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THE DISCLOSURE OF INFORMATION ON SUSTAINABLE DEVELOPMENT ON THE CORPORATE WEBSITE OF THE CERTIFIED PORTUGUESE ORGANIZATIONS

Abstract: *The Internet is a privileged means of communication towards Sustainable Development (SD), where information disclosed knows no borders. The aim of the study is to determine the nature of the content that is disclosed on the corporate website and the profile of the certified Portuguese organizations which disclose information on SD, that is, about Integrated Management Systems (IMS), Corporate Sustainability (CS) and Corporate Social Responsibility (CSR). This research consists of an exploratory analysis of the institutional website of 422 organizations with certified management systems in quality (ISO 9001), environment (ISO 14001) and occupational health and safety (BS OHSAS 18001). The research was based on the content analysis method, which allowed quantifying the contents of the information disclosed on the website by category and subcategories of analysis. The content available on the website was quantified using the Information Disclosure Index (IDI). The certified Portuguese organizations with greater business volume (turnover) and the public limited companies (PLC) disclose more information on SD on their website than the others.*

Keywords: *Sustainable Development (SD), Integrated Management Systems (IMS), Corporate Sustainability (CS), Corporate Social Responsibility (CSR), Corporate Website, Content Analysis*

1. Introduction

Nowadays, the Internet is regarded as a privileged and very important mean of communication, which organizations often use to disseminate different types of information, replacing traditional forms of corporate communication with all interested parties (Pollach, 2003). According to Azapagic (2003), "communication is essential for promoting the concept of sustainable development" at the organizational level (p. 314). Consequently, communication is a requirement of the ISO 9001, ISO 14001 and BS OHSAS 18001 standards published by the International Organization for Standardization (ISO) and by the British Standard Institution (BSI), within the scope of the Quality Management Systems (QMS), Environmental

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Management Systems (EMS) and Occupational Health and Safety Management Systems (OHSMS). In turn, the quality, environment and safety management systems are considered important tools for the implementation of the concept of Sustainable Development (SD) at the organizational level (Asif & Searcy, 2014; Chen, 2004; Ejdys & Matuszak-Flejszman, 2010; Hyršlová et al., 2007; Molamohamadi & Ismail, 2014; Santos & Barbosa, 2006; Santos, et al., 2016; Siva et al., 2016; Ribeiro et al., 2017)). In other words, the implementation of standardized management systems (ISO 9001, ISO 14001 and BS OHSAS 18001) allows addressing issues of SD, as well as of Corporate Sustainability (CS) and Corporate Social Responsibility (CSR) at the organizational level (Steurer, Langer, Konrad, & Martinuzzi, 2005; Santos, G., eta al., 2017). In the CS and CSR framework, organizations adopt appropriate practices from economic, environmental and social perspectives and in their interaction with all interested parties (stakeholders), with the aim of improving the organization, the local community and the society (Steurer et al., 2005; Zwetsloot & Marrewijk, 2004). Recent research proposes for the business universe new conceptual models of integration of management systems, where the Integrated Management System (IMS) of the quality (ISO 9001), environment (ISO 14001) and occupational health and safety (BS OHSAS 18001) include other relevant concepts, such as SD (Chandra, 2013; Oskarsson & Malmborg, 2005; Rebelo et al.,2016,a; Rocha & Searcy, 2012; Rocha, Searcy, & Karapetrović, 2007), CS (e.g., Asif, et al., 2011; Ferreira & Gerolamo, 2016; Santos, D. et al., 2017), CSR (e.g., Asif et al, 2013; Castka et al., 2004) and SD/CS/CSR (Liew & Luetge, 2016; Mežinska et al., 2015; Sakál & Hrdinová, 2016), based on the continuous improvement cycle or PDCA (Plan–Do–Check–Act) cycle and with the focus on the stakeholders' requirements and pressures. Consequently, this approach corroborates the "conceptual model" proposed by other authors (e.g., Asif & Searcy, 2014; Asif et al., 2011). The aim of this study is to determine the content of the communication and the profile of the Portuguese organizations with certified Quality, Environmental and Occupational Health and Safety Management Systems (QEOHSMS), that more prominently use the corporate website to disclose information about IMS, CS and CSR, in the context of the disclosure of information on SD.

2. Literature review

2.1. Conceptual framework

In the last years, the strategy for SD in organizations has become an important issue around the world (Tsai & Chou, 2009). In the literature, the best known and most quoted definition of SD is mentioned in the report "*Our Common Future*", presented in 1987 at the General Assembly of the United Nations (UN) by the World Commission on Environment and Development (WCED), which defines SD as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (UN, 1987). Consequently, the management of the economic, environmental and social aspects of the organizations was increasingly regarded as fundamental requirements for business with worldwide dissemination (Rebelo, et al., 2016,a; Rocha & Searcy, 2012; Santos et al., 2011; Tsai & Chou, 2009; Zeng et al., 2007; Doiro et al., 2017). In order to create competitive advantages and achieve the SD, it has become common practice in many organizations worldwide to implement the QMS (ISO 9001), EMS (ISO 14001) and OHSMS (BS OHSAS 18001), as well as the integration of the three management systems (Jørgensen et al., 2006; Rebelo et al., 2016; Rocha & Searcy, 2012; Rocha et al., 2007; Tsai & Chou, 2009; Zeng et al., 2011). According to Santos et al. (2011), when management systems (QMS, EMS and OHSMS) implemented

individually prove to be consolidated, organizations start a phased process of systems integration, thus yielding the IMS. This has been the general rule that the global organizations have adopted, including those in Portugal. According to Rebelo et al. (2016,a), the ISO 9001, ISO 14001 and BS OHSAS 18001 standards are basic pillars of the IMS (QMS, EMS and OHSMS) and of the concept of SD (economic, environmental and social dimensions). The IMS (quality, environment and safety) are taken as positive forces for SD of the organizations, communities and society (Fresner & Engelhardt, 2004). According to Steurer et al. (2005), at the organizational level, the concept of SD is addressed as CS and CSR issues and implemented in the form of standardized management systems, where the interested parties (stakeholders) play a key role. At the organizational level, the concepts SD and CS are treated frequently as only one concept, that is, the CS/SD (Liew & Luetge, 2016; Sueldo, 2016). Consequently, according to Asif et al. (2011), the concept CS encompasses other concepts, such as the "Triple Bottom Line" or "TBL" (economic, environmental and social) and the "Triple P" or "3Ps" (profit, planet and people). Although the concepts of CS and CSR have evolved from different stories, both head towards a "common future", as they share the same vision, which aims to balance economic, environmental and social responsibilities (Marrewijk, 2003; Montiel, 2008; Santos, 2014). Recently, Liew and Luetge (2016) showed the importance of an integrated approach of the concepts of SD, IMS, CS and CSR, for the future of the scientific research in this theme. In turn, Sueldo (2016) showed the importance of organizational communication with stakeholders, in the approach to concepts of SD, CS and CSR. In the literature, the studies on organizational communication in the scope of the concepts of SD, CS and CSR support the analysis in various theories, such as stakeholder theory, institutional theory, legitimacy theory and resource-based view theory (Ali & Rizwan, 2013; Joseph & Taplin, 2011; Montiel & Delgado-Ceballos, 2014).

