

## **Local Authorities and the Disclosure of Financial Information via the Internet: the Portugal Case**

### **ABSTRACT**

In the context of New Public Management, Public Administration must be alert to the increasing needs of citizens, providing public organizations with effective and efficient management systems in order to rationalize the financial resources and disseminate transparent, accurate and consistent economic and financial information to further assess the performance of managers and organizations.

There have been recent advances in the field of Information and Communication Technologies that have influenced the way financial information is disseminated. These advances include the use of the Internet as a means of disclosure of financial information, allowing it to be accessed more quickly and by a larger number of users.

This work was based on the assumptions of agency theory, public choice theory and signaling theory, and has as main objectives to assess the level of disclosure of financial information on the websites of local authorities in Portugal and the identification of possible factors that may influence the level of disclosure.

Given the results in this study, it is time-consuming and difficult to find financial information on the websites. This hinders the users in their assessment on where and how mayors apply public resources. Among the factors tested, the size and political competition are the ones that seem to influence the level of disclosure of financial information on the website.

**Key words:** disclosure of financial information, the Internet, local authorities, agency theory, signaling theory, public choice theory

## Introduction

In the context of New Public Management, Public Administration should both focus on the citizen's needs, which are increasingly demanding, and promote the transparency and efficiency of public management. In this way, it should provide the public bodies not only with effective and efficient management systems so that managers can rationalize the decision making process, aiming at improving the public services, but also with incentives for disseminating the economic and financial information, in a clear, rigorous and coherent way. This form of disclosure endows the different stakeholders with information that enables the assessment of the manager and organizations' performance. In the context of the New Public Management, the role played by the accountability of the manager and public organizations is very relevant. And, according to the Governmental Accounting Standards Board, GASB (1987), the financial report has an important role regarding the fulfillment of duty by the government, making it publicly responsible, in a democratic society where managers must be answerable to citizens in what concerns the use of resources.

The International Federation of Accountants, IFAC (1991), considers citizens as the main users of public entities' financial information. We understand that in the field of Public Administration, the financial report gains a greater importance, because, in addition to serving as a basis for the decision making, it also makes it possible to control legal obligations and management of public resources.

Through International Public Sector Accounting Standard (IPSAS) number 1 (IPSAS no. 1), IFAC defines that financial statements aim to provide information about an entity's financial position, financial performance and cash flows, which is useful to a great number of users in the decision making; give information about the way the resources were obtained and used, referring whether the value included in the local authority's budget, the legal or contractual provisions, the financial limits set are met and make entities responsible for the resources that were entrusted to them.

In Portugal, the Official Plan of Public Accounting<sup>1</sup> (OPPA), refers that *“the availability of accounting information proves to be absolutely essential to allow the analysis of public expenditure in compliance with the legal criteria, economy, efficiency and*

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<sup>1</sup> Approved by Decree Law No 232/97 of September 3.

*effectiveness and, on the other hand to reinforce the clearness and transparency in the management of public money and in the State's financial relationships".* The Official Accounting Plan for the Local Authority<sup>2</sup> (OAPLA), when referring to financial information, defines the documents to adopt by all the local authorities and settles that regarding these documents, the “*local authorities publicize, up to 30 days after appreciation and approval by the governing body*”.

In addition to the demands on useful information for the decision making “*technology has changed the way public organizations relate to the public*” (Rodríguez, Caba e López, 2007, p. 142). Recently there have been great advances in Information and Communication Technology that influence the way financial information is disseminated. These advances include the use of the Internet as a means of disseminating financial information, allowing it to spread more quickly. Considering this evolution, the Law of Local Finance enhanced the duty of publicizing financial information, compelling the local authorities to make the estimates documents and presentation of accounts of the current year and the two previous years available on their websites.

Given the context described, this paper intends to address the issue regarding **the level of disclosure of financial information via the Internet and the factors that influence the local authorities in Portugal on this disclosure**. We aim at achieving two objectives with this paper. On the one hand, we intend to assess the level of disclosure of financial information on the websites and consequently verify whether the local authorities in Portugal are in compliance with the demands required by the Law of Local Finance. On the other hand, to identify possible factors that may influence the eventual difference in the level of disclosure.

The literature review made it possible to identify the reasons which justify the study of the problem, both for their possible contribution for the development of the theories it is based on and because the work carried out does not show consensual results regarding the manager's motivations. Furthermore, in the perspective of identifying factors that may influence the level of disclosure of economical and financial information, it was not possible to pinpoint any study in the context of local authorities in Portugal.

This paper is organized in the following way: in section 2 we provide the theoretical framework, mentioning some theories, namely the agency theory, public choice theory and

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<sup>2</sup> Approved by Decree Law No. 54-A/99 of February 22.

signaling theory. These theories, already referred to in some studies, tried to identify explanatory factors of disclosure of economic and financial information via the Internet. Then, we refer some studies related to this subject which were conducted in the public sector. In section 3, we identify the problem and formulate research hypotheses. In section 4, we provide details about the data, the variables being studied and the adopted methodology. In section 5, we proceed with analysis of data collected from research, trying out the hypotheses being studied. At last, in section 6, we draw some conclusions and provide some proposals for future studies.

### **Theoretical framework and hypotheses**

The agency theory establishes that in an agency relationship the principal delegates authority to the agent, regarding the decision making. (Jensen e Meckling, 1976). The agent does not always act according to the interest of the principal, what leads to incurred agency costs, resulting from using monitoring<sup>3</sup> mechanisms and from residual losses<sup>4</sup>. The problem of the agency is found in all organizational contexts, and particularly in the public sector. As the maximization of the politician's well-being depends on their reelection, they tend to conveniently act in their best interest, (Zimmerman, 1977).

The public choice theory conceived by Buchanan e Tullock (1962) aims to study the behavior of the various interest groups in the political context: the local mayors/politicians, citizens/voters, political parties, election process, bureaucracy analysis, taking as guiding principles the same followed in economic science (Pereira, 1997). In the political process (for example in the mayor's election or in the delegation of competences for public functions) there are individuals who gain power. However, these not always act in the best interest of citizens. Therefore, in this process, competition can create conflicts of interest between the principal and the agent (Ferreira, 2011). In this context, and in the case of local authorities, we can see the existence of conflicts of interest whenever mayors act focused on their reelection and not on meeting the citizens'/voters' needs. Lourenço, Jorge e Sá (2010) refer that this theory is connected to the idea of New Public Management, in which a diversity of concepts and practices justify a greater commitment of citizens and call on the importance of

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<sup>3</sup>The term monitoring does not only comprise the measurement or observation of the agent's behavior but also the effort made by the principal to control the agent's behavior, for instance through budgetary constraints, compensation policies, operational rules, etc. (Jensen e Meckling, 1976).

