in R&D&I tax incentives, such as the publication of aggregated data that allow the scope of this aid to be known.

In this regard, and complementary to the legislation, in order to facilitate the development of communication plans and their subsequent evaluation in European calls for R&D&I grants, the European Commission [62] has developed a manual in which it provides guidelines on how to define communication objectives, select target audiences, and determine the dissemination activities to be carried out. However, at the national level, there is not the same level of specificity in the information provided by the different Spanish autonomous communities in regional aid [63].

The academic sphere has also studied compliance with communication and transparency measures in Spain. Studies related to compliance with communication measures highlight the need to homogenise and update the texts of the regulations and the calls for R&D&I grants themselves [1,64]; the underutilisation of online media in the communication process and the disparity in the publication of content by companies [3]; the need to carry out communication plans with a strategy and a detailed action plan before starting subsidised projects [4]; or the need to adapt media and formats to reach the target audience and enhance the impact of dissemination [5]. With regard to transparency, several authors have shown that, despite the evolution experienced in Spain, there are still shortcomings in its implementation [52,65,66].

For all the above reasons, it is of great interest to make progress on this issue and to know the opinion of companies, which has not been gathered so far, in order to be able to develop future innovation dissemination policies that take into account both the needs for transparency and communication contemplated in the legislation and the requirements of the companies that must carry out these actions. Very strict measures could slow down the development of innovation, which is so necessary in today's society.

## 2. Materials and Methods

The general objective of this study is to describe the opinion of companies receiving R&D&I grants on different aspects related to communication and the requirements in this respect. More specifically, it aims to detail:

- Firms' assessment of the quality of information provided by the public administration.
- The level of awareness of dissemination and transparency measures.
- The appropriateness of the requested dissemination measures.
- The importance that companies attach to these requirements.
- The dissemination actions carried out and the resources allocated:
  - Website and social media presence available;
  - Most suitable social networks to disseminate the results;
  - Human capital dedicated to communication and professional external collaborations;
  - The willingness to engage in non-compulsory communication actions;
  - The assessment of the right time to carry them out.

Our starting hypothesis is that there is a dependency relationship between these variables such that the perception of the quality of information received will influence the fulfilment of dissemination requirements and the importance attached to these requirements will drive dissemination measures.

In order to respond to the objectives and test our hypotheses, the companies that have received aid from IVACE for the development of a product innovation project during the financial year 2019 were selected <sup>2</sup>. This line of aid is aimed exclusively at SMEs <sup>3</sup> located in the Valencian Community, whose activity is framed in any of the headings of section C-Divisions 10 to 33 of the National Classification of Economic Activities (CNAE 2009). Specifically, the population is composed of a total of 78 companies, which started the development of innovation in January 2019 and submitted the justification on 10 February 2021.

The study population was consulted in the file that includes all the aid granted located on the IVACE website <sup>4</sup>. Subsequently, the company's contact details were consulted in the database known as the Iberian Balance Sheet Analysis System (SABI).

Once the sample was selected, an exploratory study was carried out in order to obtain knowledge about the issue [67]. With regard to the method used to obtain the information, an online survey was used with dichotomous questions, with a nominal and Likert scale. The Google Forms platform was used to carry out the questionnaire. This selection is justified for the following reasons: it allows several users to edit in real time; it stores the answers; the data are available online; it is free; and it has a technology that guarantees the necessary security and availability [68].

The survey was carried out prior to the justification of the aid and consisted of 27 questions. Once the questionnaire was compiled, it was validated using the expert judgement method [69]. Specifically, four experts, two specialists in communication and two specialists in R&D&I aid, were asked to give their opinion on the initial information provided and the degree of understanding and appropriateness of the questions asked.

In order to carry out the study, the managers or project managers of each company were contacted and, after being informed that the questionnaire was anonymous and that the data would only be used for statistical purposes, they were provided with the link by e-mail.

A total of 56 companies responded, out of the 78 that make up the study population (71.8%). One company declined to reply, claiming that it would reject the project.