2.2. Research model

The study was based on the conceptual model in Figure 1. This model was developed based on the theoretical assumptions of other "conceptual models" published (Ali & Rizwan, 2013; Asif & Searcy, 2014; Asif et al., 2013; Baumgartner, 2014; Nitu & Nitu, 2009; Rebelo et al., 2014; Rebelo et al., 2016,a; Rocha et al., 2007; Sueldo, 2016). The model describes the organizational communication process on SD within the scope of the IMS (QMS, EMS and OHSMS), where the role of the corporate website in the disclosure of information on SD (i.e., IMS, CS and CSR) to all stakeholders is highlighted (Carvalho, 2013).

In the conceptual model, the central axis represents the organization as a solid structure, based on its vision, mission, values, principles and objectives, and these statements support the strategy and policies (organizational culture), which promote the movement of the organization in the direction of the sustained success (Santos et al., 2012). The organization is seen in holistic terms as a dynamic system subject to internal and external adjustments and readjustments, such as those occurring in a modular mechanical structure. The management systems (QMS, EMS, OHSMS, among others), as well as the stakeholders are represented in the model as mechanical gears that promote and influence the organization's movements towards SD (Asif et al., 2011; Oskarsson & Malmborg, 2005; Rebelo, et al., 2016, b; Rocha & Searcy, 2012; Rocha et al., 2007; Steurer et al., 2005; Tsai & Chou, 2009). The model is supported in the Total Quality Management (TQM) philosophy, which is seen as an important tool to implement the concept of SD at the organizational level (Ho, 2010).

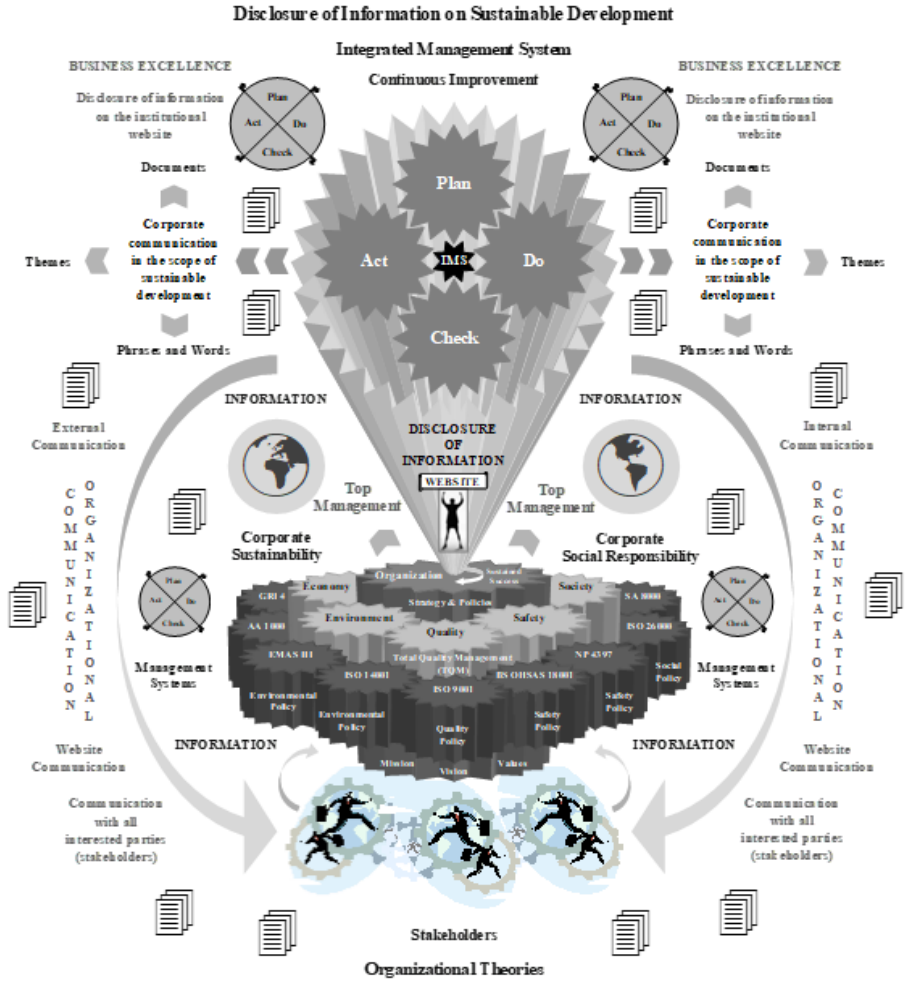

Figure 1. Conceptual model of organizational communication (adapted from Carvalho, 2013)

In turn, the management systems are implemented and maintained in accordance with the principles of the PDCA methodology, which is the basis of national and international standards (ISO 9001, ISO 14001 and BS OHSAS 18001). Consequently, in the proposed model the continuous improvement cycle (PDCA) takes the central position, since it is very relevant to the organization's strategy and policies (organizational culture), as it represents the key factor (motor) that allows and promotes the integration of various management systems (see, for example, Rocha et al., 2007). The IMS is presented in the model as the core element of the management process of organizational communication, since it integrates the various requirements of communication (internal and external) that are at the root of the standards of the management systems. In the model, the corporate website is presented as an open door to the world community, which allows to demonstrate the transparency of the organizational culture followed by the top management in the support towards SD, since information on CS and CSR is easily disseminated to all interested parties of the world, thus demonstrating their legitimacy for business

continuity (Carvalho et al., 2014a, 2014b). The information that is communicated by the organization to the stakeholders is the target of analysis and reflection, aimed at business excellence. Subsequently, the message perceived by the stakeholders will dictate the sentence of the organization's position in the global market. The feedback from stakeholders is communicated to the organization under different forms of information, such as market studies, sales, turnover, shareholder meetings, workers' meetings, customers and suppliers meetings, participation in debates (i.e., discussion) and public forums, satisfaction surveys, complaints, corporate awards, corporate rankings, brand value and manifestations. Holistically, the model aims to show the motivations and benefits associated with the implementation of management systems (QMS, EMS and OHSMS) and their integration (IMS), in the scope of the economic, environmental and social dimensions of SD (Rebelo, et al., 2016; Rocha & Searcy, 2012; Santos & Millán, 2013; Santos et al. 2017). Consequently, the model shows how the concepts of SD, IMS, CS and CSR can be approached in an integrated manner at the organizational level (Liew & Luetge, 2016; Pogutz, 2007; Steurer et al., 2005). In the proposed model the organizational theories (i.e., stakeholder theory, institutional theory, legitimacy theory and resource-based view theory) are the overall foundation (Ali & Rizwan, 2013; Joseph & Taplin, 2011; Montiel & Delgado-Ceballos, 2014).