<sup>4</sup> Residual losses result from the difference between the level of well-being effectively attained and the one that could be obtained if the agent behaved ideally (García, 2000).

transparency and accountability in public processes of planning and decision. Lourenço, Jorge, Sá e Rolas (2011) refer that the changes occurred in the area of political theory enhance the importance of citizens' participation in the public processes of deliberation and decision making.

The signaling theory aims to analyze situations in which one of the parties of a contract is interested in signaling aspects which are presumably favorable to their performance (Watson, Shrivies e Marston, 2002). Signaling consists in emitting signals (information) which enhance situations that result from the organization's activity. This emission can occur when managers decide to voluntarily disseminate information via the Internet, with a clear intention of signaling an efficient, effective and transparent management (Laswad, Fisher e Oyelere, 2005) and Watson *et al.* (2002) prove the fact that this theory, in a certain way, explains the voluntary disclosure of financial information. This theory suggests that the asymmetry of information can decrease when the party which has more information sends signals (information) of interest to the party with less information (An, Davey e Eggleton, 2011).

Based on the theories referred, a diversity of studies about the disclosure of financial information via the Internet was carried out. These are briefly described in the following paragraphs.

Laswad *et al.* (2005) conducted a study to 86 local authorities from New Zealand, in which the authors tried to analyze the determinants of the disclosure of voluntary financial report via the Internet. The relationship between the voluntary disclosure of financial information via the Internet was tested: leverage, municipal wealth, visibility of the press, size and political competition. The results indicate that the leverage, the municipal wealth and the visibility of the press are the ones that influence the level of voluntary disclosure of financial statements via the Internet. As for the variables size and political competition the study demonstrated that there was no relationship with the voluntary disclosure via the Internet.

Caba, López e Rodríguez (2005) carried out a study in the European Union (EU) countries, in which they aimed to verify the way the governments use the new technologies of information and communication to make information about public finance available to citizens, enabling them to evaluate the public management and to confirm its efficiency, effectiveness and economy when using public resources. The authors created a disclosure index obtained from three partial indices (disclosure index of type of information made available, qualitative disclosure index of accounting information characteristics and disclosure

index of navigability, design and access). In addition to verifying the level of information disseminated online based on the created index, they aimed to evaluate whether the financial record is complete, current, intelligible, clear, comparable, relevant and trustworthy and tried to confirm if governments have made an effort to project user-friendly websites.

The results made it possible to conclude that the EU governments do not use the Internet as a means to improve transparency of financial information and presentation of accounts to citizens. They also concluded that there is the need to standardize the information systems to access the main financial data. We highlight the fact that the disclosure index in Portugal is 64.4%. From the fifteen countries included in the study, Portugal is the one which presents a higher index.

García e García (2008) conducted a study using 334 Spanish municipalities with over 20.000 inhabitants as a sample. With this study, the authors aimed to evaluate the determinants for the disclosure of financial information via the Internet. They studied the possible relationship between the level of voluntary disclosure of financial information and the variables: size, level of indebtedness, level of investments, political competition and municipality notoriety. From this study they concluded that there was a positive and significant relationship between the disclosure level and the variables: size, level of investment and political competition, as well as a considerable negative influence between the level of disclosure and the level of municipality notoriety. This study reveals that only a limited number of municipalities voluntarily make their financial statements available online.

Wanting to evaluate the amount of economic and financial information disseminated on the Internet and determine the factors that influence the level of information disclosure on the websites of Spanish municipalities Gandía e Archidona (2008) took the Web Quality Model as a reference point. For this study the authors considered the characteristics of the web resources in what concerns presentation, easy navigability and content of websites, and created a weighed disclosure index subdivided into five partial indices (general information; budgetary information; financial information; navigability and presentation; relational sub-index). With the application of the multiple regression model, the authors referred above tried to explain the variability of the indices according to the following independent variables: political competition, municipal wealth, leverage, visibility of the press, access to technology and citizens' level of schooling. According to the study results there is a positive correlation between the disclosure level of voluntary information and all considered independent variables, except to the variable leverage.

The work created by Lourenço *et al.* (2010) intended to analyze the information made available on the websites of a hundred city councils of the central region taking the eight principals of Open Government Data (proposed by the Open Government Working Group) and the Public Contracts Portal as a reference, and focusing on items essentially related to the financial information. The authors tried to analyze the type of information disseminated, how people can have access to it and the format in which it is presented and made available. The results indicate a partial disclosure of information on the websites, incorporated into large documents, making it difficult to be identified. The strategy to make information available as an image in order to strengthen its legality through addition of signatures of public governors hinders the editing of this information by the citizens. The authors concluded that the access to information items is conditioned by the lack of a specific and clearly identified area, in which the items could be listed. Considering that all the information items are mandatory to the diverse official entities<sup>5</sup>, the results seem to indicate that some city councils do not consider relevant that they are disseminated in their website.

Álvarez, Domínguez e Sánchez (2010) carried out a study aiming to analyze the factors that influence the level of performance of the Electronic Government of 81 municipalities all over the world. The factors taken into consideration were those which contribute to the efficiency of digital administration, as for example the organizational complexity (internal characteristics), the institutional capacity (financial resources) and political factors. A number of dependent variables were analyzed, such as safety/privacy, usability, contents, services, and the citizens' participation and as control variables the development of Electronic Government and the country's economic performance. The results revealed a positive correlation between the internal capacity of the municipality and the level of technological and economic development, a positive relationship between the political competition and the level of disclosure, a positive relationship between the variable size and safety/privacy of websites. None of the independent and control variables analyzed have explanatory power when usability was analyzed. This study makes it possible to conclude that the level of improvement of services provided online is associated to technological development due to the complexity of local administration and to the institutional capacity. As for the development of Electronic Government, it can be seen as an opportunity to improve the information made available, with the Internet becoming a means to disseminate economic and financial information, thus contributing to the transparency of public management.