A total of 50% ( $N = 28$ ) of the enterprises are located in the province of Valencia, 42.9% ( $N = 24$ ) in Alicante, and 7.1% ( $N = 4$ ) in Castellón. Of these companies, 37.5% ( $N = 21$ ) have between 11 and 49 workers, 35.7% ( $N = 20$ ) 10 or less, and 26.8% ( $N = 15$ ) between 50 and 250 workers. In terms of turnover, 44.6% ( $N = 25$ ) closed the last fiscal year with a turnover of between EUR 2,000,001 and EUR 10 million, 33.9% ( $N = 19$ ) with less than



EUR 2 million, and 21.4% with a turnover of between EUR 10,000,001 and EUR 50 million. Therefore, the main beneficiaries of product innovation grants are small enterprises.

The data obtained were analysed using SPSS version 26.

### 3. Results

#### 3.1. Businesses' Assessment of the Quality of Information Provided by Public Administration

The opinions that respondents have about the information provided by the IVACE were positive with an average of 3.7 points out of 5 ( $SD = 0.9$ ). Specifically, 19.6% ( $N = 11$ ) consider the information to be very good, 41.1% ( $N = 23$ ) good, 32.1% ( $N = 18$ ) neutral, 5.4% ( $N = 3$ ) bad, and 1.8% ( $N = 1$ ) very bad.

#### 3.2. Level of Awareness of Dissemination and Transparency Measures

In response to the question "Do you know about transparency obligations?" 94.6% ( $N = 53$ ) of the companies claimed to be aware of the transparency obligations, mainly because they were informed by the entity helping them to manage the grants (36.6%) and because they received previous grants (33.8%), as shown in Table 1. As can be seen, having received aid previously may make a difference, even though there is no statistically significant relationship between the source of information and the size of the firm, or the number of workers.

**Table 1.** Source through which companies are made aware of transparency measures.

	N	%
I know of them because the company received other aid previously	24	33.8%
I consulted it on the IVACE web site	5	7.0%
I saw it in the call for proposals for aid	16	22.5%
Through the consultancy/advisory firm that manages the grants for us	26	36.6%
Total	71	100.0%

Source: own elaboration.

#### 3.3. Opinion on the Appropriateness of the Requested Dissemination Measures

A total of 62.5% ( $N = 35$ ) of the companies consider the requested dissemination measures appropriate (Table 2), whereas 3.6% rate them poorly ( $M = 3.7$  out of 5;  $SD = 0.83$ ). There were no statistically significant differences with opinion even though companies with more employees tend to rate measures more positively. This could be due to the fact that larger companies are more accustomed to complying with more standards (such as quality management systems or the system of immediate supply of VAT information to the Tax Agency, which companies with a turnover of more than 6 million euros must comply with).

**Table 2.** Assessment of the requested dissemination measures.

	N	%
Very suitable	8	14.3%
Adequate	27	48.2%
Neither adequate nor inadequate	18	32.1%
Inadequate	2	3.6%
Grossly inadequate	1	1.8%

Source: own elaboration.

On the other hand, companies gave high relevance to these transparency measures ( $M = 3.8$  out of 5;  $SD = 1.1$ ). A total of 26.8% ( $N = 15$ ) considered them very important, 42.9% ( $N = 24$ ) considered them important, and only 16.1% (16.1%) were indifferent or against (14.3%).

### 3.4. The dissemination Actions Carried out and the Resources Allocated

#### 3.4.1. Communication Actions Carried Out

A total of 73.2% ( $N = 41$ ) of the respondents reported that they have carried out some kind of communication or publicity about the subsidised project, compared with 26.8% ( $N = 15$ ) who had not yet carried out dissemination. When companies were asked for their reasons, the following arguments were given: It will be done when the development is finalised; confidentiality; delays in the development or modifications of the website by COVID-19; or delays in the development of the project (mainly by COVID-19).

In terms of the moment at which the companies carried out their dissemination actions, 57.5% did so when the project was approved and 42.5% did so later, during implementation.

The content published differs between beneficiaries. A total of 78% ( $N = 32$ ) published the title of the project, 60% ( $N = 24$ ) a description, 45% ( $N = 18$ ) the objectives, 32.5% ( $N = 13$ ) the budget, and only 20% ( $N = 8$ ) the improvement that the innovation will bring to the society. About 20% ( $N = 8$ ) only published the title and only two companies (4.9%) reported publishing all the information (title, objectives, description, budget, and the improvement it brings to society). Therefore, the diversity in the publication of content makes it difficult to link grants to their results in order to measure the impact of public funds.