2.3. Research hypotheses

In order to answer the research question: which the profile of the certified Portuguese organizations in Quality, Environmental and Occupational Health and Safety (QEOHS) that more prominently (i.e., above average) use the corporate website to disclose information on SD (i.e., about IMS, CS and CSR)?, we formulate five (5) research hypotheses according to the following development. According to Ali and Rizwan (2013), there are several the factors influencing corporate social and environmental disclosure practices in the studied countries (e.g., corporate size), whose theoretical foundation is based on organizational theories. The disclosure of information on environmental and social responsibility varies with the size of the organizations (Gray, Kouhy, & Lavers, 1995; Hackston & Milne, 1996). The largest organizations (i.e., size in terms of turnover, number of employees or total assets) seem to disclose more information on the corporate environmental and social responsibility (e.g., Brammer & Pavelin, 2008; Tagesson et al., 2009), CS (Amran, Ooi, Mydin, & Devi, 2015) and CSR (Barros, 2008; Branco & Rodrigues, 2008; Haniffa & Cooke, 2005). The size of the organization has a positive influence on the amount of voluntary information disclosed on the corporate websites (Álvarez et al.,2008). Therefore, it is important in the present study to formulate and test the following hypothesis.

H1: The disclosure of information on SD (i.e., about IMS, CS and CSR) is more prominent in organizations (QEOHS) with greater business volume.

Alves (2005), in a study on the financial information (i.e., economic dimension of SD) on the corporate websites of the 250 most profitable organizations in Portugal, found that the legal form of the organization influences the disclosure of financial information on the Internet. According to Alves (2005), the Portuguese organizations with the legal form of Public Limited Company (PLC) disclose more financial information on their website than the Private Limited Company (LTD). On the other hand, Barros (2008) conducted a research study on 209 Portuguese organizations from different sectors of activity, with a website, and concluded that the organizations with the legal form of the type PLC (i.e., the corporation) do not provide more prominence for the disclosure of information

on the social responsibility (i.e., social dimension of SD) than the others, such as the LTD. Therefore, it is important in the present study to formulate and test the following hypothesis.

H2: The disclosure of information on SD (i.e., about IMS, CS and CSR) is more prominent in organizations (QEOHS) with legal form of the type PLC.

In the literature, several research studies related to the disclosure of information on corporate environmental and social responsibility (i.e., environmental and social dimensions of SD) refer to the existence of significant differences in terms of quantity and quality of information provided depending on the activity sector, that is, the economic sector or industrial sector (Álvarez et al., 2008; Amran et al., 2015; Brammer & Pavelin, 2008; Branco & Rodrigues, 2008; Hackston & Milne, 1996; Haniffa & Cooke, 2005; Tagesson et al., 2009). The organizations "in industries that have a larger potential impact on the environment or in industries with a high visibility among consumers seem to exhibit greater concern to improve the corporate image through social responsibility information disclosure on the Internet" (Branco & Rodrigues, 2005, p. 87). However, according to Alves (2005) and Barros (2008), the activity sector (i.e., the primary, secondary and tertiary sectors) of the Portuguese organizations does not appear as a factor to explain the disclosure of information about the economy (i.e., financial issues) and social responsibility on the Internet. In this sense, the lack of consensus motivated the formulation of the following hypothesis.

H3: The disclosure of information on SD (i.e., about IMS, CS and CSR) is more prominent in organizations (QEOHS) with industrial activity in the 2nd sector.

The motives which lead an organization to "disclose information can be very different depending on its geographic location" (Álvarez et al., 2008). According to Barros (2008), it is expected that organizations located in more developed areas of the country (e.g., the metropolitan area of Lisbon) promote more the disclosure of information on social responsibility on the website. The study of the relationship between the disclosure of information on economy, environmental and social responsibility and the geographic location of the organization has been studied in the past, by several authors (Alves, 2005; Barros, 2008; Gray et al., 1995). Consequently, according to Alves (2005) and Barros (2008), the geographic location of the Portuguese organizations does not appear to be a factor that explains the disclosure of information about the economy (i.e., financial issues) and social responsibility on the Internet. However, this same analysis was never tested under the joint disclosure of information on the corporate website on IMS, CS and CSR. Therefore, it is important in the present study to formulate and test the following hypothesis.

H4: The disclosure of information on SD (i.e., about IMS, CS and CSR) is more prominent in organizations (QEOHS) located in the districts of Lisbon or Setubal.

In Portugal from the 90s to the present day, the annual publication of corporate rankings has been a common practice, by some generalist and specialized press (e.g., "*Revista Exame*", "*Jornal Diário de Notícias*" and "*Jornal Diário Económico*"), which demonstrate theoretically the structure of Portuguese businesses, which face several management issues, such as economic, manufacturing and human capital indicators. The corporate rankings are published and disseminated (in the last years), by the "mass media" (i.e., the media), under the following headings: "*100 Melhores Empresas para Trabalhar*" ("100 Best Enterprises to Work For") and "*500 Maiores & Melhores Empresas*" ("500 Largest & Best Enterprises") published in the "*Revista*

Exame" ("Exame Magazine"), "*1000 Maiores Empresas*" ("1000 Largest Enterprises") published in the "*Jornal Diário de Notícias*" ("Daily News Newspaper") and "*Jornal Diário Económico*" ("Daily Economic Newspaper") and "*Pequenas e Médias Empresas Líderes – PME Líder*" ("Small and Medium-sized Leading Enterprises – SME Leader") published in the "*Jornal Diário Económico*". The published rankings in the media, seek to demonstrate to society the organization's position relative to its competition in the national market, as well as to disseminate organizations' practices and results on how to achieve business excellence. Branco and Rodrigues (2008) quoting other authors, suggest that exposure of organizations to the media is used as a "proxy" for social visibility. In turn, Branco and Rodrigues (2008) consider that the exposure of the organization to the media is positively related to the disclosure of information about social responsibility in annual reports. However, this relationship has not always been observed regarding the disclosure of information about environmental responsibility in annual reports (Brammer & Pavelin, 2008), as well as the disclosure of information about social responsibility on the corporate website (Branco & Rodrigues, 2008). In this sense, the lack of consensus motivated the formulation of the following hypothesis.