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<sup>5</sup> For example to the Court of Auditors and the Directorate General of Local Authorities.

In a work developed by Lourenço *et al.* (2011) the information that the Portuguese local authorities (more precisely city councils) make available on their websites was analyzed. The financial information or the information with direct financial impact, the visibility of this information and the format in which it is made available were taken into account. The authors concluded that overall city councils' websites only make a very limited number of economic and financial information available, with poor visibility and in formats which do not allow the autonomous and automatic processing, contrary to the principles of Open Government.

Hermana e Silfianti (2011) set out to evaluate the performance of public services through the websites of Indonesia's local authorities. Focusing on the websites of local authorities (provincial, district, and cities), an exploratory study was carried out in order to identify the digital gap in Indonesia's local authorities. Three groups of variables were analyzed: the characteristics of services made available on the websites, their popularity and visitor counters. The results showed that the local authorities have not used the websites as means to disseminate information and that there is a digital gap between the various local authorities. The cause may lay on the difference of infrastructures of existing telecommunications. The study also shows that for all used metrics the values found for the disclosure in the districts are lower than the ones found in provinces and cities.

Given the number of studies analyzed we can determine that some of them only intend to evaluate the level of disclosure<sup>6</sup> of financial information via the Internet, whereas others aim to evaluate the relationship between the level of disclosure and a number of factors which aim to identify the determinants of the disclosure of financial information via the Internet. From the factors studied, the ones which reveal some level of influence in the level of disclosure are: size, according to the studies conducted by García e García (2008), Gandía and Archidona (2008) and Álvarez *et al.* (2010); political competition, according to the studies conducted by García e García (2008), Gandía e Archidona (2008) and Álvarez *et al.* (2010); leverage, according to the studies conducted by Laswad *et al.* (2005), García e García (2008); the impact of the media according to work by Laswad *et al.* (2005), Gandía e Archidona (2008) and García e García (2008) and municipal wealth according to Laswad *et al.* (2005) and Gandía e Archidona (2008).

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<sup>6</sup> The level of disclosure is measured through an index which is a numeric indicator representative of the amount of information disseminated and it aims to determine the level of disclosure on the communication channel under analysis (García-Meca e Martínez, 2004).



## *Hypotheses*

In Portugal, local authorities must publicize up to thirty days after appreciation of a number of estimates documents and presentation of accounts by the governing body<sup>7</sup>. The Law of Local Finance<sup>8</sup> came to reinforce this duty, predicting the provision not only of these documents but also of further information in the respective websites, compelling, in the same way, to make the presentation of accounts of the last two years available. These demands intend to allow citizens to follow up the mayor's management, contributing to the mayor's transparency and accountability.

The studies analyzed in the literature review allowed to pinpoint factors which help entities to present different levels of disclosure. Nevertheless, the studies indicate divergent or even contradictory results, based on the referred theories about the determinants of the level of disclosure of financial information via the Internet. In addition, the studies found about Portugal, only evaluate the level of disclosure via the Internet, not identifying determinants which may explain this index.

In a local authority, the manager (mayor) is the party which holds more information. Due to asymmetric information, citizens can only evaluate the public management from the information disseminated by the mayor and this can increase the level of financial disclosure, signaling positive aspects that lead to a positive evaluation of their performance. According to agency and public choice theories, this signaling is done with the reelection in mind.

Thus, the research problem we pose is to know **the level of disclosure of financial information via the Internet and the factors that influence the local authorities in Portugal on this disclosure.**

To address the research issue, we considered the research hypotheses explained below.

The studies which tested whether the size of the local authority is a factor which influences the level of disclosure found evidence that it is a variable with explanatory power, since in most referred studies the results presented a positive association between the size and the level of disclosure of financial information. However, Laswad *et al.* (2005) could not prove that the size was a variable with influence on the level of disclosure.

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<sup>7</sup> Article 4 of Decree Law No. 54-A/99, February 22.

<sup>8</sup> Article 49 of Law No. 2/2007, January 15.

Thus, we suppose that it justifies testing if the local government's size is a factor that influences the level of disclosure of local authority in Portugal.

In Portugal, as previously referred, there is legislation which compels local authorities to disseminate financial, budgetary and provisional information on their websites. In compliance with the signaling theory, we perceive that the local authority's size is a factor which influences the level of disclosure. Thus, it is expected that the mayor is a target of scrutiny, namely, by the opposition parties. Hence, the mayors of bigger authorities will tend to disseminate all the information required by law in order to signal they are complying with the legislation in force. In this way, we consider hypothesis H<sub>1</sub>.

H<sub>1</sub> – “There is a positive association between the size of the municipality and the disclosure index of economic and financial information through the Internet”.

As established in the agency theory, the maximization of the politician's/mayor's well-being depends on their reelection. They thus tend to act in their best interest. This is reflected on the disclosure of information which allows to evaluate their performance. As for the public choice theory, which bases its analysis on the behavior of the individual within organizations, it demonstrates that in a political process the individuals act with rationality and selfishness. Taking this theory and the signaling theory into consideration, the mayor tries to show aspects which are favorable to their performance.

The results of most studies referred in the literature review converge along the lines of the existence of a positive correlation between political competition and the level of information disclosure. However, the results obtained by Laswad *et al.* (2005) did not confirm this relationship.

Given this, we believe there are grounds to continue studying the influence of political competition in the disclosure index.

Considering what is advocated by the signaling theory, our conviction is based on the possibility that the mayors who are subject to a greater political competition tend to disseminate more financial information, since this information can be used as a tool for public discussion of their performance. Thus, we present the following hypothesis:

H<sub>2</sub> – “There is a positive association between the political competition and the disclosure index of economic and financial information through the Internet”.

The agency theory leads us to refer that the manager/mayor tries to maximize their well-being. Thus, this can be one of the reasons that motivates them to decide the type of information they should disseminate in order to achieve their objectives. The signaling theory suggests that due to the asymmetric information, the citizen can only evaluate the public management through the information disseminated by the mayor and this will tend to increase the level of financial disclosure, signaling positive aspects which lead to a positive assessment of their performance.