This content was disseminated mainly through the website (85.4%) and, to a lesser extent, through social networks (39%), trade fairs and internal posters (14.6%, respectively), press (4.2%), congresses and customer bulletins (4.9%, respectively), and radio (2.4%).

#### 3.4.2. Planned Communication Actions

In addition to the actions carried out, 75% ( $N = 42$ ) of the respondents plan to carry out communication actions when the project ends, through the website (39.8%), social networks (24.5%), and communication at trade fairs (16.3%) (Table 3). Radio (2%), internal communication through posters (2%), and specialised congresses (5.1%) were the least expected to be used. A total of 33.3% only plan to disseminate through one medium, 23.8% through two, 26.2% through three, with the remaining 16.7% using a combination of several media.

**Table 3.** Means envisaged for future communication of the project.

	N	%
Social media	24	24.5%
Web	39	39.8%
Press	10	10.2%
Radio	2	2.0%
Congresses	5	5.1%
Fairs	16	16.3%
Internal signage	2	2.0%
Total	98	100.0%

Source: own elaboration.

#### 3.4.3. Website and Social Networks

All companies have a website, however, only 42.9% ( $N = 24$ ) have a section dedicated to innovation in which they explain the R&D&I developments that the company carries out.

Social media presence is also uneven. A total of 76.8% ( $N = 43$ ) have a profile on Facebook, 69.6% ( $N = 39$ ) on LinkedIn, 58.9% ( $N = 33$ ) on Instagram, 39.3% on Twitter ( $N = 22$ ), 5.9% ( $N = 3$ ) on YouTube, and 1.8% ( $N = 1$ ) on Pinterest and Flickr. It is worth noting that 7.1% ( $N = 4$ ) of the companies do not have a presence on any social network and that entities with profiles on three social networks (28.6%), two (25%), four (19.6%), and one (16.1%) predominate.

### 3.4.4. Social Networks Most Suitable for Disseminating Results

When asked which social networks they consider most suitable for disseminating the results of innovative projects, LinkedIn is rated as the most suitable social network for dissemination, with 76.8% considering it to be conducive. In contrast, Twitter (57.2%), Instagram (46.4%), and Facebook (44.6%) are considered less suitable, although in the case of Facebook the responses are fragmented, with 39.3% considering this network an optimal medium for dissemination (Table 4).

**Table 4.** Social network envisaged for future communication of the project.

	Facebook		Instagram		LinkedIn		Twitter	
	N	%	N	%	N	%	N	%
Very low	14	25	15	26.8	2	3.6	17	30.4
Low	11	19.6	11	19.6	6	10.7	15	26.8
Neutral	9	16.1	10	17.9	5	8.9	7	12.5
High	10	17.9	10	17.9	15	26.8	10	17.9
Very high	12	21.4	10	17.9	28	50	7	12.5
Total	56	100	56	100	56	100	56	100

Source: own elaboration.

### 3.4.5. Communication and External Support Department

Only 30.4% ( $N = 17$ ) have a communication department and this is made up of one or two people (35.3%, respectively;  $N = 6$ ), three (23.5%;  $N = 4$ ), or six (5.9%;  $N = 1$ ). Furthermore, only two entities (3.6%), in addition to having a department, rely on a communication agency. On the other hand, 23.2% ( $N = 13$ ) do not have communication professionals within the organisation but rely on external entities. In other words, 46.4% ( $N = 26$ ) of the companies do not have a communication department nor do they hire professional services specialised in communication.

### 3.4.6. Non-Compulsory, More Convenient Timing and Contribution

If communication and transparency actions were not mandatory, 73.2% ( $N = 41$ ) would still carry them out and 26.8% ( $N = 15$ ) of the organisations would not carry out any communication actions.

There is no consensus on the most appropriate time to disseminate project information. A total of 57.1% ( $N = 32$ ) of respondents believe that the most appropriate time is when the project is completed, 19.6% ( $N = 11$ ) when they approve the project, 12.5% ( $N = 7$ ) sometime after completion, and 10.7% ( $N = 6$ ) during implementation.