H5: The disclosure of information on SD (i.e., about IMS, CS and CSR) is more prominent in organizations (QEOHS) exposed in the media rankings.

3. Methodology

3.1. Research sample

In Portugal, at the end of 2011, the population (i.e., the universe) of the certified organizations in quality (ISO 9001), environment (ISO 14001) and occupational health and safety (BS OHSAS 18001/NP 4397) was comprised of 523 organizations. This study included a sample of 422 (80.7%) organizations from the population, that is, only the organizations that had accessible websites till the date of the content exploratory analysis. We excluded from the sample all certified organizations (QEOHS), which had their websites under construction (including websites for maintenance), as well as all organizations whose website was unavailable or nonexistent. In the case of business groups with a general website, only the organizations that made available a micro website in the overall group website were included in the sample, or when a specific section on the webpage was available (Carvalho, 2013). The graph in Figure 2 shows the breakdown of this relationship.

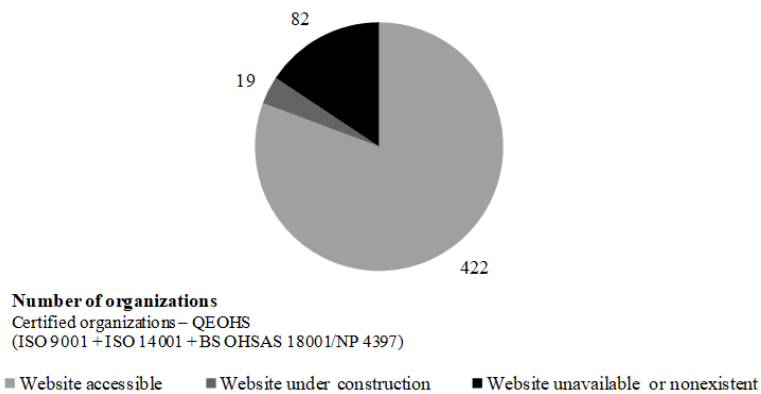

Figure 2. Number of organizations by website type (adapted from Carvalho, 2013).

3.2. Research sample

The research strategy we undertook was based on a survey of the data from websites using the content analysis technique. According to Berelson (1952), "content analysis is a research technique for the objective, systematic, and quantitative description of the manifest content of communication" (p. 18). In turn, according to Weber (1988), "content analysis is a research method that uses a set of procedures to make valid inferences from text" (p. 9). In other words, "content analysis is a research technique for making replicable and valid inferences from texts (or other meaningful matter) to the contexts of their use" (Krippendorff, 2004, p. 18). Content analysis is a common research method or technique in studies that analyze information disclosed by organizations on environment, sustainability and social responsibility in annual reports and/or on their corporate website (e.g., Álvarez et al., 2008; Amran et al., 2015; Barros, 2008; Brammer & Pavelin, 2008; Branco & Rodrigues, 2005, 2008; Dade & Hassenzahl, 2013; Gill et al.,2008; Gray et al., 1995; Hackston & Milne, 1996; Haniffa & Cooke, 2005; Joseph & Taplin, 2011; Tagesson et al., 2009). According to Bardin (2015), the application of the content analysis technique requires the definition of the *corpus*, categories, subcategories and units of analysis (i.e., the words, phrases, themes and documents for analysis). Consequently, in this study the *corpus* was defined as the set of information disclosed on the corporate website. Table 1 presents the relationship of the categories, subcategories and units of analysis, which supported this research.

Table 1. Parameters of the content analysis method (adapted from Carvalho, 2013)

Categories of analysis	Subcategories of analysis	Units of analysis
1. Structure of the corporate website	01. The homepage displays the theme QEOHSMS/IMS 02. The homepage displays the theme CS/SD 03. The homepage displays the theme CSR 04. A section displays the theme QEOHSMS/IMS 05. A section displays the theme CS/SD 06. A section displays the theme CSR	Concept (i.e., the theme)
2. Corporate strategy	07. Mission statement 08. Vision statement 09. Values/Principles statement 10. Strategy/Objectives statement 11. Organizational structure (organogram) statement 12. Management systems statement	Concept (i.e., the phrase)
3. Corporate policies	13. Quality policy 14. Environmental policy 15. Occupational health and safety policy 16. Human resources policy 17. Sustainability policy 18. Social responsibility policy	Concept (i.e., the document)
4. Manuals, codes and other corporate documents	19. Quality manual 20. Environmental manual 21. Occupational health and safety manual 22. Human resources manual 23. Sustainability manual 24. Social responsibility manual 25. Code of good practices 26. Code of environmental impacts and safety risks 27. Code of ethics and corporate conduct	Concept (i.e., the document)

Table 1. Parameters of the content analysis method (adapted from Carvalho, 2013) (continued)

Categories of analysis	Subcategories of analysis	Units of analysis
4. Manuals, codes and other corporate documents	28. Code of corporate conduct and HIV 29. Corruption risk management plan	Concept (i.e., the document)
5. Reports and corporate statements	30. Sustainability report 31. Social responsibility report 32. Environmental report 33. Occupational health and safety report 34. Annual report or corporate report 35. Accounts report 36. Financial report 37. Corporate governance report 38. Environmental statement or performance report	Concept (i.e., the document)
6. Indicators and corporate indexes	39. Indicators and indexes about the QEOHSMS/IMS 40. Indicators and indexes about issues financial (€) 41. Indicators and indexes about issues of CS/SD 42. Indicators and indexes about issues of CSR	Concept (i.e., the theme)
7. Certificates and corporate registrations	43. Certificate of conformity QMS (ISO 9001) 44. Certificate of conformity EMS (ISO 14001) 45. Certificate of conformity OHSMS (OHSAS 18001) 46. Certificate of conformity OHSMS (NP 4397) 47. Certificate of conformity HRMS (NP 4427) 48. Certificate of conformity SRMS (SA 8000) 49. Certificate of conformity SRMS (NP 4469) 50. Register of conformity EMS (EMAS III) 51. Register of conformity BCSD Portugal 52. Register of conformity GCN Portugal	Concept (i.e., the document)
8. Normative references, symbols and corporate brands	53. Reference, symbol or brand QMS (ISO 9001) 54. Reference, symbol or brand EMS (ISO 14001) 55. Reference, symbol or brand OHSMS (OHSAS 18001) 56. Reference, symbol or brand OHSMS (NP 4397) 57. Reference, symbol or brand HRMS (NP 4427) 58. Reference, symbol or brand SRMS (SA 8000) 59. Reference, symbol or brand SRMS (NP 4469) 60. Reference, symbol or brand EMS (EMAS III) 61. Reference, symbol or brand BCSD Portugal 62. Reference, symbol or brand GCN Portugal	Concept (i.e., the word)
9. Corporate projects of involvement with the community	63. Corporate projects in the scope of the QEOHSMS/IMS 64. Corporate projects in the scope of CS/SD 65. Corporate projects in the scope of CSR	Concept (i.e., the theme)

Note: QEOHSMS, Quality, Environment, Occupational Health and Safety Management System; IMS, Integrated Management System; CS, Corporate Sustainability; SD, Sustainable Development; CSR, Corporate Social Responsibility; HIV, Human Immunodeficiency Virus; EMAS, Eco-Management and Audit Scheme; QMS, Quality Management System; EMS, Environmental Management System; OHSMS, Occupational Health and Safety Management System; HRMS, Human Resources Management System; SRMS, Social Responsibility Management System; ISO, International Organization for Standardization; OHSAS, Occupational Health and Safety Assessment Series; NP, Portuguese Standard; SA, Social Accountability; BCSD, Business Council for Sustainable Development; GCN, Global Compact Network; €, Euros.