After the emergence of Information and Communication Technologies, namely the Internet, we have seen a change in the disclosure and access to information. The Internet can be currently considered one of the major sources of information. With the development of the Internet a new area of study named Webometrics emerged. According to Björneborn e Ingwersen (2004), Webometrics is the science which intends to obtain information through measuring a number of aspects of the Internet. Within this area of study we find Web Visibility<sup>9</sup>, which can be defined as “*the measure of visibility of a certain website on the Internet*” (Klinger, Lima e Oliveira, 2011).

There are some known studies about the visibility of the Internet directed to universities, where a ranking web is established, as we can confirm in Aguillo, Granadino, Ortega e Prieto (2006), Klinger (2011) and Klinger *et al.* (2011).

Although the studies mentioned in the literature review have not tried to relate this variable, only the impact of the press, we acknowledge that towards the technological developments and towards the projection of the Internet and the way the disclosure of financial information is currently seen, it makes sense to test whether the visibility of a local authority’s website influences the level of disclosure. We believe mayors use the local authority’s website to become closer to citizens. Taking the referred reasons into account, we consider hypothesis H<sub>3</sub>.

H<sub>3</sub> – “There is a positive association between the visibility of a website and the disclosure index of economic and financial information through the Internet”.

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<sup>9</sup> Visibility of the Internet.

## **Description of data, variables and methodology**

### ***Description of data***

The data aiming the estimation of disclosure index were collected from the websites of local authorities, more precisely city councils (there are 308 local authorities in Portugal). The direct visit to the websites for the year 2012 took place between 25<sup>th</sup> June and 21<sup>st</sup> July 2012, for the year 2013 took place between 10<sup>th</sup> July and 18<sup>th</sup> July 2013 and for the 2014 took place between 18<sup>th</sup> December 2014 and 25<sup>th</sup> January 2015 and intended to verify, for each local authority, whether each item included in the index is disseminated.

The data for the calculation of the variable size were obtained from **Carvalho, Fernandes, Camões e Jorge (2012)**.

To calculate the variable political competition, the data were collected from <http://www.marktest.com/> related to the local elections of 2009 and from <http://www.dgai.mai.gov.pt/?area=103&mid=001&sid=003&ssid=002> related to the local elections of 2013.

To collect the data for the calculation of the variable website visibility we used the tool available in <https://www.freegrader.com>, which calculates the level of web visibility of a local authority's website. The visit for the year 2012 took place on 8<sup>th</sup> September 2012, for the year 2013 in 20<sup>th</sup> August 2013 and for the year 2014 in 4<sup>th</sup> February 2015.

The data for the calculation of the variable natural logarithm of total assets average and for the calculation of the average of total revenues per capita were collected from the balance sheet and the budget implementation report of revenues, respectively, and were made available by the Center for Accounting and Taxation Research of Management School of Polytechnic Institute of Cávado and Ave.

### ***Description and calculation of the variables***

#### ***Disclosure index***

Considering the literature review, we created a disclosure index, presented in Table 1, which comprises 3 dimensions: Dimension 1 (DIM<sub>1</sub>): information content; Dimension 2 (DIM<sub>2</sub>): information qualitative characteristics and Dimension 3 (DIM<sub>3</sub>): design, usability and accessibility of the website. For dimension 1, 3 subdimensions were considered: information

about estimates; information about budget implementation reports and information related to other financial statements, and for dimension 3, 4 subdimensions were used: number of clicks to access financial information; file format, which contains the information; terms used on the website for financial information; aggregated/separate information.

Table 1 - Items which make up the disclosure index

<b>Dimension 1 Information content</b>		<b>35 points</b>
<b>Subdimensions</b>	Estimates	8 points
	Year n budget	1 or 0
	Year n GOP - (Major Planning Options) (PPI - (Multi-annual Investment Plan) + MRA - (Most Relevant Activities)	1 or 0
	Year n-1 budget	1 or 0
	Year n-1 GOP (PPI+MRA)	1 or 0
	Year n-2 budget	1 or 0
	Year n-2 GOP (PPI+MRA)	1 or 0
	Year n-3 budget	1 or 0
	Year 2009 GOP (PPI+MRA)	1 or 0
	Budget implementation (control) reports	12 points
	Year n-1 budget implementation	1 or 0
	Year n-1 GOP implementation	1 or 0
	Year n-1 suspense accounts	1 or 0
	Year n-2 treasury operations	1 or 0
	Year n-2 budget implementation	1 or 0
	Year n-2 GOP implementation	1 or 0
	Year n-2 suspense accounts	1 or 0
	Year n-2 treasury operations	1 or 0
	Year n-3 budget implementation	1 or 0
	Year n-3 GOP implementation	1 or 0
	Year n-3 suspense accounts	1 or 0
	Year n-3 treasury operations	1 or 0
	Other financial statements	15 points
	Year n-1 balance sheet	1 or 0
	Year n-1 income statement	1 or 0
	Year n-1 cash-flow statement	1 or 0
	Annex to the balance sheet and year n-1 income statement	1 or 0
	Year n-1 management report	1 or 0
	Year n-2 balance sheet	1 or 0
	Year n-2 income statement	1 or 0
	Year n-2 cash-flow statement	1 or 0
	Annex to the balance sheet and year n-2 income statement	1 or 0
	Year n-2 management report	1 or 0
	Year n-3 balance sheet	1 or 0
	Year n-3 income statement	1 or 0
Year n-3 cash-flow statement	1 or 0	
Annex to the balance sheet and year n-3 income statement	1 or 0	
Year n-3 management report	1 or 0	
<b>Dimension 2: Information qualitative characteristics</b>	<b>6 points</b>	
Comparability	2 or 0	
Timely	2 or 0	
Complete	2 or 0	
<b>Dimension 3: Design, usability, accessibility of the website</b>	<b>8 points</b>	
Number of clicks to access financial information	2 points	
1	2	
2	1	
3	0.75	
Over 3	0.25	
Not named	0	
Format of the file which contains the information	2 points	
Non-convertible ( <i>pdf</i> )	2	
Convertible ( <i>excel, word, html, online</i> )	1	
Not named	0	
Terms used on the website for financial information	2 points	
Presentation of accounts	2	
Financial information	1	
Financial statements	0.75	
Others	0.25	
Not named	0	
Aggregated/separate information	2 points	
Separate	2	
Aggregated	1	
<b>DI total score (DI-Total)</b>	<b>49 points</b>	