What they do agree on is the assessment of the contribution of the requested actions to the dissemination of innovation. A total of 62.5% consider that the required measures favour the dissemination of innovation, 28.6% have a neutral opinion, and 8.9% believe that these actions do not contribute anything. These results are in line with those achieved when asked whether they would be interested in contributing their experience as a success story if requested by IVACE, as 76.8% of the companies would be inclined to participate.

### 3.4.7. Analysis of Dependencies between Variables

After analysing the dependence between the variables (Tables 5 and 6), it can be seen that there is a dependent relationship between the importance given by the companies to the dissemination measures and the opinion on the information provided by IVACE (Table 3). Moreover, this relationship is particularly significant in the case of companies with more employees. Similarly, there is a correlation between the importance given to dissemination actions and the adequacy of transparency actions, with this relationship being stronger as the turnover of the company and the number of employees increases. There is also a clear relationship between the importance attached to transparency and the assessment of the contribution of the requested measures to the diffusion of innovation.



The greater the importance attached to dissemination, the greater the possibility of carrying out communication actions in the case of non-compulsory measures.

**Table 5.** Dependence between the importance attached to transparency measures and a set of variables.

Importance Attached to Transparency Measures		
	Sig.	Spearman's Rho
Opinion on the information provided by IVACE	0.000	0.628
10 or less employees	0.002	0.623
11–49 employees	0.002	0.644
50–250 employees	0.000	0.814
Adequacy of transparency actions	0.000	0.635
Less than 2 million	0.002	0.656
Between 2–10 million	0.016	0.477
10–50 million	0.000	0.914
10 or less	0.003	0.623
11–49	0.000	0.694
50–250	0.002	0.737
Contribution of the requested measures to the dissemination of innovation	0.000	0.461
Would carry out communication action if not obligatory	0.049	0.412 *

\* Cramer's V

Source: own elaboration.

**Table 6.** Dependence between the adequacy of the requested transparency measures and the opinion on the information provided by IVACE and the contribution to the dissemination of the requested measures.

Adequacy of the Requested Transparency Actions		
	Sig.	Spearman's Rho
Opinion on the information provided by IVACE	0.000	0.865
Less than 2 million	0.000	0.950
Between 2,000,001 and 10 million	0.000	0.853
Between 10,000,001 and 50 million	0.001	0.818
Contribution of the requested measures to the diffusion of innovation	0.000	0.474

Source: own elaboration

On the other hand, a statistically significant relationship is also observed between the assessment of the transparency actions requested (Table 6) and the opinion on the information provided by the IVACE, and the contribution of the requested measures to the diffusion of innovation.

#### 4. Discussion and Conclusions

This exploratory study aims to contribute to the improvement of future innovation diffusion policies based on the opinion of the beneficiary companies. To date, the scientific literature has focused on the analysis of regulatory frameworks, compliance with measures, or the views of experts, but has not delved into the views of the main stakeholders.

The results of this study show that companies are aware of the requested measures. However, it is surprising that the main source of information is the consultancy entities that support them. The IVACE website does not generate enough attraction—only 5.7% of the sample has consulted it—so it is necessary to analyse how to enhance it and improve its contents to make it more attractive to institutions.

Respondents rated the information provided by IVACE positively. It remains to be explored to what extent this opinion is maintained in companies that have not succeeded or have not wanted to obtain aid, i.e., non-beneficiaries.

The beneficiary companies consider the minimum communication requirements set out in the regulations governing transparency and aid (law 38/2003; RD 887/2006; and law 19/2013) to be important.

The majority of the enterprises consider the requested measures to be appropriate and attach high importance to them. Furthermore, 73.2% of the companies carried out the requested dissemination actions prior to the project closure. However, in most cases, only the title and description are disseminated and very few companies provide information on the objectives, the budget, or, most importantly, the improvement that the innovation will bring to society. Therefore, it seems that the premises of Plobet et al. [15] and Pedreño-Muñoz and Moreno-Izquierdo [16], that with the information disseminated it is difficult to link grants with their results and measure their impact, are ratified. A thesis to be corroborated in future work is whether firms might not be publishing more information for fear of having difficulties in hiding innovation from competitors or monetising the entire effort made along the lines of Brown and Martinsson [21] and Bloom et al. [49]. One implication of this scarcity of information could derive from the difficulty of appropriability that companies may have [20] because they do not have communication specialists—46.4% do not have specialised staff or external support—and/or because they are unaware of the real value that the diffusion of innovation can bring to the adoption process, as pointed out by Rogers [23].