The categories, subcategories and units of analysis that support the content analysis were defined based on the published literature (e.g., Álvarez et al., 2008; Branco & Rodrigues, 2008; Gray et al., 1995; Haniffa & Cooke, 2005; Joseph & Taplin, 2011; Tagesson et al., 2009). This research was based on the simplest form of content

analysis technique, which is based on highlighting the "presence" or "absence" of information disclosed, that is, each subcategory is analyzed in a dichotomous manner. In other words, two mutually exclusive alternatives, such as "one" (1) or "zero" (0), in which the item of the subcategory is assigned the code or value of 1 (if present), when there is information disclosed in the category, otherwise, is assigned the code or value of 0 (if absent) when there is no information disclosed in the category (Haniffa & Cooke, 2005).

3.3. Research data

The exploratory analysis of the corporate websites of the 422 organizations of the sample was done in two (2) phases (i.e., characterization phase and validation phase) between the months of August and December of 2012. The data collection and analysis was done through a computerized database, developed especially for the research project. The database included several data on the identification and characterization of all certified organizations (QEOHS), by the end of 2011, as well as all data on the disclosure of information on the corporate website, by the end of 2012. The measurement of the reliability of the research data (obtained by applying the content analysis method to corporate website) was determined on the basis of the Krippendorff's alpha coefficient (i.e., the alpha or α), with a value of $\alpha = 0.904$. According to Krippendorff (2004), in the content analysis method, the "data reliability" is acceptable for coefficient values of $\alpha \geq 0.800$ (p. 241).

3.4. Research variables

3.4.1. Dependent variable

The holistic view of the information disclosed on the corporate website was determined through the use of an index. The mathematical formula of the Information Disclosure Index (IDI) on SD, in the scope of the IMS, CS and CSR, was based on other indices published in the literature (e.g., Amorim, 2010; Amran et al., 2015; Branco & Rodrigues, 2008; Haniffa & Cooke, 2005). The IDI is supported on nine (9) categories (i.e., indicators) and sixty-five (65) subcategories (i.e., items) of analysis. The IDI is calculated taking into account the dichotomous classification of each item of the indicators, that is, if a item is disclosed on the website the item is assigned the value of one (1), otherwise, it is assigned the value of zero (0). Equation 1 shows the mathematical expression for calculating the IDI, which is the dependent variable in this analysis. The IDI is a continuous variable (i.e., quantitative variable) that takes on values between $0 \leq IDI \leq 1$.

$$IDI_{SDj} = \frac{\sum_{i=1}^{n_j} \left(C_{ki} \times W_i\right)_{ij}}{\sum_{i=1}^{n_j} \left(M_i \times W_i\right)_{ij}} \quad (1)$$

Where;

IDI_{SDj} – information disclosure index on SD (i.e., about IMS, CS and CSR) of the organization j;

C_{ki} – classification of the item k of the indicator i, who takes the value of one (1) or zero (0);

W_i – weight attributed to the indicator i;

M_i – maximum classification of the indicator i;

j – j-th certified Portuguese organization (QEOHS), with j = 1, …, n;

i – i-th indicator, with i = 1, …, n;

k = k-th item, with k = 1, …, n;

n – number of organizations, indicators and items that support the index.

Note: The weights attributed to the indicators were determined empirically, based on the level of importance of the information disclosed. Thus, we have that W_i assumes the values: $W_1 = 0.040$; W_2 =

0.050; W_3 = 0.150; W_4 = 0.225; W_5 = 0.275; W_6 = 0.035; W_7 = 0.150; W_8 = 0.025; W_9 = 0.050. In turn, we have that n assumes the values: j = 1,…, 422; i = 1, …, 9; k = 1, …, 65. Then, we have that $0 \leq IDI \leq 1$, that is, the IDI takes the value of one (1), when all the items were divulged in the corporate website and takes the value of zero (0), otherwise.

3.4.2. Independent variables

In the study, the five (5) research hypotheses formulated were supported by five (5) independent variables, all of them categorical or nominal variables (i.e., qualitative variables), of the type dummy or binary variables (i.e., each category can take the code or value of 0 or 1), see Table 2.

Table 2. Formulation of the independent variables (adapted from Carvalho, 2013)

Variables	Description
Business volume (BV)	The organization is classified dichotomously (i.e., binary form) according to the business volume, in euros (€), obtained in 2011. When the business volume (i.e., turnover) is among the 1000 largest of Portugal the organization is classified as "Greater" (1), otherwise, is classified as "Other" (0)
Legal form (LF)	The organization is classified dichotomously (i.e., binary form) according to the legal form. When the legal form assumes the designation of Public Limited Company (PLC) the organization is classified as "PLC" (1), otherwise, is classified as "Other" (0)
Activity sector (AS)	The organization is classified dichotomously (i.e., binary form) according to the activity sector. When the activity sector (i.e., economic sector or industrial sector) is framed on the secondary sector (2nd sector) the organization is classified as "2nd sector" (1), otherwise, is classified as "Other" (0)
Geographic location (GL)	The organization is classified dichotomously (i.e., binary form) according to the geographic location. When the geographic location of the headquarters or delegation belongs to the district of Lisbon or Setubal the organization is classified as "Lisbon or Setubal" (1), otherwise, is classified as "Other" (0)
Media rankings (MR)	The organization is classified dichotomously (i.e., binary form) according to the exposure in the media rankings (i.e., included in the rankings), published in 2011 and 2012. When the exposure occurs annually in the media rankings the organization is classified as "Exposed" (1), otherwise, is classified as "No" (0)