Considering these dimensions, we calculated the indices of partial disclosure the following way:

$$Dim_{1it} = \frac{\sum_{Dc=0}^{35} Dc_{it}}{35} \times 100 \quad (1)$$

In which:

$Dim_{1it}$  - financial information disclosure index, of local authority  $i$ , for dimension 1 at the moment  $t$ ;  
 $Dc_{it}$  - points obtained, by local authority  $i$  for each item included in dimension 1 at the moment  $t$ .

$$Dim_{2it} = \frac{\sum_{Dq=0}^6 Dq_{it}}{6} \times 100 \quad (2)$$

In which:

$Dim_{2it}$  - financial information disclosure index, of local authority  $i$ , for dimension 2 at the moment  $t$ ;  
 $Dq_{it}$  - points obtained, by local authority  $i$  for each item included in dimension 2 at the moment  $t$ .

$$Dim_{3it} = \frac{\sum_{Dd=0}^8 Dd_{it}}{8} \times 100 \quad (3)$$

In which:

$Dim_{3it}$  - financial information disclosure index of local authority  $i$ , for dimension 3 at the moment  $t$ ;  
 $Dd_{it}$  - points obtained, by local authority  $i$ , for each item included in dimension 3 at the moment  $t$ .

$$FIDIndex_{it} = Dim_{1it} + Dim_{2it} + Dim_{3it} \quad (4)$$

In which:

$FIDIndex_{it}$  - financial information disclosure index of local authority  $i$  at the moment  $t$ ;  
 $Dim_{1it}$  - financial information disclosure index of local authority  $i$ , for dimension 1 at the moment  $t$ ;  
 $Dim_{2it}$  - financial information disclosure index of local authority  $i$ , for dimension 2 at the moment  $t$ ;  
 $Dim_{3it}$  - financial information disclosure index of local authority  $i$ , for dimension 3 at the moment  $t$ .

For information collection aiming the index calculation, we followed the following steps. First, we identified the websites of local authorities, making use of Google research tools. After identifying all the websites, we visited the website of each local authority and proceeded with the analysis and information collection, what allowed us to award points indentified in Table 1.

## *Size*

For the calculation of the variable size, García e García (2008) and Gandía e Archidona (2008) based on the number of inhabitants per municipality. In this study, we used the same criteria.

## *Political Competition*

Regarding the political competition we used the measure proposed by Laakso e Taagepera (1979) which is often used in political literature as it is considered a good proxy for political competition. Thus:

$$PolComp_{it} = \frac{1}{\sum s_{it}^2} \quad (5)$$

In which:

$PolComp_{it}$  - political competition index of local authority  $i$  at the moment  $t$ .

$s_{it}$  - fraction of votes obtained by party  $i$  in an election time at the moment  $t$ .

As Taagepera (2002) refers, this ratio shows, on average, the number of parties present in the political market. However, when a political party holds the majority, it has to be complemented with the inverse of majority.

## *Website Visibility*

Like we say before, for the calculation of the variable website visibility, we used the tool available on the website <https://www.freegrader.com>, typing the local authority's  $i$  URL in order to obtain a website visibility indicator.

Even though there are more calculation options for the variable website visibility, we chose to use this tool as it is a free and it checks a website for mobile, social, and Search Engine Optimization (SEO) elements. We should consider that the acquisition of visibility indicators of a website, which should have been collected during a certain period to allow the assessment of their time behaviour, obtained in real time are little rigorous but serve the purpose of this paper. In order to obtain the visibility indicator, this tool will analyse your website and provide you with an overall score between 0 and 100.

### *Natural logarithm of total assets*

We used the natural logarithm of simple arithmetic average of the total asset collected from the balance sheet of each local authority.

### *Average of total revenue per capita*

After collecting the net revenue data of each local authority from the revenue budget implementation, the simple arithmetic average was calculated and divided by the number of inhabitants in that municipality.

## ***Methodology***

The hypotheses were tested considering the following model as a basis *cross-section* regression:

$$FIDIndex_{it} = \alpha + \beta_1 Size_{it} + \beta_2 PolComp_{it} + \beta_3 WebVisib_{it} + \beta_4 LnTA_{it} + \beta_5 NetRev_{it} + \varepsilon_{it} \quad (6)$$

In which:

- $FIDIndex_{it}$  - financial information disclosure index – calculated according to formula (4);
- $\alpha$  - constant;
- $Size_{it}$  - number of inhabitants in local authority  $i$  at the moment  $t$ ;
- $PolComp_{it}$  - political competition – calculated according to formula (5);
- $WebVisib_{it}$  - website visibility – calculated according to tool <https://www.freegrader.com/>;
- $LnTA_{it}$  - natural logarithm of local authority's total assets average  $i$  (control variable) at the moment  $t$ ;
- $NetRev_{it}$  - average net revenue per capita of local authority  $i$  (control variable) at the moment  $t$ ;
- $\varepsilon_{it}$  - random error (residues).

As we expect that the level of scrutiny by the ones who are interested in the information disseminated by the local authorities is different according to the size of the municipality, and considering that the bigger it is, the more scrutiny it is subjected to, we also expect that the variable  $Size_{it}$  shows a positive sign.

Regarding the political competition, as the expectation relies on the higher the political competition, the more the propensity to disseminate financial information, namely due to the fact that the scrutiny applied by the political parties can be higher, we expect the variable  $PolComp_{it}$  to have a positive sign.

About the website visibility, we expect a positive association between this variable and the financial disclosure index. We thus expect a positive sign for variable  $WebVisib_{it}$ .



We don't have expectations regarding the signs of variables  $LnTA_{it}$  and  $NetRev_{it}$  as they are used as control variables.

## Result analysis

### Disclosure index

The results concerning the visit to the local authorities' websites, for dimension 1 - "Information content", are stated in Table 2. In this table the averages of the various subdimensions of dimension 1 are also identified. These include estimates, budget implementation reports, and other financial statements. In Table 3 we listed the local authorities with disclosure indices of 0% and 100% in dimension 1.