It would be important for companies with more resources to support and involve their communication departments more in these tasks. It would also be very useful for the managing bodies to increase their support for small and medium-sized companies that do not have specialised communication staff in order to multiply their impact. In general, communicating the importance of investing in innovation, as well as a demand for social responsibility, is also an opportunity for both communication professionals and scholars.

Innovation projects are projects close to the market, with less risk and uncertainty, and it is surprising that they are not communicated more extensively to publicise their results. Moreover, if we take into account the value of publicity and communication in the adoption curve of an innovation [29–32], it is unusual that more than fifty percent of the organisations do not have a section on their website dedicated exclusively to R&D&I. This highlights the need for the managing bodies to work to advise and/or financially support the organisations in terms of communication and to ensure that companies not only comply with the minimum transparency requirements of the law, but also work on a communication strategy prior to the start of the project, as recommended by Mea et al. [35].

Another noteworthy aspect is that although the literature has ratified the usefulness of social networks in the diffusion process of companies [40–42], they seem to be underused by Valencian companies as pointed out by Vilaplana-Aparicio et al. [44]. In turn, the low levels of dissemination through social networks could be due to the lack of specialist staff in the field of communication and the absence of an ad hoc communication plan. Future work should look more deeply into the reasons why social networks are hardly used and whether they are really a suitable tool for communicating the results of innovation to society.

Despite the scarcity of information that is published, companies have shown a willingness to carry out dissemination actions, even when it is not necessary. This aspect highlights the willingness to contribute to transparency processes despite the shortcomings that have been observed in their implementation [53,54]. As has been seen, larger companies attach more importance to communication and make more efforts to disseminate

information. Interventions could, therefore, be designed especially for smaller firms. On the other hand, the opinion on the quality of the information provided by public bodies seems to be a determining factor in encouraging communication efforts for the dissemination of companies.

Although academia has pointed out that communication plans can be modified depending on the stage of the innovation [39], it seems that there is no clear pattern of dissemination in the companies analysed—almost half of the entities that have carried out dissemination did so at the time of approval and the other half during implementation. However, contradictorily, there is a certain consensus that the best moment would coincide with the end of the project or even after some time has passed. Therefore, it is confirmed that companies prefer to delay publication, possibly due to the difficulty of appropriability mentioned by Leiponen and Byma [20], but curiously, they publish in advance. From this, and from the fact that companies are publishing mostly scarce information, it could be inferred that companies do not see a risk in publishing.

This study also has a number of policy implications concerning planned action for best practice in terms of project funding, information, transparency, innovation, and social impact. These implications can be summarised as follows: the need to increase support to companies through the provision of services linked to communication or, failing that, to include it as an eligible concept; to require in grants the implementation of a communication plan that includes minimum communication actions and to audit its execution when the project is justified; to increase communication actions from the managing body itself; and determining a system for measuring the impact of funded projects and of the communication actions themselves, which is transparent. Likewise, as Ziegler et al. [45] point out, there are other relevant policy implications that include providing specific training on scientific communication (both to those being evaluated and to the entities carrying out the developments); providing solid examples that can be used as a reference; and providing sufficient guidelines on the minimum requirements and quality criteria used in the evaluation of proposals.

In the same vein, it would be necessary for managing bodies to reflect on the objectives of the communication itself, as proposed by Weingart and Joubert [19].

Finally, it is important to note that one of the limitations of the study is that only the opinions of the beneficiary companies were collected. Therefore, future studies should include objective elements of contrast.

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## Notes

- <sup>1</sup> Communication and transparency obligations published on the IVACE website: <https://cutt.ly/fKzUuL0>.
- <sup>2</sup> Call information: <https://cutt.ly/SKzUsZ8>.
- <sup>3</sup> According to the European Commission [66], an SME is a company with fewer than 250 employees and a turnover of less than EUR 50 million or an annual balance sheet total of less than EUR 43 million.
- <sup>4</sup> List of aid granted: <https://cutt.ly/4KzUjQm>.

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