3.5. Estimation model

The determination of the profile (i.e., the set of common and significant characteristics) of the Portuguese organizations with certification (QEOHS), in which the information disclosed through the website in the scope of the IMS, CS and CSR is more prominent, was supported by the binary logistic regression model expressed in Equation 2 (see, for example, Kleinbaum & Klein, 2010). The selection and the mathematical formulation of the proposed model were based on others studies published in the literature on disclosure of information (e.g., Barros, 2008; Brammer & Pavelin, 2008). In the estimation model the dependent and independent variables are all binary variables.

$$logit\,[P(IDI_{SD(0,\,1)j} = 1|BV, LF, AS, GL, MR)] = \beta_0 + \beta_1 BV_j + \beta_2 LF_j + \beta_3 AS_j + \beta_4 GL_j + \beta_5 MR_j + \mathcal{E}_j \quad (2)$$

In order to apply the binary logistic regression model (dummy variables) the continuous dependent variable (IDI) was transformed into a categorical variable (binary). Thus, if the value estimated of the IDI for the organization (*j*) is greater that the mean value (i.e., 0.134), then it is assigned the classification "more prominent" (1), otherwise, it is assigned the classification "less prominent" (0). The equation of the proposed model includes the link function (*logit*), the conditional probability (P) of the dependent variable ($IDI_{SD(0,\ 1)}$) take on the category "more prominent" (1), the model coefficients (β), the acronyms of the independent variables (BV, LF, AS, GL and MR) and the error term ($\mathcal{E}$). Thus, the binary logistic regression equation was used to test the research hypotheses.

4. Results

4.1. Descriptive analysis

The graph in Figure 3 presents a holistic view about the items of information disclosed on SD (within the scope of the IMS, CS and CSR) on the corporate website by 422 certified Portuguese organizations (QEOHS). Among the top ten most disclosed items (i.e., subcategories), we have in descending order the following: (1st) management systems statement [12], disclosed by 388 (91.9%) organizations; (2nd) reference, symbol or brand QMS (ISO 9001) [53], disclosed by 360 (85.3%) organizations; (3rd) reference, symbol or brand EMS (ISO 14001) [54], disclosed by 337 (79.9%) organizations; (4th) reference, symbol or brand OHSMS (OHSAS 18001) [55], disclosed by 332 (78.7%) organizations; (5th) a section displays the theme QEOHSMS/IMS [04], disclosed by 284 (67.3%) organizations; (6th) quality policy [13], disclosed by 259 (61.4%) organizations; (7th) environmental policy [14], disclosed by 258 (61.1%) organizations; (8th) occupational health and safety policy [15], disclosed by 257 (60.9%) organizations; (9th) mission statement [07], disclosed by 250 (59.2%) organizations; (10th) the homepage displays the theme QEOHSMS/IMS [01], disclosed by 239 (56.6%) organizations.

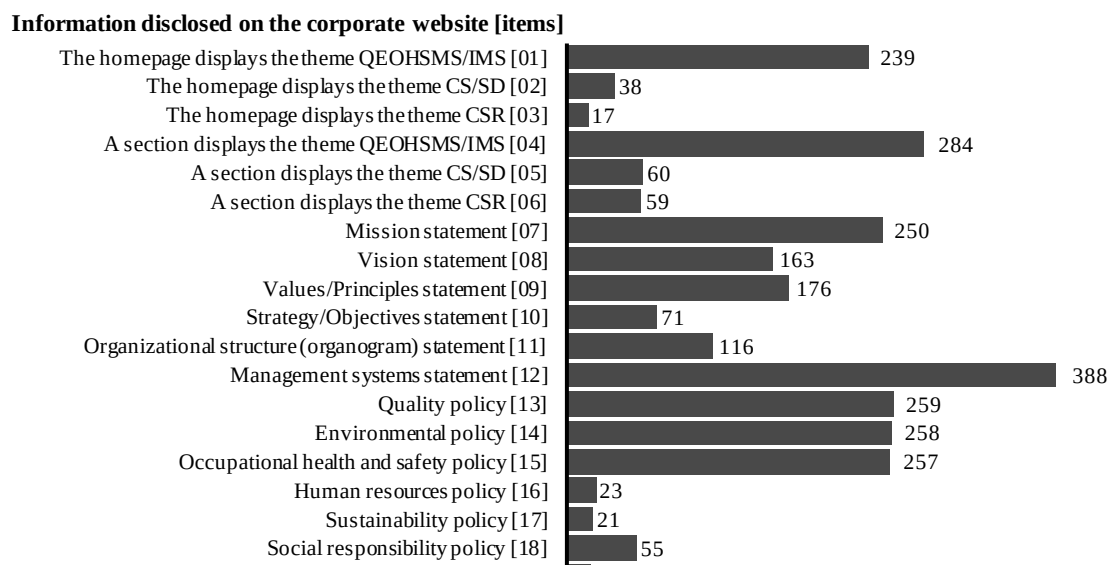

Figure 3. Number of organizations that disclose items (adapted from Carvalho, 2013)