In Table 2, when analyzing the percentage of dimension 1: "Information content", we can see that 57.14%, 60.39% and 53.90% of the local authorities, respectively for year 2012, 2013 and 2014 disseminate financial information. From the subdimensions presented, the one which shows the highest average percentage of disclosure with 75.49% for year 2012, 75.97% for year 2013, and 85.06% for year 2014 is related to the subdimension estimates. This may reflect the past when the presentation of accounts was limited to the cash basis or the need to disseminate the estimates as a way to signal the mayor's options regarding the use of resources. This concern is in a certain way confirmed on verifying that the disclosure average of estimates from 2009 to 2011 is 71%, from 2010 to 2012 is 78.46% and from 2011 to 2013 76.95%.

Table 2 - Average of dimension "Information content" and its subdimensions

	Subdimension												Dimension 1:		
	Estimates						Budget implementation reports			Other financial statements			Information content		
	2009-11	2010-12	2011-13	2012	2013	2014	2009-11	2010-12	2011-13	2009-11	2010-12	2011-13	2009-11	2010-12	2011-13
Average in %	71.00	78.46	76.95	75.49	75.97	85.06	55.90	57.47	63.69	70.26	71.80	78.18	68.16	70.93	72.69
No. of local authorities															
If > average	164	199	196	218	222	246	156	167	175	164	168	170	176	186	166
%	53.25	64.61	63.64	70.78	72.08	79.87	50.65	54.22	56.82	53.25	54.55	67.53	57.14	60.39	53.90
If < average	144	109	112	90	86	62	152	141	133	144	140	100	132	122	142
%	46.75	35.39	36.36	29.22	27.92	20.13	49.35	45.78	43.18	46.75	45.45	32.47	42.86	39.61	46.10

This subdimension is followed by the one which is related to other financial statements with an average disclosure of 70.26% in 2012, 71.80% in 2013 and 78.18% in 2014 and then

the subdimension related to the budget implementation reports with an average disclosure of 55.90% in 2012, 57.47% in 2013 and 63.69% in 2014.

Table 3 allows us to verify that relatively to dimension “Information content”, 13 local authorities for the year 2011, 11 for the year 2012 and 17 for the year 2013 do not disseminate any item of the index. We also can verify that 52 local authorities for the year 2011, 47 for the year 2012 and 98 for the year 2013 disseminate on their websites 100% of the considered items in dimension “Information content”.

The same table allows us to refer that 218 local authorities disseminate the two estimates of 2012, what represents 70.78% of the population, 222 local authorities disseminate the two estimates of 2013, what represents 72.08% of the population and 246 local authorities disseminate the two estimates of 2014, what represents 79.87% of the population.

Table 3 - Local authorities with disclosure indices of 0% and 100% in dimension - “Information content”

	Subdimension												Dimension 1:		
	Estimates						Budget implementation reports			Other financial statements			Information content		
	2009-11	2010-12	2011-13	2012	2013	2014	2009-11	2010-12	2011-13	2009-11	2010-12	2011-13	2009-11	2010-12	2011-13
No. of local authorities with % = 0	33	20	31	61	62	30	32	25	29	26	19	24	13	11	17
in %	10.71	6.49	10.06	19.81	20.13	9.74	10.39	8.12	9.42	8.44	6.17	7.79	4.20	3.57	5.52
No. of local authorities with % = 100	155	188	192	218	222	246	65	63	114	118	115	170	52	47	98
in %	50.32	61.04	62.34	70.78	72.08	79.87	21.10	20.45	37.01	38.31	37.34	55.19	16.90	15.26	31.82

The checked items referred in Table 4 will be used to show whether mayors are giving true importance to the disclosure of complete, comparable and timely financial information.

We consider that the information disseminated is complete when the local authorities disseminate all the information required by OAPLA and by the Law of Local Finance (number of items comprised in the disclosure index) and consider as timely information, the one which is timely provided. We consider the information comparable when the local authorities disseminate information relatively to the last two years (point of reference of our study – 2012, 2013 and 2014).

Table 4 - Disclosure of complete, comparable and timely information

Complete	Timely	Estimates
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Comparable	Year n budget
	Year n GOP (PPI+MRA)
	Year n-1 budget
	Year n-1 GOP (PPI+MRA)
	Year n-2 budget
	Year n-2 GOP (PPI+MRA)
	Year n-3 budget
	Year n-3 GOP (PPI+MRA)
	<b>Budget implementation reports</b>
	Year n-1 budget implementation
	Year n-1 GOP implementation
	Year n-1 suspense accounts
	Year n-1 treasury operations
	Year n-2 budget implementation
	Year n-2 GOP implementation
	Year n-2 suspense accounts
	Year n-2 treasury operations
	Year n-3 budget implementation
	Year n-3 GOP implementation
	Year n-3 suspense accounts
	Year n-3 treasury operations
	<b>Other financial statements</b>
	Year n-1 balance sheet
	Year n-1 income statement
	Year n-1 cash-flow statement
	Annex to balance sheet and income statement of n-1
	Year n-1 management report
	Year n-2 balance sheet
Year n-2 income statement	
Year n-2 cash-flow statement	
Annex to balance sheet and income statement of n-2	
Year n-2 management report	
Year n-3 balance sheet	
Year n-3 income statement	
Year n-3 cash-flow statement	
Annex to balance sheet and income statement of n-3	
Year n-3 management report	

OAPLA determines that the estimates documents to adopt by all local authorities are the Budget and the Major Planning Options. Thus, taking the referred in the last paragraph into consideration, the estimates information, in our view, should be disseminated in the beginning of the year, as OAPLA refers that “*local authorities publicize up to 30 days after appreciation and approval by the governing body*”. The estimates documents must be approved by the governing body, generally in the last ordinary session in the year before the one it relates to, during November and December, in order to come into force on 1<sup>st</sup> January of each year, according to Law No. 169/99, of 18/09. As our visit took place between 25<sup>th</sup> June and 21<sup>st</sup> July 2012, for the year 2013 took place between 10<sup>th</sup> July and 18<sup>th</sup> July 2013 and for the year 2014 took place between 18<sup>th</sup> December 2014 and 25<sup>th</sup> January 2015, we consider that the information should have been disseminated on the website of each local authority.