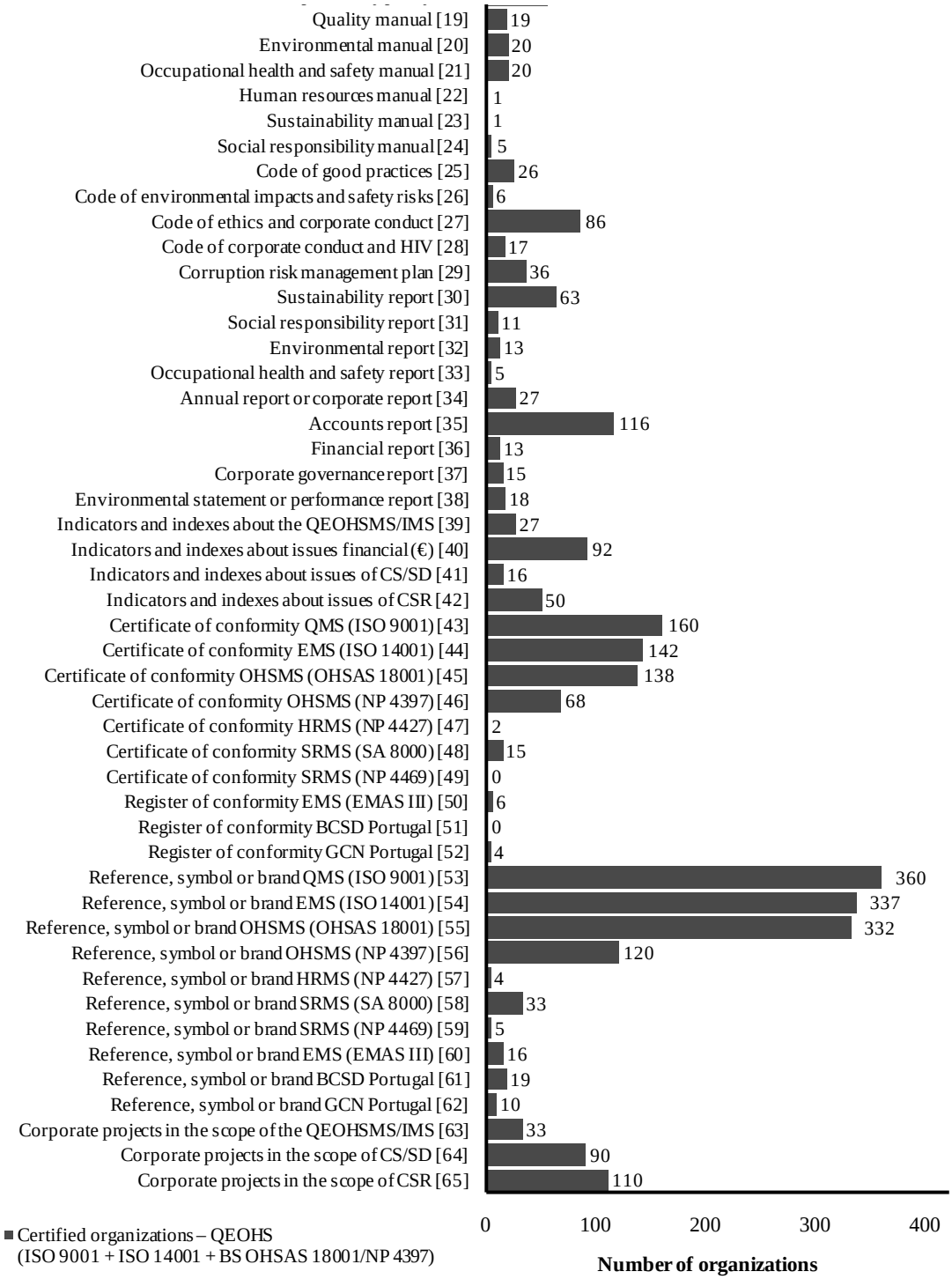

Figure 3. Number of organizations that disclose items (adapted from Carvalho, 2013) (continued)

4.2. Univariate analysis

The dependent variable (IDI) is a continuous quantitative variable that assumes values between 0 and 1. Table 3 presents some statistical parameters that characterize the dependent variable, where the minimum (0.000), maximum (0.571) and mean (0.134) values are highlighted. In turn, the continuous dependent variable (IDI) when transformed into a categorical variable (qualitative), that is, a dummy or binary variable ($IDI_{SD(0,\ 1)}$) assumes the category "more prominent" (1) for 190 (45.0%) organizations and the category "less prominent" (0) for 232 (55.0%) organizations.

In the research study, the five (5) independent variables (i.e., the BV, LF, AS, GL and MR) are all categorical variables, that is, dummy or binary variables (qualitative) and assume the code or value of 0 or 1, according to their classification category. In terms of statistical dimension all categories (0 or 1) include more than 100 organizations.

Table 3. Results of characterization of the dependent variable (adapted from Carvalho, 2013)

Variable	*N*	Minimum	Maximum	Sum	Mean	*SD*	Variance
Information disclosure index (IDI)	422	0.000	0.571	56.572	0.134	0.097	0.009

Note: *N*, Number; *SD*, Standard Deviation

4.3. Bivariate analysis

Following the statistical relationship established between the continuous dependent variable (IDI) and each of the five (5) categorical independent variables (BV, LF, AS, GL and MR), we found that there are differences in the calculated values of the sum and mean of the dependent variable (IDI) by category 0 and 1 of the independent variables (BV, LF, AS, GL and MR), see Table 4. However, these results do not allow us to verify if the differences are significant.

Table 4. Results of the relationship between the variables (adapted from Carvalho, 2013).

	Variables	Dependent						
		Information disclosure index						
H	Independent	*N*	Minimum	Maximum	Sum	Mean	*SD*	Variance
H1	Business volume							
	(0) Other	283	0.000	0.571	33.366	0.118	0.088	0.008
	(1) Greater	139	0.000	0.429	23.206	0.167	0.106	0.011
H2	Legal form							
	(0) Other	114	0.000	0.571	13.328	0.117	0.091	0.008
	(1) PLC	308	0.000	0.456	43.244	0.140	0.099	0.010
H3	Activity sector							
	(0) Other	183	0.000	0.571	25.968	0.142	0.104	0.011
	(1) 2nd sector	239	0.000	0.429	30.604	0.128	0.091	0.008
H4	Geographic location							
	(0) Other	232	0.000	0.571	29.826	0.129	0.096	0.009
	(1) Lisbon or Setubal	190	0.000	0.456	26.746	0.141	0.098	0.010
H5	Media rankings							
	(0) No	177	0.000	0.571	22.536	0.127	0.099	0.010
	(1) Exposed	245	0.000	0.429	34.036	0.139	0.096	0.009

Note: H, Hypothesis; *N*, Number; *SD*, Standard Deviation; PLC, Public Limited Company.

Consequently, in order to determine if the differences detected (see Table 4) in the statistical values of the sum and mean of the dependent variable (IDI) are significant, by categories 0 and 1 of the independent variables (BV, LF, AS, GL and MR), we undertook a nonparametric test (bivariate), that is, the Mann-Whitney U test, which compares the center of location of two samples in order to detect differences between the two corresponding populations (categories). The Mann-Whitney U test was used in the bivariate analysis, since the statistical assumptions of the normality of the dependent variable and the homogeneity of variances between the categories 0 and 1 of the independent variables have not been satisfied. Thus, to examine the normality of the distribution, the Kolmogorov-Smirnov test with Lilliefors correction, as well as the Shapiro-Wilk test, were applied. In turn, the Levene test was used to study the homogeneity of variances. Table 5 shows the results from the application of the Mann-Whitney U test to the research variables.

Table 5. Results of the Mann-Whitney U test (adapted from Carvalho, 2013).

	Variables	Dependent				
		Information disclosure index				
H	Independent	*N*	Sum of ranks	Mean of ranks	Mann-Whitney U test	*p*-Value (one-tailed)
H1	Business volume					
	(0) Other	283	54263.500	191.740	14077.500	0.000
	(1) Greater	139	34989.500	251.720		
H2	Legal form					
	(0) Other	114	21486.000	188.470	14931.000	0.009
	(1) PLC	308	67767.000	220.020		
H3	Activity sector					
	(0) Other	183	39930.000	218.200	20643.000	0.162
	(1) 2nd sector	239	49323.000	206.370		
H4	Geographic location					
	(0) Other	232	47226.500	203.560	20198.500	0.070
	(1) Lisbon or Setubal	190	42026.500	221.190		
H5	Media rankings					
	(0) No	177	35510.500	200.620	19757.500	0.060
	(1) Exposed	245	53742.500	219.360		

Note: H, Hypothesis; *N*, Number; *p*-Value, Probability value or significance; PLC, Public Limited Company.

Consequently, considering that the significance level is 0.05 (i.e., a confidence level of 95%), the results obtained by application of the Mann-Whitney U test show with statistical evidence (*p*-value = 0.000 and *p*-value = 0.009) the existence of significant differences (*p*-value < 0.05) in the bivariate approach of the dependent variable (IDI) by categories 0 and 1 of two (2) independent variables (BV and LF). In turn, the other three (3) independent variables (AS, GL and MR) did not show significant differences between the categories (0 and 1). Holistically, the results of the bivariate analysis suggest statistically that in the certified organizations (QEOHS) with "greater" business volume (turnover) and whose legal form is "PLC", the disclosure of information on SD (in the scope of the IMS, CS and CSR) on the corporate website is more prominent in Portugal.

4.4. Multivariate analysis

The determination of the profile of the

certified Portuguese organizations (QEOHS) in which the disclosure of information on SD (in the scope of the IMS, CS and CSR) on the corporate website is more prominent was supported by the binary logistic regression model. The assumption of the non-occurrence of multicollinearity was verified with: (i) correlations matrix (Pearson correlation); (ii) collinearity statistics (tolerance and variance inflation factor); (iii) collinearity diagnostics (eigenvalue, condition index and variance proportions). Table 6 shows the results of the application of the binary logistic regression model.

Table 6. Results of the binary logistic regression model (adapted from Carvalho, 2013).

H	Independent variables	β	*SE*	Exp(β)	Wald	*p*-Value
H1	Business volume	1.156	0.282	3.177	16.828	0.000
H2	Legal form	0.468	0.241	1.596	3.760	0.027
H3	Activity sector	-0.207	0.220	0.813	0.884	0.174
H4	Geographic location	0.213	0.213	1.237	0.995	0.160
H5	Media rankings	-0.472	0.267	0.624	3.112	0.039
	Constant	-0.641	0.266	0.527	5.821	0.008
	Statistical parameters of the binary logistic regression model				Statistics	*p*-Value
	• Overall statistics – Chi-square (χ^2)				29.009	0.000
	• Overall percentage – Percentage correct (%)				61.800	–
	• Omnibus tests of model coefficients – Chi-square (χ^2)				29.672	0.000
	• -2 Log likelihood				551.157	–
	• Cox & Snell – R-square (R^2)				0.068	–
	• Nagelkerke – R-square (R^2)				0.091	–
	• Hosmer and Lemeshow test – Chi-square (χ^2)				0.973	0.499

Note: H, Hypothesis; β, Regression coefficient; *SE*, Standard Error; Exp(β), Exponential regression coefficient; Wald, Statistic test; *p*-Value, Probability value or significance (one-tailed).

Consequently, considering that the significance level is 0.05 (i.e., a confidence level of 95%), the results obtained by application of the binary logistic regression model show with statistical evidence (*p*-value = 0.000, *p*-value = 0.027 and *p*-value = 0.039) the existence of significant differences (*p*-value < 0.05), in the approach to three (3) independent variables (BV, LF and MR). However, an analysis of the regression coefficients (β) shows that only the coefficients with positive sign (+) increase the predicted probability of the model, that is, the positive coefficients contribute to the success of the conditional probability [$P(IDI_{SD(0,\ 1)} = 1|BV, LF, AS, GL, MR)$] in study (see, for example, Hair, Black, Babin, & Anderson, 2009; Kleinbaum & Klein, 2010). Thus, according to the multivariate analysis only two (2) independent variables (BV and LF) contribute more prominently to the disclosure of information on SD, corroborating the results obtained in the bivariate analysis. The statistical parameters show that the model has a moderate adjustment power. Table 7 presents the results of the hypothesis test by applying the binary logistic regression model.

Table 7. Results obtained by the application of hypothesis testing (adapted from Carvalho, 2013).

Research hypotheses tested with the binary logistic regression model				
H1	H2	H3	H4	H5
Accept	Accept	Reject	Reject	Reject

Note: H, Hypothesis.

In the statistical analysis, the type II error associated with the rejection of the hypothesis H3 is 11% and 8% for hypotheses H4 and H5. On the other hand, the power of the test for hypothesis H3 is 89% and 92% for hypotheses H4 and H5.

5. Discussion

Holistically, the descriptive statistical analysis of the results shows that Portuguese organizations with certification of management systems (QEOHS) often use the corporate website to disclose information about the certified management systems. However, the information disclosed on the website on SD (within the scope of the IMS, CS and CSR), currently, are very small and concentrated essentially on ten (10) items. According to the univariate, bivariate and multivariate analyses, it was possible to determine the profile of the organizations where the disclosure of information on the website is more prominent. The larger organizations, that is, with greater business volume (turnover), disclose more information on SD (i.e., about IMS, CS and CSR), thus, the results obtained corroborate the conclusions of other previous studies around the dimensions of SD (e.g., Álvarez et al., 2008, Amran et al., 2015; Barros, 2008; Brammer & Pavelin, 2008; Branco & Rodrigues, 2008; Haniffa & Cooke, 2005; Tagesson et al., 2009). The Portuguese organizations that assume the legal form of PLC disclose more information on SD (i.e., about IMS, CS and CSR), thus, the results obtained corroborate the conclusions of another previous study about the economic dimension of SD (Alves, 2005). In Portugal, the organizational factors, such as the activity sector, geographic location and media ranking (i.e., media exposure) are not relevant explanatory factors to explain the disclosure of information on SD (i.e., about IMS, CS and CSR), thus, the results obtained corroborate the conclusions of other previous studies around the dimensions of SD (e.g., Alves, 2005; Barros, 2008; Branco & Rodrigues, 2008).

6. Conclusions

Currently, the Portuguese organizations with certification (QEOHS) rarely use their corporate website to communicate contents about IMS, CS and CSR, that is, for the disclosure of information on SD. The profile of the certified Portuguese organizations that more prominently use the corporate website to disclose information about IMS, CS and CSR, in the context of the communication of information on SD is, essentially, formed by organizations that have a greater business volume (turnover) and whose legal form assumes the designation of PLC. In Portugal, the other factors studied within the scope of the profile of the certified organizations, such as the activity sector, the geographic location and the exposure in the media rankings, did not present significant statistical evidence. Holistically, we conclude that the organizations through the certification (QEOHS) demonstrate to the stakeholders that the principles of SD are present in their strategy and policies (organizational culture). However, the contents related with the SD (i.e., about IMS, CS and CSR) are not properly communicated through the corporate website to all interested parties.

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