From the analysis to Table 5 related to dimension 2 - “The information qualitative characteristics”, and based on the previously referred, we could verify that 55 local authorities disseminate comparable information in year 2012 - 17.86% of the population, 51 local authorities disseminate comparable information in year 2013 - 16.56% of the population and 101 local authorities disseminate comparable information in year 2014 - 32.79% of the

population. Only 52 out of 55 local authorities disseminate complete information, in year 2012 what shows a percentage of 16.9%. In year 2013 only 47 out of 51 local authorities disseminate complete information, what shows a percentage of 15.26%. Finally in the year 2014, 98 out of 101 local authorities disseminate complete information, what shows a percentage of 31.82%. The analysis to Table 5 allows us to confirm that 218 local authorities disseminate timely information in year 2012, what represents 70.78% of the population. In the year 2013 222 local authorities disseminate timely information, what represents 72.08% of the population and in the year 2014 246 local authorities disseminate timely information, what represents 79.87% of the population.

In face of these results, we can observe that over time there was an increase in the quality of information that is disclosed.

Table 5 - Information related to dimension 2 - “Information qualitative characteristics”

Information	No. of local authorities			%		
	2009-11	2010-12	2011-13	2009-11	2010-12	2011-13
Complete	52	47	98	16.90	15.26	31.82
Comparable	55	51	101	17.86	16.56	32.79
Timely	218	222	246	70.78	72.08	79.87

In the light of the above, we verified that not all mayors give importance to the disclosure of complete, comparable and timely financial information.

In Table 6 we show information about Dimension 3: “Design, usability and accessibility of the website”. We highlight that the counting of clicks needed to access to financial information is done from the main page of each local authority’s website, until the file which contains financial information is opened. It should also be noted that this counting is done after indentifying the area, and not the number of clicks in the initial search, where many times it was needed to make use of the site map to find the financial information.

We confirmed that on average 3.51, 3.39 and 3.48 clicks are needed to open the files containing the financial information disseminated on the website, respectively in 2012, 2013 and 2014. We understand the fact that for most local authorities 208 in 2012, 178 in 2013 and 187 in 2014 3 to 4 clicks are needed, as this is closer to the average number of clicks.

According to the previously referred, although the average number of clicks is relatively low, it does not represent the effective number of clicks needed in the search for financial information, as there is no specific area and the terms used are very disparate. Therefore, we consider that there is no easy access to information by the ordinary user.

Still according to Table 6 we can conclude that only 11 local authorities in 2012, 17 in 2013 and 29 in 2014 make files with a format that allows extracting the available information. The remaining local authorities disseminate information in files with format “.pdf”, many times protected or scanned documents, what hinders or even prevents the data extraction or processing. Lourenço *et al.* (2010) verified that, with exception to an item in a city council, which is shown in *html*, all the information is made available through PDF documents.

Table 6 - Information related to Dimension 3 - “Design, usability and accessibility of the website”

Number of clicks	No. of local authorities			%		
	2012	2013	2014	2012	2013	2014
1	3	0	1	0.97	0	0.32
2	37	52	41	12.01	16.88	13.31
3	118	89	93	38.31	28.90	30.19
Over 3	136	149	156	44.16	48.38	50.66
N/A	14	18	17	4.55	5.84	5.52
Average	3.51	3.39	3.48			
File format	No. of local authorities			%		
	2012	2013	2014	2012	2013	2014
Non-convertible ( <i>pdf</i> )	281	275	262	91.23	89.29	85.06
Convertible( <i>excel, word, html, online</i> )	11	17	29	3.57	5.52	9.42
N/A	16	16	17	5.19	5.19	5.52
Terms used on the website for financial information	No. of local authorities			%		
	2012	2013	2014	2012	2013	2014
Presentation of accounts	29	41	48	9.42	13.31	15.58
Financial information	28	33	41	9.09	10.71	13.30
Financial statements	39	41	27	12.66	13.31	8.77
Others	198	192	175	64.29	62.34	56.81
Not named	14	18	17	4.55	5.84	5.52
Disseminated information	No. of local authorities			%		
	2012	2013	2014	2012	2013	2014
Separately	168	147	140	57.55	47.73	45.45
Aggregated in only 1 file	127	134	139	41.23	43.51	45.13
N/A	13	27	29	4.22	8.76	9.40

Remarks:

- a) N/A - Not applicable.

When we started the visit to the local authorities’ websites, we experienced a great difficulty in finding out the area where the financial information was made available, as there was neither a standard for the term to identify this area nor a specific and easily identified area. As we can conclude from an analysis to Table 6 the phrases used by the local authorities for the disclosure of the financial information are very disparate. From a total number of local authorities, 39 in 2012, 41 in 2013 and 27 in 2014 use the phrase “*financial documents*”, 29 in 2012, 41 in 2013 and 48 in 2014 opt for “*presentation of accounts*” and 28 in 2012, 33 in 2013 and 41 in 2014 use “*financial information*”, all the other local authorities use phrases which, although common to some of them, are rarely used. The phrases used by some local authorities are rather dissimilar, such as “*institutional information*”, “*compulsory documentation*”, “*municipal governance*”, “*various documents*” or “*Spotlight*”, phrases which give no clue to financial information.

The analysis to Table 6 allows us to verify that in the year 2012 168 local authorities disseminate information separately, in 2013 only 147 and in 2014 only 140 local authorities. It should be highlighted that although the information is not disseminated separately, in some cases, the terms used in files do not make the content of each document clear. The information disseminated on the websites is made available in a unique file by 127 local authorities in 2012, by 134 local authorities in 2013, and by 139 local authorities in 2014. This is troublesome when it comes to consulting documents, as it is necessary to download a large file (in some cases with 295Mb) in order to have access to information. There is a local authority which disseminates the information of 2010 in 295 files (number of pages of management report).

According to the results and to what we have been stating throughout this section, we can conclude that not all local authorities disseminate all the financial information required by law on the websites. In addition, the information disseminated varies from local authority to local authority. From the result analysis it is also seen that there is no specific area for the disclosure of financial information on the websites and that the phrases used by the local authorities are very disparate. In addition, the information cannot be easily accessed and it is very often available in formats which do not allow the extraction of information.

Finally, the disclosure index calculated according to formula (4) shows an average of 60.37% in 2012, 61.87% in 2013 and 67,32% in 2014<sup>10</sup>.

### ***Hypotheses test***

The results of multiple regression analysis are presented in Table 7. From model (6), which we named as model F, we considered in this analysis other five models, as we tried to understand which one had a greater explanatory power. Thus, in model A we only considered variables  $Size_{it}$ ,  $PolComp_{it}$ . In model B we considered variables  $Size_{it}$ ,  $PolComp_{it}$  and the control variables  $LnTA_{it}$  and  $NetRev_{it}$ . In model C we only considered variables  $Size_{it}$ ,  $PolComp_{it}$  and  $WebVisib_{it}$ . In model D we only considered variables  $Size_{it}$ ,  $PolComp_{it}$  and  $WebVisib_{it}$  and the control variable  $LnTA_{it}$  and finally in model E we only considered variables  $Size_{it}$ ,  $PolComp_{it}$  and  $WebVisib_{it}$  and the variable of control  $NetRev_{it}$ .

In each model the Adjusted  $R^2$  is very low, what indicates a reduced consistence of the models. Models in which  $R^2$  shows the highest values are models B, D and F. However, we

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<sup>10</sup> Value multiplied by 100 to get a percentage.

verified that Statistics F is presented in every model as statistically significant, showing a statistical significance level<sup>11</sup> of 1% in models B, D and F, 5% in models A and C and a significance level of 10% in model E.

The results in model A make it possible to verify that variable  $Size_{it}$  has a statistical significance level of 1% and a positive sign, what meets the expected. We verified that in model B the control variable  $NetRev_{it}$  has a statistical significance level of 1%, the significance level of the statistical variable  $Size_{it}$  turns to be 10%, being the sign kept positive.

Table 7 - Results of multiple regression models

Independent variables	Expected sign	Model A	Model B	Model C	Model D	Model E	Model F
		Coefficient (t-statistic)	Coefficient (t-statistic)	Coefficient (t-statistic)	Coefficient (t-statistic)	Coefficient (t-statistic)	Coefficient (t-statistic)
$Const$		0,633 (23,889)***	0,975 (3,929)***	0,648 (21,987)***	0,714 (20,247)***	0,714 (3,004)**	0,993 (3,993)***
$Size_{it}$	+	0,000 (2,635)***	0,000 (1,834)*	0,000 (2,631)***	0,000 (1,450)	0,000 (2,103)**	0,000 (1,840)*
$PolComp_{it}$	+	-0,006 (-0,558)	-0,011 (-0,924)	-0,007 (-0,621)	-0,012 (-1,027)	-0,007 (-0,602)	-0,011 (-0,985)
$WebVisib_{it}$	+			-0,000 (-1,186)	-0,000 (1,168)	-0,000 (-1,188)	-0,000 (-1,178)
$LnTA_{it}$			-0,015 (-1,124)			-0,004 (-0,278)	-0,015 (-1,135)
$NetRev_{it}$			-0,000 (-3,582)***		-0,000 (-3,403)***		-0,000 (-3,576)***
Adjusted R <sup>2</sup>		0,005	0,017	0,006	0,017	0,005	0,017
Statistics F		3,496**	4,993***	2,800**	5,019***	2,117*	4,274***

Remarks:

- \*\*\* Significance level of 1%; \*\* Significance level of 5% and \*Significance level of 10%;
- Dependent variable  $FIDIndex_{it}$ .

Model C results from adding the variable  $WebVisib_{it}$  to model A. In this model, variable  $Size_{it}$  shows a positive sign and a significance level of 1%.

Models D, E and F are originated from model C, in which the control variables are included. If to model C we add variable  $NetRev_{it}$  (model D), we verify that the results indicate a statistical significance level of 1% for variable  $NetRev_{it}$  and a negative sign, just as in model B. It is to highlight that in this model, Statistics F shows a statistical significance level of 1%.

<sup>11</sup> The significance level indicates the likelihood to reject the true hypothesis.

On the other hand, if to model C we add variable  $LnTA_{it}$  (model E), ensues a model in which the results indicate that the statistical significance level of variable  $Size_{it}$  is 5%, decreasing the statistical significance level relatively to model C and keeping the sign positive.

The estimation results of model F, resulting from the use of all independent variables and the addition of two control variables, indicate that variables  $Size_{it}$  is statistically significant to 10%, keeping the sign, and variable  $NetRev_{it}$  statistically significant to 1%, also presenting the negative sign.

In general, the results of the regression analysis indicate that variable  $Size_{it}$  has influence on the information disclosure index, as this variable is statistically significant in all presented models. The statistical significance level for variable  $Size_{it}$  is 1% in models A and C, 5% in model E and 10% in models B and F. Variable  $PolComp_{it}$  is statistically non significant in all models. We also confirmed that the control variable  $NetRev_{it}$  has a statistical significance level of 1% and a negative sign in all models in which it was included. This fact indicates that the level of revenues of local authorities has a negative influence on the financial information disclosure index through the Internet.

Thus, considering the results, we corroborate hypothesis  $H_1$ , as in all models presented, except C, the results indicate that variable  $Size_{it}$  is positively related to the disclosure index of economic and financial information done through the Internet and Statistics F is statistically significant in all models. García e García (2008), Gandía e Archidona (2008) and Álvarez *et al.* (2010) came to a similar conclusion.

As for variable  $WebVisib_{it}$ , it did not prove significant. Thus, it cannot be considered an explanatory factor of information disclosure.

According to results stated, it is possible to identify the size as factor that influence the disclosure level, corroborating hypotheses  $H_1$ .



## Conclusions

This paper intends to address to the issue regarding **the level of disclosure of financial information via the Internet and the factors that influence the local authorities in Portugal on this disclosure.**

The work carried out relied on the assumptions of the agency theory, the public choice theory and the signaling theory, and the results are consistent with the assumptions of these theories. The results obtained from the multiple regression analysis corroborated the hypotheses that the size influence the disclosure level of financial information via the Internet.

This study showed that finding financial information in a website is difficult and time-consuming and, in addition, made it possible to pinpoint a great number of local authorities that do not disseminate the financial information required by law on their websites. Hence, this can condition the possibility of a number of users, namely citizens, to evaluate the efficiency and effectiveness of public resources management and consequently, to evaluate the mayors' responsibility. The difficulty to attain financial information through the Internet can still be considered a factor that hinders the transparency of local authorities' management.

Considering all the results obtained, it seems that local mayors are not very aware of using the local authorities' websites to improve accountability.

Following this work, it would be interesting to study if the level of financial information disseminated on the websites has an impact on the reelection of the mayor.

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